



New York and  
Long Island  
Field Offices

Strategic Plan

FY2011



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**U.S. Fish and Wildlife Service**

**New York and Long Island Field Offices**

**Strategic Plan Introduction**

The U.S. Fish and Wildlife Service is evolving its landscape level approach to conservation. Like many of our conservation partners, there is a realization that, with the increasing numbers of species being designated as species of greatest conservation need, or have been Federally- or State-listed as threatened or endangered, that we must approach their recovery in a more holistic manner at the same scale they occur, a landscape scale. Working at a landscape scale requires working across political jurisdictions and with our many conservation partners; it requires an integration of efforts with each organization contributing within the scope of its mission.

The New York and Long Island Field Offices have developed a strategic plan for our future work. This plan provides the direction of our field offices' work and allows us to clearly articulate to others what our goals are and why. Our plan was developed using the Strategic Habitat Conservation approach (SHC). The SHC approach is an adaptive management methodology with 4 identifiable phases – biological planning, conservation design, conservation implementation, and monitoring. You will see that our strategic plan reflects this process in its construction.

During the biological planning phase, our office identified 8 geographic focal areas within New York that support concentrations of species of greatest conservation need or were important for the future of the species within their current or potential future range as modified by climate change. Forty-one priority representative species were selected. We identified and ranked threats, and identified population goals for these species. In the conservation design phase, we identified strategies to attain our population goals by determining ways to mitigate the threats having the greatest impact on the species. Monitoring will be done to determine if our strategies are successful or need to be modified.

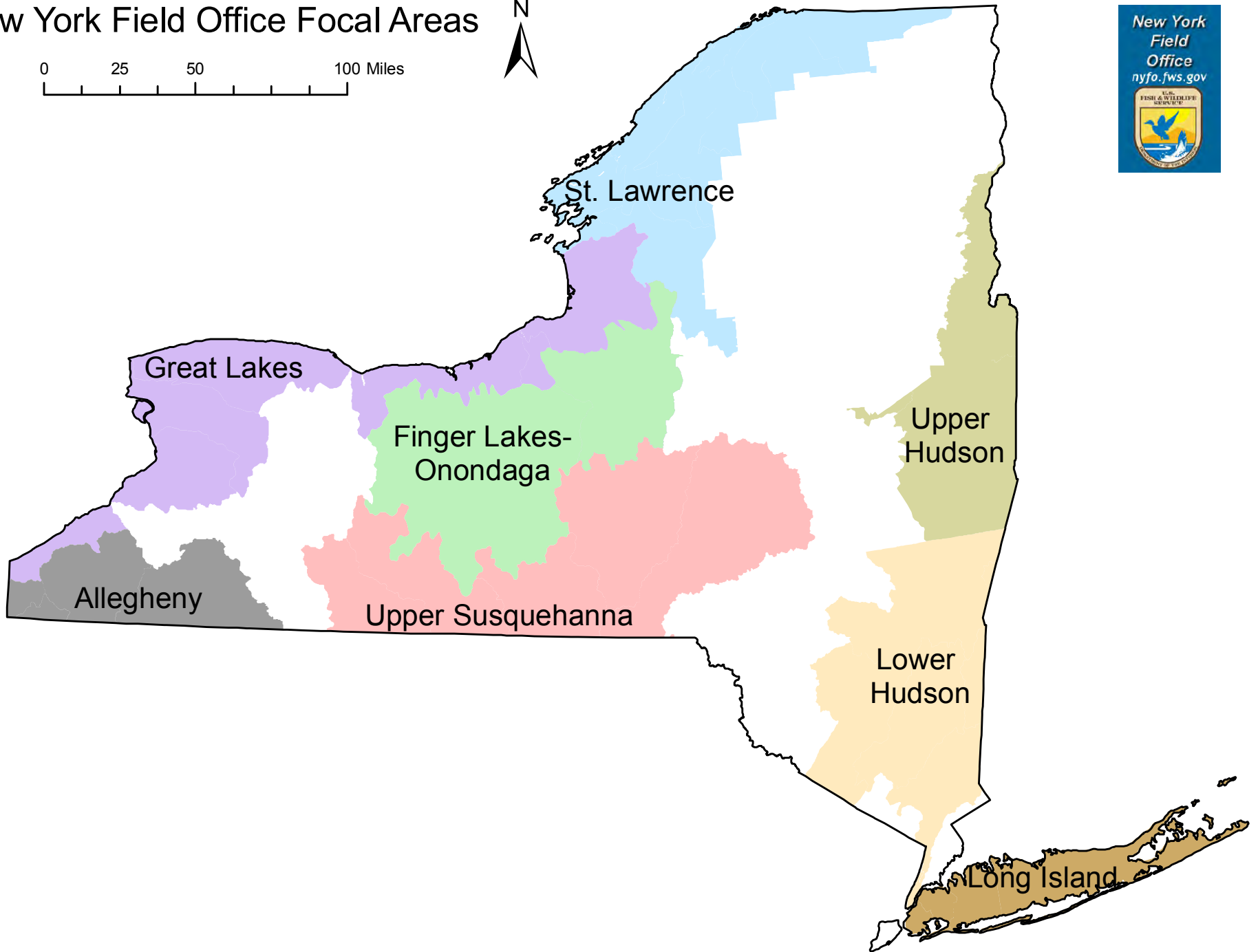
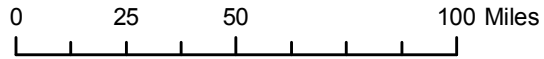
The timeline over which this plan will be implemented is biologically based, that is, our planning timeframe will be consistent with the timeline it will take to reach the specific goal we have identified. We are taking the long view.

Every fiscal/performance year we will identify those actions from our plan we are committing to undertake. Those actions will constitute our annual work plan. You will see those actions identified within the document in blue text. For convenience they are also extracted from the text and placed in appendices organized by office program and by species.

Our plan is a living document. Using an adaptive management strategy means we will modify the plan as appropriate as we coordinate with our conservation partners, evaluate new

information and our monitoring results, and take stock of the resources available to us for implementation. We strive to improve the delivery of conservation in the most effective and efficient means possible. We are very interested in your feedback. We encourage those who read this plan to identify where we may have common goals and can work together. If you have information or insights that will help improve our plan, please share those with us. The way to the future is a shared one. We look forward to working with you.

# New York Field Office Focal Areas





## ALLEGHENY FOCAL AREA

The Allegheny Focal Area (AFA) is located in the southwestern corner of New York and contains 1,906 square miles or 3.5% of the state. The overall boundary is demarcated largely by the Allegheny River watershed, which drains into Pennsylvania. From west to east, the AFA transitions from the heavily glaciated Low Lime Drift Plains with a local relief of 250-400 feet to the unglaciated High Allegheny Plateau with a local relief of 500-1000 feet. Overall elevation range within the focal area is 1000-2350 feet. The AFA is characterized by the steep topography and the high overall elevation of the Allegheny Plateau as well as by Chautauqua Lake, the Allegheny Reservoir, and the Allegheny River.

The Allegheny River Basin is one of two principle tributaries to the Ohio River Valley and has historically been one of the most resource rich extractive areas in the United States. All of or portions of three New York counties are included within the AFA boundary including Allegany, Cattaraugus, and Chautauqua. Approximately 190,000 people live within this focal area, concentrated primarily southeast of Chautauqua Lake, including the City of Jamestown and in the Allegheny River Valley, including the City of Olean. Land uses transition from lesser areas of dairy, agriculture, and development to more predominate land uses related to forestry as topography increases.

This focal area was selected because it contains extensive forests as well as high quality aquatic systems. There are currently two Federally-listed species (endangered [E], candidate [C]) and six identified species of concern within the focal area. The heart of this focal area centers on the heavily forested 65,000-acre Allegany State Park, which is surrounded by state and privately-owned forested lands. These areas are important habitat for the cerulean warbler and, along with associated edges and shrublands, broad winged hawk and golden-winged warbler. This focal area is included within Bird Conservation Region 28 (Appalachian) and Partners in Flight Physiographic Area 24 (Allegheny Plateau). The AFA also contains 4,086 miles of freshwater rivers and streams including the French Creek sub-watershed, which is considered the most biologically rich aquatic system in the northeastern United States. The clubshell (E) and rayed bean (C) mussels, as well as the eastern hellbender salamander, are found here, all of which require low sediment, unpolluted streams. Additionally, important fish species, such as the brook trout and spotted darter, occur in the AFA.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with Marcellus shale drilling, oil drilling, water-level regulations, hydropower, wind power, forestry practices, and development. Specific threats include habitat loss (principally), fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, shoreline hardening, degraded water quality, nutrient and sediment loading, and climate change. Current projects include Federal and non-Federal permit review for wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

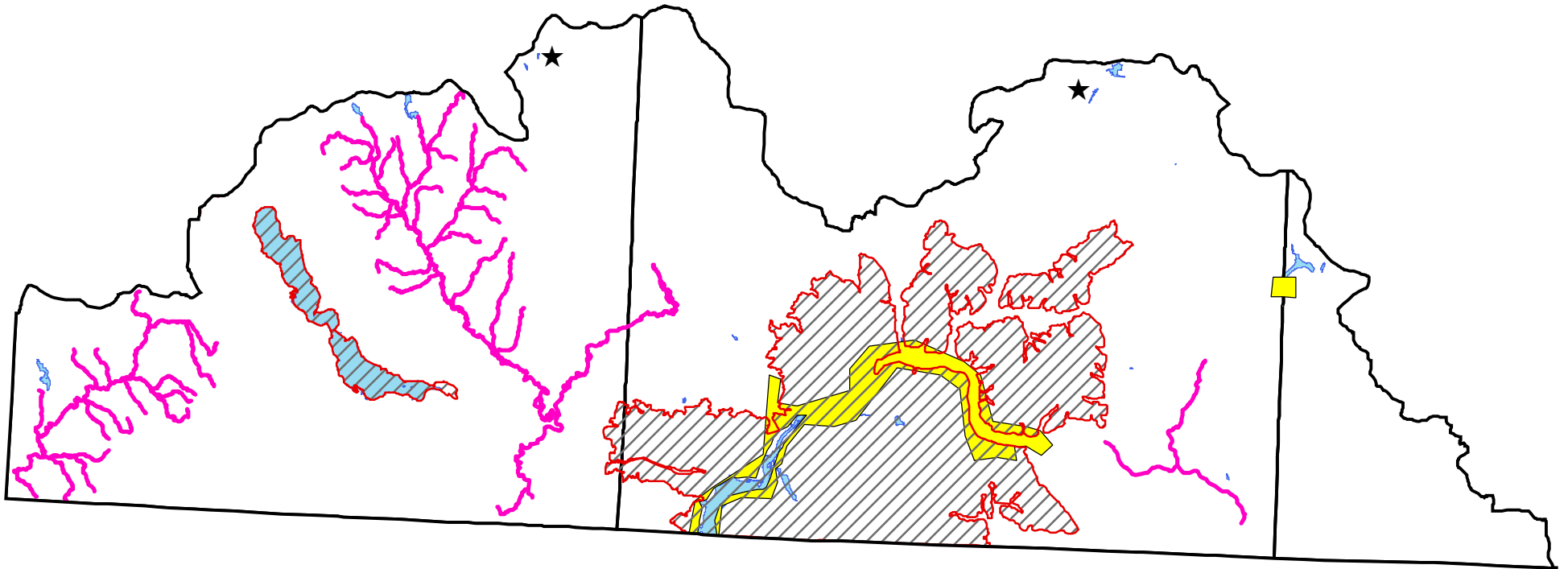
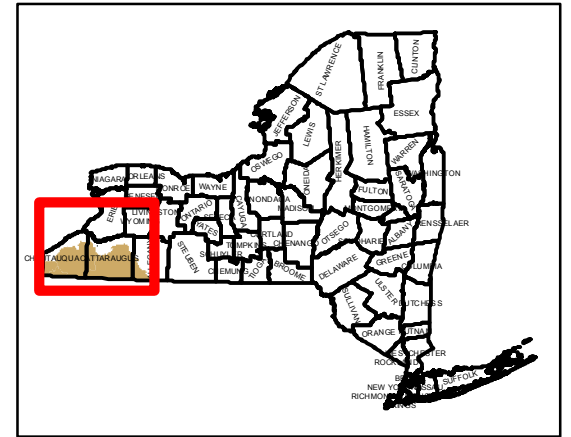


# Allegheny Focal Area

0 5 10 20 Miles



-  Club shell
-  Important bird areas
-  Wind turbines
-  Native American Lands
-  Protected lands
-  Lakes
-  French Creek watershed
-  Allegheny focal area



# Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

## Broad-winged Hawk Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

bald eagle, red-shouldered hawk, red-tailed hawk, turkey vulture, Cooper's hawk, sharp-shinned hawk (buteos and accipiters in general), long-eared owl

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The broad-winged hawk is a small, stocky buteo. It is one of the few North American raptors that flock during migration. It is a common breeder in large deciduous or mixed-deciduous forests throughout northeastern and north central North America (Goodrich et al. 1996). During breeding, the broad-winged hawk is secretive or rather, unobtrusive. It lives mainly in the woods, beneath the canopy or hidden among the foliage. Often one is made aware of it only through its call. Its food consists mainly of snakes, mice, frogs, and insects. Most breeding occurs in Canada, and requires large tracts of forest. Most broad-winged hawks breeding in the eastern United States and southeastern Canada migrate to wintering grounds in southern Central America and central South America (Hawk Mountain 2004). During the migration, the broad-winged hawk is seen in large congregations, and when wind conditions are ripe, form "kettles" of soaring raptors. Birds that congregate in large numbers like this species are vulnerable to catastrophic harm (e.g. if a wind power project were poorly sited in a migratory pathway, collision with a large number of birds possible).

**Justification for species selection:** Broad-winged hawk populations have been decreasing since the 1980s and the species is representative of other migratory raptors. Most raptors are not adequately covered by current monitoring methods, so basic distributions, population estimates, and trend data are lacking for many raptors during the appropriate seasons – breeding, migration, staging, or wintering. Targeted monitoring programs should be established to understand the status of those species that require them, especially if there is evidence that the species has suffered or is suffering either long-term or dramatic population declines. Hawk Mountain broad-winged hawk status report, 2007 ([http://hawkmountain.org/media/broadwingCSR\\_June07.pdf](http://hawkmountain.org/media/broadwingCSR_June07.pdf)).

Prominent spring migration locations occur along the southern shores of Lake Erie and Lake Ontario in New York, which is an area of high potential wind energy development.

Bird Conservation Region (BCR) 28 (Appalachian Mountains) includes the New York portion of the Allegheny Plateau. No population estimates for this species were found for New York's portion of the BCR. Nesting density in western New York reported as 1 pair/2 km<sup>2</sup> (Goodrich et al. 1996). The BCR 13 (Lower Great Lakes/St. Lawrence) population is estimated at 3,000 individuals (in New York).

# **Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area**

**State contribution to overall species population:** Range extends across New York. State estimated population of 32,000 individuals.

## **Threats and threat assessment:**

- 1. Loss of habitat due to development.**
- 2. Fragmentation of habitat** (wind power projects, pipelines, transmission lines along migration corridors, and stop over habitat).
- 3. Collision or habitat loss** from wind energy projects.
- 4. Energy development** (potential – oil and gas drilling, Marcellus shale gas extraction).
- 5. Predation.**
- 6. Changes in habitat community structure** and changes in prey base during breeding and migration seasons, including declines in amphibian populations (National Audubon Society [NAS] 2009).
- 7. Changes in species distribution and population sizes** due to climate change.

## **Research needed:**

- Research is needed to determine climate change impacts on habitat community structure and changes in prey base during breeding and migration seasons.
- Research is also needed to determine changes in species distribution and population sizes due to climate change.
- Research is needed to assess potential impacts of habitat fragmentation associated with Marcellus shale formation gas extraction.

(WHO: U.S. Fish and Wildlife Service [USFWS] Landscape Conservation Cooperatives [LCC] proposal for landscape scale evaluation of this species which is representative of migratory, forest-dwelling raptors)

## *Partners/potential funding:*

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, State University of New York-College of Environmental Science and Forestry (SUNY-ESF), Hawk Migration Association of North America

## ***Population goal(s) for New York State:***

# Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

Maintain/increase basin populations

- Maintain stable populations
- Increase breeding pairs

## Research needed:

- Develop targeted monitoring of population status of forest breeding raptors to establish population goals.
- Conduct studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites, migration areas, preferred foraging areas, and interactions with competitors.

(WHO: landscape scale research by LCC)

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

1. **Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat.
  - a. Prioritize permit review in breeding areas of this species (forests and lakeshore) (Conservation Planning Assistance [CPA]); and influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
  - b. Participate in and support yearly migration monitoring and surveys.
  - c. Prioritize forest habitat enhancement and restoration projects that would benefit this species (Partners for Fish and Wildlife [PFW]).
  - d. Initiate discussions regarding a thorough inventory of potential nest sites and preferred migration and foraging area habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome.
  - e. Work with partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors.
  - f. Use telemetry to monitor distributions and identify essential habitats.
  - g. Analyze existing areas of habitat and recently altered forest landscapes to determine potential breeding areas for this species.

# **Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area**

- h. Obtain breeding bird survey data for this species to focus efforts.
  - i. Create map or shapefile for possible broad-winged hawk sites for all New York Field Office (NYFO) programs.
- 2. Collision or habitat loss** from wind energy projects.
- a. Review wind energy projects to minimize impacts to this species by directing turbine placement away from large tracts of intact forest (CPA).
- 3. Energy development.**
- a. Review energy development projects proposed in large intact blocks of forest habitat and recommend siting adjustments (CPA).
- 4. Predation.**
- a. Additional studies are needed to assess the degree to which predation impacts the species.
- 5. Changes in habitat community structure** and changes in prey base.
- a. Seek to influence regulatory agency decisions by providing input into conservation measures that would minimize impacts of development in forested areas near the lakeshore (CPA).
- 6. Climate change.**
- a. Strategy will depend on results of research need noted above. Seek to influence regulatory agency decisions by providing comments on projects that may result in long-term impacts on habitat structure (CPA).

## *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 – 2012

- 1. Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat.

# Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

- a. Provide substantive Federal agency comments on proposed Federal agency actions (including land development) with likely adverse impacts to this species and/or its habitat (CPA).
  - b. Provide information to the U.S. Army Corps of Engineers (USACE) project managers to convey the importance of maintaining large intact blocks of forest habitat.
  - c. Participate in and support yearly migration monitoring and surveys.
    - i. Participate in Hawk Watch sites/banding stations (Chautauqua Ridge).
    - ii. Support Hawk Watch sites/banding stations (CPA).
  - d. Develop information related to minimizing the impacts of development, land management, and silviculture on forest raptors, and post on NYFO web site.
    - i. Develop fact sheets with best management practices (BMP) to minimize impacts to broad-winged hawks from silvicultural activities, and use these to influence landowners regarding habitat needs of this species and to encourage landowner protection of forests.
- 2. Collision or habitat loss** from wind energy projects.
- a. Provide substantive Federal agency comments on proposed Federal actions regarding wind energy projects to minimize impacts to this species.
    - Coordinate with other offices involved in wind power project siting to assess potential for additive effects to the species in other parts of the species range, including the length of their migratory routes (through Pennsylvania for example) (CPA).
- 3. Energy development.**
- a. Review energy development projects proposed in large intact blocks of forest habitat (CPA).
- 4. Predation.**
- a. No work is planned to address this threat; more information will be available once further studies are conducted.
- 5. Changes in habitat community structure** and changes in prey base.
- a. Seek to influence regulatory agency decisions.

# Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

- i. Seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured (CPA).

## 6. Climate change.

- a. Delivery will depend upon strategy determined from research above.

### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

## OUTREACH

### Potential outreach needs:

- Landowner education
- Public involvement
- Promote wind power traveling exhibit
- Create Fact Sheet
- Meet with non-governmental organizations (NGO) such as Hawk Watch groups, Audubon chapters, etc., to deliver conservation message

### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

## MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future broad-winged hawk population restoration activities.

### *References*

Dettmers, R. and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.partnersinflight.org/bcps/plan/pl\\_15\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf)).



## **Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area**

Goodrich, L.J., S.C. Crocoll, and S.E. Senner. 1996. Broad-winged Hawk (*Buteo platypterus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/218>.

Hawk Mountain. 2004. Broad-winged hawk. <http://hawkmountain.org/media/BWHA.pdf>.

Hawk Mountain. 2007. Broad-winged Hawk Conservation Status Report. [http://hawkmountain.org/media/broadwingCSR\\_June07.pdf](http://hawkmountain.org/media/broadwingCSR_June07.pdf).

National Audubon Society. 2009. Broad-winged hawk: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 8 March 2010. ([http://ny.audubon.org/PDFs/HRVC\\_BROADWINGEDHAWK.pdf](http://ny.audubon.org/PDFs/HRVC_BROADWINGEDHAWK.pdf)).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

Robertson, B. and K.V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003 ([http://www.partnersinflight.org/bcps/plan/pl\\_24\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf)).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

Existing strategies for broad-winged hawk restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003) [http://www.partnersinflight.org/bcps/plan/pl\\_15\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/ St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
- Broad-winged Hawk Conservation Status Report (Hawk Mountain 2007) [http://hawkmountain.org/media/broadwingCSR\\_June07.pdf](http://hawkmountain.org/media/broadwingCSR_June07.pdf).

# Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area

## Brook Trout Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

American eel, American shad, longtail salamander, hellbender, wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow pH range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in pH caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds within the Allegheny River watershed as highest priority for protection of brook trout populations.

**Justification for species selection:** The brook trout is a highly prized native sport fish, but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations, and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

## Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area

**State contribution to overall species population:** Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Allegheny watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

### Research needed:

- A. Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC and Trout Unlimited [TU] to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- B. Determine genetic diversity of brook trout in the watershed

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### Threats and threat assessment:

1. **Loss of habitat and habitat function;** habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

### Research needed:

- Extensive and frequent stream surveys to determine population size.

(Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

- Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

(Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

- Need to locate heritage streams and heritage populations.

(Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

## **Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area**

### **2. Barriers to Migration** (including dams and impassable culverts).

#### **Research needed:**

- Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids

(Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

- Identify which known barriers are having an influence on brook trout distribution

(Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

### **3. Competition from non-native salmonids.**

#### **Research needed:**

- Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

(Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### **4. Climate change; increased water temperatures.**

#### **Research needed:**

- Identification of climate change related impacts to brook trout.

(Who: National Weather Service, LCC, academics; Cost: unknown at this time)

#### *Partners/potential funding:*

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, Allegheny County Soil and Water Conservation District (SWCD), Cattaraugus County SWCD, Chautauqua County SWCD, The Nature Conservancy (TNC), Chautauqua Watershed Conservancy.

#### *Population goal(s) for New York State:*

The EBTJV has numerous conservation goals, including “Conserve, enhance or restore brook trout populations”, and “...to perpetuate and restore brook trout populations throughout their

## **Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area**

historic range”; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Allegheny watershed. Establishing population goals remains a research need.

### **CONSERVATION DESIGN**

#### *Strategies for addressing those threats*

##### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]).
- c. Facilitate habitat preservation through coordination with land trusts.
- d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.
- e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified.
- f. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
- g. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

##### **2. Barriers to migration (including dams and impassable culverts).**

- a. Working with partners, identify and remove barriers.
- b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

## **Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area**

- c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

### **3. Competition from non-native salmonids.**

- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

### **4. Climate change; increased water temperatures.**

- a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

#### *Partner organizations:*

NYSDEC, NYSOPRHP, TU, Allegheny County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
  - i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.
  - ii. Post these fact sheets/BMPs on our website.
  - iii. Writing substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA]).
  - iv. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.
  - v. Provide recommendations on culvert design via CPA review.
  - vi. Develop stream buffer guidelines/BMPs and post on website.

## Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area

- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).
    - i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW).
    - ii. Restoration work on McIntosh Brook, with Lower Great Lakes Fish and Wildlife Conservation Office (LGLFWCO).
  - c. Facilitate habitat preservation through coordination with land trusts or non-governmental organizations (NGO).
  - d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).
    - i. McIntosh Brook project will accomplish this strategy.
    - ii. [Statewide – Conduct a training session for County SWCD staff on natural stream design – PFW – March 2011.](#)
  - e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.
    - i. McIntosh Brook project will accomplish this strategy.
    - ii. [Meet with NYSDEC fisheries biologists to provide technical assistance on proposed and ongoing stream restoration/habitat enhancement work \(PFW\).](#)
- 2. Barriers to migration** (including dams and impassable culverts).
- a. Working with partners, identify and remove barriers.
    - i. No work indentified at this time.
  - b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.
    - i. No work indentified at this time.
  - c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

## **Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area**

- i. No work indentified at this time.
- 3. Competition from non-native salmonids.**
    - a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.
      - i. No work indentified at this time.
- 4. Climate change; increased water temperatures.**
    - a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
      - i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.

### **OUTREACH**

In addition to the web site, there is an EBTJV Google Group (<http://groups.google.com/group/ebtjv>).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of “ongoing activities” on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project – trout in the classroom.

### **MONITORING**

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.
- Establish benchmarks for success based on EBTJV.
- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.



## **Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area**

- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.
- Seek funding and support for monitoring.

### *Partners*

TU, NYSDEC, LGLFWCO

### *References*

Eastern Brook Trout Joint Venture main website (<http://www.westernbrooktrout.org>)

Eastern Brook Trout Joint Venture data and maps (<http://sain.utk.edu/ebtjv/index.php>)

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (<http://sain.utk.edu/ebtjv/download/priorityscores.php>)

Trout Unlimited Brook Trout Conservation Strategy (<http://www.tu.org/conservation/eastern-conservation/brook-trout>)

New York State Brook Trout Conservation Strategies  
([http://www.easternbrooktrout.org/docs/EBTJV\\_NewYork\\_CS.pdf](http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf))  
([http://www.easternbrooktrout.org/docs/brookie\\_NY.pdf](http://www.easternbrooktrout.org/docs/brookie_NY.pdf))

# Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area

## Cerulean Warbler Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

American redstart, red-headed woodpecker, American black duck, bald eagle, Baltimore oriole, black-billed cuckoo, Cooper's hawk, eastern wood-pewee, red-shouldered hawk, wood duck, wood thrush, Indiana bat

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The cerulean warbler lives high in mature and older deciduous forests with broken canopies in bottomland forests as well as forests on dry slopes and ridges. Common tree species used include oak, sycamore, cottonwood, maple, black locust, and elm. It prefers large tracts of at least 50 – 75 acres, but is more productive in tracts greater than 600 acres. This species is insectivorous and eats caterpillars, beetles, wasps, and bees.

The Partners in Flight (PIF) Lower Great Lakes Plain Conservation Plan (Physiographic Area 15) (Dettmers and Rosenberg 2003) identifies this species as one of 7 priority species in the area. Comparisons between the 1980–1985 and 2000–2005 breeding bird surveys for New York indicate that the Allegheny region is an important breeding area in New York for cerulean warblers, with the incidence of confirmed breeding stable to declining. According to the Cerulean Warbler Atlas Project (CEWAP), the Allegheny River-Salamanca region in Cattaraugus County is an important breeding area for the cerulean warbler, having the second highest number of birds counted within New York for this study. Range-wide, cerulean warblers have experienced a long-term population decline. Analysis of North American Breeding Bird Survey (BBS) data indicates that over the last 40 years, the decline has been steep and steady at a rate of about -3.0% per year. Remaining forest tracts in this area are extremely valuable to cerulean warblers, which also have expanded into the region in recent decades.

**Justification for species selection:** The cerulean warbler was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is a New York State Species of Greatest Conservation Need; a Special Concern Species in New York; classified as High-High on the Bird Conservation Region (BCR) 13 Priority List (USFWS 2007); and, a Species of National Conservation Concern, listed as “yellow” on the Audubon watch list. According to the PIF North American Landbird Conservation Plan, 97% of the breeding population is within the eastern avifaunal biome, and the cerulean warbler is among the most specialized and threatened birds of the deciduous forest and is in need of focused conservation attention throughout its range.

**State contribution to overall species population:** In New York State the cerulean warbler is mostly rare, but remains common in areas where suitable habitat still exists (NYSDEC 2010).

## **Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area**

Some principal breeding areas for the cerulean warbler remain in New York within the lowland plain south of Lake Ontario (NYSDEC 2010). Cerulean warblers are found in areas including the Montezuma Wetlands Complex, Allegheny State Park and National Forest, and the Hudson River Valley and Highlands of southeastern New York (Rosenberg et al. 2000).

### **Research needed:**

- Survey suitable habitat to determine most important breeding sites and potential breeding sites.
- Determine the use of forest patches by transient cerulean warblers in the spring and fall, include urban greenbelts.

### **Threats and threat assessment:**

#### **1. Forest fragmentation.**

##### **Research needed:**

- Further study is needed to determine the degree of fragmentation tolerated by cerulean warbler populations and to define the minimum forest tract size needed to support breeding populations of this species (NYSDEC 2010).

#### **2. Loss of habitat;** at breeding and wintering grounds, as well as migratory stopover habitat.

##### **Research needed:**

- Research is needed to identify specific target areas within the focal area for habitat conservation efforts in support of population goals.
- Research is needed on the life history of the cerulean warbler. The biology's of both male and female cerulean warblers: their conservation needs and any differences between them; factors affecting post-fledging survival; dispersal patterns and their extent as well as patterns of migratory connectivity.
- Research is needed on invasive species such as wood burrowing insects that have the potential of altering a forest ecosystem.
- Research is needed on the shift in forest dynamics within prime breeding habitats due to the increased levels of wind generated by wind turbines.

#### **3. Collision with structures.**

##### **Research needed:**

## **Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area**

- Research is needed to assess and reduce/mitigate risks from collisions (including off-shore oil platforms, wind farms, communication towers, etc.) Currently, little is known about the specifics on migratory behavior. More research is needed in this area to help reduce the risk of collisions with structures.

### **4. Environmental contaminants.**

#### **Research needed:**

- There are no known contaminant issues in this focal area at this time.

### **5. Climate change – changes in habitat community structure or prey base.**

#### **Research needed:**

- Investigate correlations between climate change and forest availability as a potential tool for predicting future changes in cerulean warbler distribution and management needs.
- Investigate correlations between climate change and timing of spring arrival.
- Investigate a change in frequency of catastrophic weather events, particularly hurricanes during the fall migratory period.

#### *Partners/potential funding:*

Haudenosaunee Confederacy, Refuges, U.S. Geological Survey (USGS), U.S. Forest Service (USFS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

#### *Population goal(s) for New York State:*

#### **Objectives:**

- Range-wide, protect or manage at least 1,500 continuous hectares of habitat to support 1,200-1,500 pairs of cerulean warblers in PIF Lower Great Lakes Plain (Physiographic Area 15).
- Achieve less imperiled status on BCR Priority Bird Species list or New York State Species of Greatest Conservation Need List.

## **Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area**

- Double cerulean warbler population in next 50 years (Cerulean Warbler Conservation Action Plan [USFWS 2007]).
- Increase continental population by 100% (PIF goal).

### **Research needed:**

- Current goals are broad, therefore, research is needed to refine population goals for cerulean warblers, and reduce critical knowledge gaps regarding demographics, population size and trends, and life history.

## **CONSERVATION DESIGN**

### *Strategies for addressing the threats*

#### **1. Forest fragmentation.**

- a. Develop and implement forest management plans for cerulean warbler. Support comprehensive forest planning on all public lands, incorporating needs and objectives to reverse declines of cerulean warbler.
- b. Reduce forest fragmentation and loss on breeding grounds by protecting large contiguous forest tracts via influencing regulatory agency decisions.
- c. Identify and manage for high quality post fledging habitat.
- d. Protect habitat –mature forest with multi-level, diverse canopies.
- e. Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess affects this will have on breeding habitat for the warbler (CPA).

#### **2. Loss of habitat** (breeding, wintering, migratory stopover).

- a. Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species (CPA).
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration/enhancement projects to benefit this species (ex. areas within and surrounding Iroquois National Wildlife Refuge [NWR], Oak Orchard Wildlife Management Area [WMA], Tonawanda Indian Reservation, and Galen WMA).
- c. Leverage money and partners to protect and improve winter habitat (Refuges, communities, Audubon, Natural Resource Damage Assessment and Restoration [NRDAR] funds).

## **Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area**

- d. Evaluate international options for NRDAR restoration projects when opportunity arises (Environmental Contaminants [EC]).

### **3. Collision with structures.**

- a. Evaluate impact of wind turbines at specific sites (Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario, etc.); assist with monitoring (CPA).
- b. Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act [SEQRA] process (CPA).

### **4. Environmental contaminants.**

- a. Include cerulean warblers in contaminants analysis for NRDAR and other projects (EC).

### **5. Climate change.**

- a. Strategy will depend upon results of research needs noted above.

#### *Partner organizations*

Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Forest fragmentation.**

- a. Develop Fact Sheets with best management practices (BMP) for Marcellus Shale drilling to reduce fragmentation (CPA 2012).
- b. Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation (CPA 2012).

### **2. Loss of habitat (breeding, migratory, winter stopover).**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat.
- b. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to cerulean warblers and/or their habitat.

## **Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area**

- c. Use the complete inventory of most important breeding sites and potential breeding sites to protect, restore, or enhance breeding and migration stopover habitat.
- d. Conservation delivery should focus on important areas for breeding cerulean warblers in New York as follows (from Rosenberg et al. 2000): Montezuma Wetlands Complex, Allegheny River-Salamanca region, Galen WMA, Iroquois NWR, Salmon Creek near Cayuga Lake, Allegany State Park and vicinity, Tonawanda Indian Reservation, Bear Mountain State Park, Castleton Island State Park, Letchworth State Park, West Point Military Reservation, Murray-Hulberton Area, and Chittenango Creek.
- e. Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.

### **3. Collision with structures.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. Projects identified to date include: Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario.
  - i. Evaluate impact of wind turbines in Allegany (Allegany Wind Farm in the Town of Allegany); assist with monitoring (CPA).
- b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. (CPA).
  - i. Develop the CPA website with links to all national guidance and guidelines (CPA 2012).
  - ii. Explore development of additional guidance based on species found in New York State; geographic patterns of migratory bat and bird use. (CPA)

### **4. Environmental contaminants.**

- a. Delivery will depend upon results of cerulean warbler contaminant analyses (which will provide an indication of potential effects).

### **5. Climate change.**

- A. Delivery will depend upon strategy determined from research noted above.

*Partners/potential funding:*

## **Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area**

- Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

### **OUTREACH**

- Develop the CPA website with links to all national guidance and guidelines.
- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.
- Develop Fact Sheets with BMP for Marcellus Shale drilling to reduce fragmentation.
- Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation.

### **MONITORING**

- As actions are undertaken, monitoring will need to be identified up front in order to implement it as part of the overall action.
- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future cerulean warbler population restoration activities.

### *References*

Cerulean Warbler Risk Assessment & Conservation Planning Workshop, Shepherdstown, WV, June, 2006.

Dettmers, R., and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.blm.gov/wildlife/plan/pl\\_15\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_15_10.pdf)).

Hamel, Paul B. 2000. Cerulean Warbler (*Dendroica cerulea*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/511>.



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NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

NYSDEC. 2010. Cerulean warbler fact sheet. (<http://www.dec.ny.gov/animals/59560.html>).

Rosenberg, Kenneth V., Sara E. Barker, and Ronald W. Rohrbaugh. 2000. An Atlas of Cerulean Warbler Populations. Final Report to USFWS: 1997–2000 Breeding Seasons. Cornell Lab of Ornithology, Ithaca, NY. December, 2000.

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

USFWS. 2007. A Conservation Action Plan for the Cerulean Warbler (*Dendroica cerulea*) produced for the USFWS, Division of Migratory Bird Management Focal Species Program. Revised version – 30 June 2007.

Existing strategies for cerulean warbler restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003). [http://www.partnersinflight.org/bcps/pl\\_15sum.htm](http://www.partnersinflight.org/bcps/pl_15sum.htm).
- Partners in Flight North American Landbird Conservation Plan [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/)
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)
- Conservation Action Plan for Cerulean Warbler (USFWS 2007) <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/CeruleanWarbler.pdf>

# Clubshell (*Pleurobema clava*): Allegheny Focal Area

## Clubshell Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

rayed bean, yellow lampmussel, northern riffleshell, and other mussels; spotted darter, bluebreast darter, longhead darter, and variegate darter

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Clubshell prefers clean, loose sand and gravel in medium to small rivers and streams. This mussel will bury itself in the bottom substrate to depths of up to 4 inches. Typically found in gravelly riffles, this species cannot tolerate mud or slackwater. In fact, it is very susceptible to siltation. Reproduction requires a stable, undisturbed habitat and a sufficient population of fish hosts to complete the mussel's larval development. When the male discharges sperm into the current, females downstream siphon in the sperm to fertilize their eggs, which they store in their gill pouches until the larvae hatch. The females then expel the larvae when a host fish is within close proximity.

Host fish may include common shiner, river chub, fantail darter, and central stoneroller). The related the Tennessee clubshell also uses these species as fish hosts (Weaver et al. 1991). In addition, the striped shiner, blackside darter, and logperch are also host fish. The larvae which manage to attach themselves by means of tiny clasping valves to the gills of a host fish grow into shelled juveniles. At that point they detach from the host fish and burrow into the stream sediment where they can grow and live for up to 50 years.

**Justification for species selection:** Clubshell is a Federally-listed (listing date Feb. 22, 1993) and a New York State-listed endangered species. The Recovery Plan states that it is possible that populations still live in the Cassadaga and Conewango Creek systems. The New York Field Office (NYFO) has ongoing partnerships with The Nature Conservancy (TNC) and New York State Department of Environmental Conservation (NYSDEC) to survey these areas with the goal of recovering this species. The Nature Conservancy has been surveying streams in western New York for clubshell mussels, as well as French Creek tributaries in Pennsylvania.

**State contribution to overall species population:** The clubshell mussel lived throughout the Ohio River basin and in a few streams in the Maumee River basin, a tributary to western Lake Erie. In New York, it has been seen at only one site on Cassadaga Creek, where six subfossil shells (shell fragment that has been eroded away) were collected in 1995 (Strayer 1995). Two sites with live clubshell mussels were found during 2005 State Wildlife Grant-funded (SWG) surveys in Cassadaga Creek. While New York is not specifically mentioned in recovery plan, Recovery lead, Bob Anderson (U.S. Fish and Wildlife Service [USFWS]), confirmed that the

## **Clubshell (*Pleurobema clava*): Allegheny Focal Area**

Cassadaga Creek may be important to address the need for viable populations in “two additional drainages” as per the clubshell and Northern Riffleshell Recovery plan (1994) (USFWS 2009).

### **Threats and threat assessment:**

Threats<sup>1</sup> (See 5 listing factors in Recovery Plan)

#### **Factor A. Destruction, modification, or curtailment of its habitat or range.**

- A. The clubshell is threatened by runoff and channelization, sedimentation, domestic and commercial pollution, infrastructure (including pipelines, highways), in-stream sand and gravel mining, and impoundments.

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes.**

- A. Mussels were historically collected for use in buttons and for scientific study.

#### **Factor C. Disease or predation.**

- A. Some site-specific impacts from predation (i.e., muskrats).

#### **Factor D. Inadequacy of existing regulatory mechanisms.**

- A. The Endangered Species Act (ESA) does not provide land use regulatory tools that are needed for long term maintenance of habitat and long term protection of species habitat.
- B. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as in-stream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

#### **Factor E. Other natural or manmade factors affecting its continued existence.**

- A. Invasive species such as zebra mussel/quagga mussel infestation.
- B. Flooding - excess sediments to bury mussel populations.
- C. Droughts - decrease in water levels, leave mussels suspended.
- D. Water quality - impacts include pollutants, sewage, and development.
- E. Climate change - water level rise, higher water temps, increased velocity, increase transport of bedload material and sediment.

### ***Recovery Goals***

#### ***Range-wide Recovery Goals/Objectives:***

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<sup>1</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## Clubshell (*Pleurobema clava*): Allegheny Focal Area

Maintain and restore viable populations of the endangered clubshell to a portion of its historical range in order to remove the species from the Federal list of endangered and threatened species.

### Recovery Criteria (*see Recovery Plan*)

In order to reclassify the clubshell to threatened, the following criterion must be met:

Viable populations must be documented in 10 separate drainages for this species. A viable population consists of sufficient numbers of reproducing individuals to maintain a stable or increasing population. These populations should include as many subpopulations as possible to maintain whatever fraction of the original genetic variability that remains.

The following drainages are identified as necessary to achieve recovery: Tippecanoe River (IN), East Fork West Branch, St. Joseph River (MI/OH), Fish Creek (IN/OH), Green River (KY), Little Darby Creek (OH), Elk River (WV), **French Creek (PA)**, **Allegheny River (PA)**, and two additional drainages.

*This criterion has been partially met (see 5 year review)*

### Research/Actions needed:

#### A. Determine life history, ecology, and status for identified hosts (Recovery Action 3.22).

1. Identify and map both actual and potential threats at existing sites, and identify activities or practices that may affect the clubshell (USFWS, TNC, NYSDEC) (Cost: \$5,000) (ESA).
2. Assess the effects of stream regulation on the existing populations in the Allegheny, and develop recommendations for dam operators to protect and enhance downstream clubshell habitat (ESA/TNC Allegheny River) (2012) (Cost: TBD).
3. Determine contaminant sensitivity for each life stage, particularly silt concentrations. (ESA/TNC, State University of New York – Oneonta (SUNY-Oneonta) (2013) (Cost: \$3,000).
4. Implement a quantitative monitoring program at sites within the reproducing populations to assess the reproductive condition of these populations (TNC to develop research proposal for Cassadaga Creek (Cost: \$3,000).
5. Continue genetic analysis to define the ranges of clubshell (*Pleurobema clava*) and Tennessee clubshell (*Pleurobema oviforme*) in the Cumberland and Tennessee Rivers. (USGS/NYFO/Pennsylvania Field Office [PAFO]/West Virginia Field Office [WVFO]) (Cost: TBD).

## **Clubshell (*Pleurobema clava*): Allegheny Focal Area**

6. Captive holding of clubshell may provide additional options for the species' recovery and re-establishment into historic habitat. Captive husbandry methods should be developed, and an assessment of historic habitat completed to identify sites where clubshell augmentation and re-establishment can be achieved (USGS, TNC, USFWS) (Cost: TBD).
7. NYFO to assist PAFO with the next 5 year status assessment; include New York in Recovery Plan.
8. NYFO to work with PAFO to identify specific research needs. (i.e. define population viability, separation distance, population protection, and habitat protection, to better understand the needs of the species).
9. Work with PAFO to develop a recovery action plan for the population in New York (not mentioned in species' recovery plan) (2011-2013).

### **B. Conduct surveys, as warranted, for additional populations (Recovery Action 2.5).**

1. Conduct additional surveys in Allegheny, Cassadaga, Conewango, Olean Creek, and Ischua Creek (TNC, USFWS) (Cost: \$10,000).
2. Use of Geographic Information System (GIS) tools to predict suitable habitat in New York to assist in identifying where to conduct surveys and to use in reviewing Conservation Planning Assistance (CPA) activities (2012 TNC, USFWS) (Cost: \$2,000).
3. Create GIS map of above watersheds. Completed October 2010.

### **C. Identify activities or practices within each ecosystem that may affect the clubshell (Recovery Action 1.3).**

1. Develop conservation measures to minimize impacts of regulated activities (i.e., sediment and erosion control plans, cofferdams) and reduce sedimentation.
2. Identify and participate in ongoing environmental planning and regulatory compliance processes within each ecosystem.
3. Consider impacts to clubshell and other aquatic species when reviewing permits or recommending mitigation opportunities (CPA). Pipelines, bridge repair/replacement, stream mining or excavation, etc.

### **D. Identify activities or practices within each ecosystem that may affect the clubshell (Recovery Action 1.3).**

## **Clubshell (*Pleurobema clava*): Allegheny Focal Area**

1. Identify and participate in ongoing environmental planning and regulatory compliance processes within each ecosystem.
2. Develop or provide existing best management practices (BMP) and conservation measures to agencies/public that work in clubshell habitat (i.e., U.S. Army Corps of Engineers [USACE], NYSDEC, Allegany and Cattaraugus County Department of Public Works, New York State Department of Transportation [NYSDOT], county/town highway department). Conservation measures include minimizing sedimentation, turbidity, mining, nutrient and pollutant input, and identify areas where impoundments can be removed.
3. Consider impacts to clubshell and other aquatic species when reviewing permits or recommending mitigation opportunities for pipelines, bridge repair/replacement, stream mining or excavation, etc. (CPA).
4. Recommend USACE include conditions in regulatory permits that avoid take and protect suitable habitat for clubshell. Use mitigation tools for long term protection.

### **Other natural or manmade factors affecting its continued existence (Factor E)**

#### **Determine the response to zebra and/or quagga mussel invasions, and their control measures (Recovery Action 3.5).**

- A. Flooding - Stream restoration techniques to reduce sediment and reconnect streams to floodplains to reduce flood impacts (CPA, Partners for Fish and Wildlife [PFW]).
- B. Water quality impacts include pollutants, sewage, and development. Identify discharge in the vicinity of mussel populations, identify areas where contaminants may be, and minimize impacts to mussels due to development using sediment and erosion plans, reduce fill into waters of the U.S., and minimize bank stabilization.
- C. Climate Change - Evaluate impacts to mussels due to water level rise, higher water temps, increased velocity, increase transport of bedload material and sediment.
- D. Invasive Species –Identify areas with zebra mussel/quagga mussel infestation.
- E. Conduct genetic testing on clubshell populations in Ohio River drainage/New York population.

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

Please go to these documents for existing strategies:

## Clubshell (*Pleurobema clava*): Allegheny Focal Area

- Federal recovery plan (1994) <http://www.fws.gov/northeast/nyfo/es/clubshell.pdf>
- 5-year review completed (USFWS, ECOS 2009)  
<http://www.fws.gov/northeast/nyfo/es/clubshell.pdf>

Assist PAFO with Recovery Plan and 5 year assessment

- TNC Upper Allegheny River Basin Conservation Action Plan (2008)  
NYFO P:\Endangered Species\Mussels\Allegheny  
<http://www.alleghenybasin.org/>

Assist with update to TNC Conservation Action Plan

- Map known mussel populations. (Action 2.5) (ESA) (2011) (Completed).
- Identify areas that threaten water quality. Identify areas of high risk for hazardous spills and point and non-point runoff.
- Determine best approaches for the reintroduction and relocation of rare mussels.
- Work with interested landowners to preserve sensitive riparian forests through conservation easements and other land protection methods.

**Research /Recovery Actions needed:** (as per the 5 year assessment)

**Revise recovery plan and recovery criteria.**

Work with PAFO on Recovery Plan and 5 year review status in 2014.

### CONSERVATION DELIVERY

**Factor A. Destruction, modification, or curtailment of its habitat or range.**

- A. As needed, restore habitats and reintroduce the species to suitable areas (many subactions in Recovery Plan associated with this, see Action 4).
  1. Pilot project:
    - a. Augment 2 known Cassadaga Creek sites with PA clubshell
    - b. Conduct initial conference call with PAFO, TNC, and NYSDEC (completed)
    - c. Conduct follow up calls in February (completed)
    - d. Submit proposal for Regional Office and NYFO funding consideration (completed)

## **Clubshell (*Pleurobema clava*): Allegheny Focal Area**

- e. Determine NYSDEC/PAFO interest. NYSDEC not interested due to infectious pancreatic necrosis (IPN) concerns. PAFO interested (completed).

### **B. PAFO - Augmentation project.**

- 1. Allegheny River to Darby Creek in Ohio River basin (Fall 2010).

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes. No action**

### **Factor C. Disease or predation. No action**

### **Factor D. Inadequacy of existing regulatory mechanisms.**

- A. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as in stream mining, bridge piers, pipelines, etc.

- 1. Develop BMP for development (pipelines, bridges, and culverts) and provide recommendations to State and Federal agencies.

### **Factor E. Other natural or manmade factors affecting its continued existence.**

- A. Determine the response to zebra and/or quagga mussel invasions, and their control measures (Action 3.5).

- 1. Identify areas with zebra mussel/quagga mussel infestation (ESA/TNC).

- 2. Contact TNC, PAFO regarding known locations of invasive species (ESA).

- B. Flooding – stream restoration techniques to reduce sediment and reconnect streams to floodplains to reduce flood impacts (CPA, PFW).

- 1. Work with PFW to identify areas for restoration (2012-2013).

- C. Water quality impacts include pollutants, sewage, and development.

- 1. Identify discharges (point source) in the vicinity of mussel populations, identify areas where contaminants may be, and minimize impacts to mussels due to development using sediment and erosion plans, reduce fill into waters of the U.S., and minimize bank stabilization.

- D. Climate change. No action

### *Partners*

- USGS - Review and comment on proposed activities.



## **Clubshell (*Pleurobema clava*): Allegheny Focal Area**

TNC - Conduct research and monitoring.

NYSDEC - Conduct monitoring, SWG projects, coordinate project proposals.

Natural Heritage Program (NHP) - Update database annually with new survey information.

NYS DOT - recommend avoidance, minimization of impacts during project evaluation, conduct surveys when appropriate, and relocate mussels into New York (if required).

### **OUTREACH**

Participate in an outreach event to promote listed species conservation (2012-2013).

Enlist public support for the recovery process through an outreach program and incentives

Action 5. Ideas include:

1. Create Eastern hellbender/mussel display.
2. Increase public awareness of the recovery needs for these species.
3. Design an exhibit that educates the public on species threats and the need for ecosystem protection.
4. PFW could focus work in areas with known clubshell populations, and borrow exhibits for special events.
5. Create Fact Sheet for clubshell and upload to website.
6. Design posters, plates, and mugs.
7. Attend Freshwater Mollusk Conservation Society (FMCS) meetings.

### **MONITORING**

Continue to review and track recovery progress.

Secure funding for presence/absence studies.

Monitor the response to zebra and/or quagga mussel invasions, and their control measures.

#### *References*

TNC Upper Allegheny River Basin Conservation Action Plan (2008)

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## **Clubshell (*Pleurobema clava*): Allegheny Focal Area**

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# Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area

## Golden-winged Warbler Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

American woodcock, blue-winged warbler, brown thrasher, field sparrow, willow flycatcher, Canada warbler, yellow-breasted chat

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The golden-winged warbler (GWWA) is an imperiled neotropical migrant. In New York, the majority of its territories are in shrubby fields produced by secondary succession following farmland abandonment. It is insectivorous, eating moths and their pupae, winged insects, caterpillars, and spiders, while foraging generally in the upper half of small trees and shrubs. Nest sites are often located along the shaded edge of a forest-field (Confer 1992).

**Justification for species selection:** The GWWA is declining precipitously in the northeastern U.S. (7.6% per year in U.S. Fish and Wildlife Service [USFWS], Region 5), while increasing in the northern and northwestern portions of its range where farmland abandonment and clear cutting is common. The decline may be due, in part, to a loss of shrubland habitat. In addition, this decline correlates with the range expansion of the blue-winged warbler into the range of the GWWA. The northward expansion and resultant zone of overlap has led not only to increased competition, but also to widespread interbreeding between the golden-winged and blue-winged warblers. Because of this wide-spread hybridization, populations of pure GWWA may soon disappear after the arrival of the blue-winged warblers (Cornell Lab of Ornithology). Petition for listing received in 2010.

The GWWA was chosen as a priority species because of its importance in the northeast. It is a New York State (NYS) Species of Special Concern, a NYS Species of Greatest Conservation Need, and is rated High-High in Bird Conservation Region (BCR) 13. Golden-winged warblers require patches of herbs, shrubs, and scattered trees adjacent to forest edge secondary succession, and may use marshes and bogs with forest edge, moderate size sites 10-15 hectare (ha).

Global Population estimated at 210,000 individuals

BCR 13 population estimated at 10,000 individuals, only 5,000 in New York

Populations declining at approximately 7.5 % per year in Region 5

**State contribution to overall species population:** Range extends across New York; however, population declines in southeast New York have been observed. Slight population expansion

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

believed in Lake Ontario plain and northern New York. Breeding Bird Atlas results for 2000 to 2005 showed a significant population decline across the State with the only remaining stronghold in the St. Lawrence Valley of northwestern New York.

- Allegheny River Watershed – population estimate unknown, decreasing trend  
Research need: identify population goal.

### **Threats and threat assessment:**

- 1. Loss of sufficient quantity/quality of habitat**, largely as a result of habitat succession. Shrub and early successional habitats a high priority in the Lower Great Lakes Plain. (Dettmers and Rosenberg 2003).

#### **Research needed:**

- Research is needed to determine the range of suitable habitats and identify present breeding sites for GWWA in this region.
- Research is needed to compare early-succession habitats resulting from natural disturbances vs. forestry practices for high-priority species.
- Study of the impacts of human development on early succession species is needed.
- Research is needed to determine the effects of current game and waterfowl management practices on priority nongame species, especially the relationships between American woodcock management and GWWA population expansion.

- 2. Hybridization with blue-winged warbler.**

#### **Research needed:**

- Research is needed to determine habitat-management options (e.g. succession stage, water regime) that will discourage blue-winged warblers and favor GWWA.
- Research is needed to determine the influence of climate/temperature gradient and elevation upon GWWA and blue-winged warbler.

- 3. Interference or exploitation by blue-winged warbler.**

- 4. Nest parasitism by brown-headed cowbirds.**

- 5. Livestock overgrazing.**

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

- 6. Mowing and herbicide** treatment of woody areas (highway power line right-of-way [ROW]), especially during the breeding season.
- 7. Climate change:** Climate change may be pushing species northward and to higher elevations (GWWA Working Group identified this threat).

### **Research needed:**

- Research is needed to evaluate effects of climate change on both blue-winged warblers and GWWA.

- 8. Reduction in timber harvesting** in some areas.

- 9. Loss of winter habitat.**

Note: Several Important Bird Areas in New York that contain important shrub-early successional habitat of value to GWWA are: Hemlock and Canadice Lakes; Hi-Tor Wildlife Management Area; and, Letchworth State Park (Robertson & Rosenberg 2003).

### *Partners/potential funding:*

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, New York State Department of Transportation (NYSDOT), utilities, Partners in Flight (PIF).

### *Population goal(s) for New York State:*

8,500 pairs of GWWA. (Robertson & Rosenberg 2003) Objective: Provide roughly 260,000 ha of disturbed or shrub habitat to support the habitat-species guild, of which 18,000 ha should be suitable to support 8,500 pairs of GWWA (Robertson & Rosenberg 2003).

Objective: Roughly 40,000 ha of shrub habitat is required to maintain the entire habitat-species suite (e.g., 60,600 pairs of field sparrow); of this, 12,000 ha should be maintained in a condition suitable to support 3,000 pairs of GWWA (Dettmers & Rosenberg 2003).

## **CONSERVATION DESIGN**

### *Strategies for addressing those threats*

- 1. Loss of sufficient quantity/quality of habitat.**

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

- a. Prioritize permit review in breeding areas of this species (shrub, field, and forest habitat) (Conservation Planning Assistance [CPA]); influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
  - b. Participate in the GWWA Atlas project - survey dates for New York are May 10 to June 15 (<http://www.birds.cornell.edu/gowap/protocol.html>) (CPA).
  - c. Review wind energy projects within the watershed to minimize impacts to this species (CPA).
  - d. Review Marcellus shale gas development projects to minimize impacts to this species (CPA).
  - e. Prioritize grassland and shrub restoration projects that would benefit this species (Partners for Fish and Wildlife [PFW]).
  - f. Initiate discussions regarding a thorough inventory of potential grassland habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome (PFW).
  - g. Work with Partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PFW).
  - h. Use telemetry to monitor distributions and identify essential habitats.
  - i. Increase knowledge/understanding of GWWA in New York.
  - j. Analyze existing areas of shrub habitat and recently altered forest landscapes to determine potential breeding areas for this species.
  - k. Obtain breeding bird survey and GWWA Atlas data for this species to focus efforts.
  - l. Create map or shapefile for possible GWWA sites for all New York Field Office (NYFO) programs.
  - m. Review prescribed burning practices and potential for 5 -7 year rotation to sustain GWWA population over time.
- 2. Hybridization with blue-winged warbler.**
- a. Strategy will depend upon results of research need noted above.

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

b. Review literature and gather information, produce a summary of this review to be shared with NYFO staff. (CPA)

### **3. Interference or exploitation** by blue-winged warbler.

a. Strategy will depend upon results of research need noted above.

### **4. Nest parasitism** by brown-headed cowbirds.

a. Review literature for documentation/incidence of brown-headed cowbird parasitism upon GWWA in Allegheny watershed, produce a summary of this review to be shared with NYFO staff. (CPA)

b. Review potential brown-headed cowbird management practices.

i. Monitor GWWA nests and remove or addle cowbird eggs (Siegle and Ahlers, 2004).

ii. Shoot cowbirds during the GWWA breeding season (Siegle and Ahlers, 2004).

iii. Trap cowbirds until desired results are achieved (Siegle and Ahlers, 2004).

iv. Do not feed birds seed that is attractive to cowbirds, such as millet or milo (Siegel and Ahlers, 2004).

v. Reduce saplings and canopy at nesting locations to reduce perch sites for cowbirds.

### **5. Livestock overgrazing.**

a. Prevent livestock from entering breeding territories (Siegel and Ahlers, 2004).

b. Concentrate feeding areas as much as possible (Siegel and Ahlers, 2004).

c. Implement grazing rotation plan that relocates livestock during GWWA breeding season (Siegel and Ahlers, 2004).

### **6. Mowing and herbicide treatment** of woody areas (breeding season).

a. Determine whether species sensitivity is a consideration of mowing schedules along highways, ROW, and park campgrounds.

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

- b. Evaluate consequences, if any, of recommending a policy of not mowing or treating areas likely to support GWWA during breeding season, including ROW, along roadways, and utility ROW.

### **7. Climate change.**

- a. Strategy will depend upon results of research need noted above.

### **8. Reduction in timber harvesting in some areas.**

- a. Strategy will depend upon results of research need noted above.

### **9. Loss of winter habitat.**

- a. Strategy will depend upon results of research need noted above.

#### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCDs, TNC, Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, NYSDOT, utilities, PIF.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 - 2012

### **1. Loss of sufficient quantity/quality of habitat.**

- a. Prioritize permit review in breeding areas of this species (shrub, field, and forest habitat) (CPA); influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
  - i. Contact GWWA Working Group to determine if map of GWWA sites of concern exists.
  - ii. Obtain or create a map of GWWA sites of concern.
  - iii. Obtain or create a map depicting scrub-shrub and other habitat likely to support GWWA breeding requirements including utility ROW.
  - iv. Obtain or create a map with suitable GWWA habitat at higher elevations.
- b. Participate in the GWWA Atlas project - survey dates for New York are May 10 to June 15 (<http://www.birds.cornell.edu/gowap/protocol.html>) (CPA).
- c. Review wind energy projects within the watershed to minimize impacts to this species (CPA).



## Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area

- d. Review Marcellus shale gas development projects to minimize impacts to this species (CPA).
  - i. Contact NYSDEC to determine areas where permits have been issued for Marcellus shale gas development. (CPA)
- e. Prioritize grassland and shrub restoration projects that would benefit this species and complete at least one restoration project for this species.
- f. Initiate discussions regarding a thorough inventory of potential grassland habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome (PFW) (FY 2011 – FY 2012).
- g. Work with Partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PFW) (FY 2012 – FY 2013).
- h. Use telemetry to monitor distributions and identify essential habitats.
- i. Determine if telemetry studies have occurred or are ongoing.
- j. Increase knowledge/understanding of GWWA in Allegheny watershed and New York.
  - i. Contact John Confer, Ithaca College and communicate results of conversation to NYFO staff. (Staff time). (CPA)
- k. Analyze existing areas of shrub habitat and recently altered forest landscapes to determine potential breeding areas for this species (see 1.A.i.).
- l. Obtain breeding bird survey and GWWA Atlas data for this species to focus efforts (FY 2011 – FY 2012).
- m. Create map or shapefile for possible GWWA sites for all NYFO programs (FY 2011 – FY 2012).
- n. Work with NRCS to provide technical assistance to restore acres and habitat utilizing the Wildlife Habitat Incentives Program (WHIP) (PFW) (FY2011 – FY2013).
  - i. Contact NRCS to determine ongoing consideration given to GWWA and share resources to date (Staff time). (PFW)

## Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area

- o. Evaluate potential Natural Resource Damage Assessment and Restoration (NRDAR) cases (such as Sinclair Refinery) that may provide opportunity for scrub-shrub and golden-winged warbler habitat restoration (FY2011- FY2013) (Environmental Contaminants [EC] branch staff time).
  - p. Become a member of the Northeast PIF Working Group and Golden-winged Warbler Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group and share with NYFO staff as a FWS information resource. (CPA)
  - q. Review prescribed burning practices and potential for 5 -7 year rotation to sustain GWWA population over time.
- 2. Hybridization** with blue-winged warbler.
- a. Review literature and gather information (Staff time); produce a summary of this review to be shared with NYFO staff. (CPA)
  - b. Delivery will depend upon strategy determined from research above.
- 3. Interference or exploitation** by blue-winged warbler.
- a. Delivery will depend upon strategy determined from research above.
- 4. Nest parasitism** by brown-headed cowbirds.
- a. Review documentation and incidence of brown-headed cowbird parasitism upon GWWA in Allegheny watershed and New York State (Staff time).
    - i. Review literature (e.g. Confer 2003) (Staff time). (CPA)
    - ii. Determine whether annual monitoring of GWWA nests is presently ongoing in Allegheny watershed and New York (Staff time). (CPA)
    - iii. Produce a summary of this review to be shared with NYFO staff. (CPA)
  - b. Implement cowbird management practices to reduce population and/or parasitism rate upon GWWA brood success (FY2012- FY2013).
  - c. Livestock overgrazing.
  - d. Determine the extent of livestock grazing on ROW and review the requirements established, if any, through a permitting process.

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

- e. Mowing and herbicide treatment of woody areas (highway power line ROW), especially during the breeding season.
  - f. Determine whether species sensitivity is a consideration of mowing schedules along highways, ROW, and park campgrounds.
    - i. Contact State park authorities, utility companies, and NYSDOT (FY2011 – 2013).
  - g. Climate change.
    - i. Delivery will depend upon strategy determined from research above.
- 5. Reduction in timber harvesting** in some areas.
- a. Delivery not yet determined.
- 6. Loss of winter habitat.**
- a. Delivery not yet determined.

### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCDs, TNC, Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, NYSDOT, utilities, PIF.

## **OUTREACH**

- 1. Landowner education.**
- a. Provide actual and potential PFW applicants with information regarding GWWA habitat requirements for consideration (FY2011 – FY2013).
  - b. Call for grant proposals to fund landowner education and outreach through private organizations (e.g. Audubon New York, Cornell Lab of Ornithology, Wilson Ornithological Association) (FY2012 – FY2013).
- 2. Public involvement.**
- a. Provide actual and potential PFW applicants with information regarding GWWA habitat characteristics (FY2011 – FY2012).
- 3. NYSDOT and utilities.**

## Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area

a. Invite NYSDOT and utilities to outreach events (FY2012 - FY2013).

#### 4. Agencies (NRCS, U.S. Army Corps of Engineers, etc.).

a. Partner with NRCS and provide PFW applicants with information on the WHIP relative to the GWWA (FY2011 – FY2013).

#### 5. Smart Growth and Land-use Planning.

a. Consider an endorsement to provide businesses and developers with an incentive to redevelop areas already developed and/or industrialized rather than develop undeveloped lands.

### MONITORING

- Develop protocols to measure success of all conservation delivery activities
- Work with Partners to identify leads for accomplishing monitoring activities
- Develop best management practices from results of monitoring to inform future GWWA population restoration activities.

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USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Iñigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panjabi, D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website. [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/). (VERSION: March 2005).

Robertson, Bruce and Kenneth V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003. ([http://www.partnersinflight.org/bcps/plan/pl\\_24\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf)). Existing strategies for GWWA restoration:

Please refer to the following documents for existing strategies:

- NYSDEC Recovery Plan – Sterling Forest Bird Conservation Area (Orange Co.), John Thatcher BCA (Albany Co.), Letchworth Park (Livingston Co.). <http://www.dec.ny.gov/animals/27024.html>.
- Golden-winged Warbler Status Assessment and Conservation Plan. <http://web.utk.edu/~buehler/GWWA/status.htm>.
- The Nature Conservancy Species Management Abstract. [http://www.nbii.gov/portal/community/Communities/Ecological\\_Topics/Bird\\_Conservation/USFWS\\_Focal\\_Species/Golden-winged\\_Warbler/Distribution\\_&\\_Abundance/](http://www.nbii.gov/portal/community/Communities/Ecological_Topics/Bird_Conservation/USFWS_Focal_Species/Golden-winged_Warbler/Distribution_&_Abundance/).
- Partners in Flight Bird Conservation Plan, Allegheny Plateau. [http://www.partnersinflight.org/bcps/plan/pl\\_24\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf).
- Golden-winged Warbler Atlas Project. <http://www.birds.cornell.edu/gowap/why.html>.
- Golden-winged Warbler Conservation Initiative.

## **Golden-winged Warbler (*Vermivora chrysoptera*): Allegheny Focal Area**

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003).  
[http://www.partnersinflight.org/bcps/plan/pl\\_18\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_18_10.pdf).
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005).  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region 13 (Atlantic Coast Joint Venture 2007).  
[http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004).  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm).
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005).  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- A Plan for Conserving Grassland Birds in New York,” Final Report to NYSDEC (Morgan & Burger 2008).  
<http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf>.

# Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

## Eastern Hellbender Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

brook trout, long-tailed salamander, rayed bean, clubshell, yellow lampmussel, Northern riffleshell, spotted darter, bluebreast darter, longhead darter, variegated darter

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The hellbender is an obligately aquatic salamander whose populations have substantially declined in 14 of 17 states within its geographic range over the past several decades. Hellbenders are listed as vulnerable, imperiled, or critically imperiled in these states. The two subspecies of hellbender, the Eastern (*Cryptobranchus a. alleganiensis*) and the Ozark Hellbender (*Cryptobranchus a. bishopi*) were listed as “near threatened” on the IUCN (The World Conservation Union) Red List of Threatened Species in 2004. The listing was primarily due to loss of habitat from agricultural practices, mining, clear cutting of riparian, recreation and transportation development, as well as dam construction. The U.S. Fish and Wildlife Service (USFWS) has placed the Ozark Hellbender on the Federal candidate list in 2001 under Section 4 of the Endangered Species Act. A Federal candidate assessment was completed in 2003 for the Eastern Hellbender (Mayasich *et al.* 2003) and a second assessment is currently underway by the USFWS Columbus Field Office to consider potentially listing the Eastern subspecies. Both subspecies are being proposed for inclusion in Appendix III of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) to protect them from international trade pressures. New York State has the Eastern subspecies which is only found in a few populations in the Allegheny and Susquehanna River watersheds. The hellbender has been State listed as special concern since 1983; current review of the State listings by the New York State Department of Environmental Conservation (NYSDEC) indicate that the listing level may be raised to threatened or endangered. Historically, hellbenders were found in substantial numbers, especially in the Allegheny River watershed. Similar to many amphibians, hellbenders are indicators of stream health and with populations at the most northern extent of their range, they face many threats and are vulnerable because they reside in sparse habitat and require flat rocks > 30 cm. They are a long-lived species and are late maturity breeders. Hellbenders are a high priority for the NYSDEC. The New York State recovery plan is in draft (Bell *et al.* 2010). In Pennsylvania, hellbenders are listed in the State Wildlife Action Plan. They are of immediate concern and in need of a status assessment to determine distribution and abundance. Pennsylvania is seeking higher protection, although currently hellbenders can be collected with a fishing license.

**Justification for species selection:** The Eastern Hellbender is a potential Federal candidate species. It is listed as special concern in New York and will likely be elevated under current

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

listing review. The NYSDEC has drafted a recovery plan to increase conservation efforts in the state. Because of its specialized habitat requirements and being an edge-of-range species (exists in patchy habitat), population levels in New York will naturally be low in comparison to core populations. Laboratory work has indicated high genetic diversity in the Allegheny River watershed versus other areas of their geographic range. Fourteen of 17 states indicate population declines. The hellbender is the largest amphibian in the state and it only occurs in two watersheds in the state. They are a long-lived (25+ years) species, and are late maturity breeders (5-7 yrs).

### Actions/Research needed:

- i. Assist NYSDEC with generating priority site map.  
  
(FY2011; Partners: New York Field Office [NYFO], NYSDEC, Buffalo State College (BSC), State University of New York (SUNY) Cortland; Cost: staff time) (ESA)
- ii. Provide technical assistance pertaining to State recovery plan.  
  
(FY2011; Cost: staff time) (ESA)
- iii. Coordinate with the Regional Office, Pennsylvania Field Office and other Ecological Services (ES) Field Offices for the states of Maryland, Virginia, and West Virginia regarding hellbender conservation efforts to tie-in with greater USFWS strategic habitat planning.  
  
(FY2011; Partners: NYFO; Cost: staff time) (ESA)
- iv. Identify appropriate size of self-sustaining population in each watershed (modeling).
- v. Identify new sites with required specialized habitat.
- vi. Implement larval searches using established protocols for bank searching.
- vii. Survey deeper water areas using SCUBA.
- viii. Assist NYSDEC with surveys of historic and new sites to estimate current population sizes.  
  
(FY2011 work; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: unknown at this time) (ESA)
- ix. Identify threats at sites.
- x. Determine carp impact.



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- xi. Identify impacts of predatory fish (i.e. northern pike).
- xii. Cause of abnormalities – possible contaminants research; many individuals observed with abnormalities. NYFO contaminants biologists very interested in doing work.
- xiii. Captive propagation – already in place for Allegheny, NYSDEC actively working on this.

**State contribution to overall species population:** Currently, many hellbenders are known to be found in Allegheny River watershed and several tributaries.

### **Threats and threat assessment:**

#### **1. Loss of Habitat.**

- a. Increased sedimentation (i.e. causes embeddedness of natural flat rock habitat)
  - i. Road construction.
  - ii. Development.
  - iii. Riparian clearing - riparian trees provide necessary shade to lower water temperature and provide bank stability to prevent erosion and increased sedimentation at a site.

#### **2. Lack of recruitment.**

- a. Recent surveys in the watershed have indicated a shift in age class structure to older individuals. Few larvae and juveniles are found at sites.

#### **3. Stream barriers.**

- a. Dams and/or possible culverts may impede movement.

#### **4. Illegal collection.**

- a. Collection is primarily for the pet trade. This is a problem in parts of the hellbender geographic range and is likely a problem in New York.

#### **5. Environmental Contaminants.**

- a. Heavy metals, pesticides, and herbicide use are potential threats, sewage treatment plants, and thermal pollution.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area**

### **6. Predation.**

- a. Predation by fishes (i.e. northern pike), habitat disturbance by carp, or predation by other animals such as otter, waterbirds, or snapping turtles may have some impact on populations.

### **7. Disease.**

- a. *Batrachochytrium dendrobatidis*, also known as chytrid fungus, has been discovered in the Allegheny watershed in New York. Some hellbender sites have tested positive for chytrid in this watershed, but not all. It is unknown what impacts chytrid has on hellbenders.
  - i. Need to further understand the impacts of chytrid fungus on hellbenders.

### **8. Climate change.**

- a. Climate change may lead to flashy streams, stream dry-up, increased UV-B radiation, potential for the increased risk of *Saprolegnia* fungus, less oxygen with increased water temps, and increased mortality due to chytrid fungus. Research is needed to determine any impact climate change may have.
  - i. Identify whether flashy streams change macroinvertebrate populations (review literature).

### ***Recovery Goal for NYFO:***

Prevent candidate listing by implementing work identified under Conservation Delivery. Focus for Allegheny River watershed – priority focus should be to maintain or enhance existing populations and preserve genetic diversity.

### **Example metric:**

For known occupied site in Susquehanna River tributary – 900 m site, estimate ~30 individuals (data based on Blais 1996). As of 2008, one individual has been found at this site.

### **Recovery Criteria (as stated in State Recovery Plan):**

To maintain self-sustaining populations within the Allegheny River watershed in New York.

To maintain or enhance sufficient quality habitat in the Allegheny River watershed in New York.

See Bell *et al.* 2010

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area**

Eastern Hellbender Status Assessment Report (Mayasich *et al.* 2003)

[http://www.fws.gov/midwest/eco\\_serv/soc/amphibians/eahe-sa.pdf](http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf).

For a partial list of publications and current research see:

<http://www.hellbenders.org/publications.html> (Humphries 2006).

<http://www.caudata.org/cig/> (CIG undated).

### *Partners/potential funding:*

NYSDEC, Seneca Nation of Indians, Trout Unlimited (TU), New York State Department of Transportation (NYSDOT), The Nature Conservancy (TNC), BSC, Lycoming College (PA), Buffalo Zoo, Bronx Zoo, Binghamton Zoo

### *Population goal(s) for New York State:*

Unknown at this time

## **CONSERVATION DESIGN**

### *Strategies for addressing those threats*

- Develop standardized data collection sheets for surveys.  
(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)
- Assist NYSDEC with developing a database repository.  
(FY2011; Partners: NYSDEC; Cost: staff time) (ESA)
- Develop decontamination protocol to counter disease (*B.d.*).  
(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)
- Develop a surveyor list (see bog turtle guidance as model).  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
- Develop schedule scheme to set priorities for surveys.  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
- Develop protocols for surveys (see bog turtle guidance as model).

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)

- Develop protocol for PIT tagging.

(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)

- Develop sampling protocol for DNA collection.

(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)

- Develop sampling protocol for chytrid fungus.

(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)

- Develop a training program for hellbender surveys (to produce recommended surveyors).

(FY2013; Partners: NYFO, NYSDEC; Cost: staff time)

- Develop conditions to accompany scientific collectors permits for hellbender work.

(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)

- Provide technical assistance with USFWS status assessment (work being done by Columbus Field Office – Jeromy Applegate).

(FY2011; Partners: NYFO; Cost: staff time) (ESA)

- Research what types of funding sources exist in order to conduct surveys, enhance hellbender habitat, captively raise hellbenders, etc.

(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)

**Please refer to the following document for existing strategies:**

Draft *Cryptobranchus alleganiensis* Recovery Plan\* (Bell *et al.* 2010)

**\*\*The following are some of the ideas outlined in the NYSDEC Recovery Plan. Many details still require further development.**

General: Hold Recovery Meeting with NYSDEC and partners (Completed; FY2010)

### 1. Loss of Habitat.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area**

### **a. Increased sedimentation.**

- i. Seek to minimize loss of habitat in the following areas that support hellbenders by influencing regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction.

- Develop a training program for State and Federal permit processors to increase awareness of hellbender conservation.

(FY2012; Partners: NYFO, NYSDEC, U.S. Army Corps of Engineers [USACE], others? Cost: staff time)

- Develop conservation measures to minimize impacts and post on website in the form of fact sheets.

(FY2012; Partners: NYFO, NYSDEC, others? Cost: staff time)

- Determine appropriate buffer size needed around sites.
- Fence off problematic areas due to cattle grazing along stream margins.
- Develop fact sheets, other information about appropriate stream buffers, conservation measures for landowners.

### **2. Lack of Recruitment.**

- a. NYSDEC is enhancing hellbender habitat by placing additional large rock slabs at sites. NYSDOT is a major partner as they purchased and stock piled large rock for habitat improvement. Details of future plans for additional sites are currently being outlined by NYSDEC. This project was initiated as part of the captive propagation plan to add habitat for captive reared individuals.

- i. Assist NYSDEC with identifying new locations to enhance habitat.
- ii. Purchase additional large rock slabs.

### **3. Stream barriers.**

Need to identify barriers to remove, if any:

- a. Identify dams and culverts that are problematic to migration that could be removed.
- b. Determine the feasibility of providing fish passage for hellbenders.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area**

- c. Need to have information on genetic diversity in the area to avoid homogenization of populations.

### **4. Illegal collection.**

- a. Inform law enforcement about the high risk of collection.
- b. Educate officers on general hellbender information.

### **5. Environmental contaminants.**

- a. Develop an emergency response plan for contaminant spills in hellbender streams.
- b. Develop “information” on potential impacts of Marcellus and Utica shale drilling on water quality in streams supporting hellbender populations.
- c. Conduct fish sampling to evaluate emergent contaminants.

### **6. Predation.**

- a. Determine carp impact.
- b. Identify impacts of predatory fish (i.e. northern pike).

### **7. Disease.**

- a. Develop protocol for chytrid fungus sampling.
- b. Test hellbender sites to determine presence of chytrid fungus.

### **8. Climate change.**

- a. Research is needed to determine any impact climate change may have.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012

# Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

## 1. Loss of Habitat.

- a. Influence regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction by:
  - i. Develop fact sheets and best management practices (BMP) to minimize impacts to hellbenders.
  - ii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on hellbenders.
  - iii. Post these fact sheets/BMP on our website.
- b. Enhance stream habitat by placing large flat rocks and stabilizing stream banks with riparian buffers.
  - i. Assist NYSDEC project in tributary to Allegheny River. Potential for additional rock placement.  
  
(FY2012; Partners: NYFO, NYSDEC, NYSDOT, others? Cost: ~\$80,000?)

## 2. Lack of Recruitment.

- a. Captive propagation is underway at the Buffalo Zoo (an action currently underway based on tasks of recovery plan) (Bell *et al.* 2010).
  - i. Provide any technical assistance needed to NYSDEC and Zoo on captive propagation program.  
  
(FY2011-2013, Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)
  - ii. Provide technical assistance when NYSDEC is prepared for first release of captive propagated individuals.  
  
(FY2011-2013, Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: unknown at this time) (ESA)
  - iii. Seek out additional funding if needed to continue captive program.

## 3. Stream Barriers.

- a. Nothing identified in next 2-3 years.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area**

### **4. Illegal collection.**

- b. Nothing identified in this coming year – but is extremely important to address soon.

### **5. Environmental contaminants.**

- a. Nothing identified in the next 2-3 years – but NYFO contaminants biologists are very interested in developing a project.

### **6. Predation.**

- a. Nothing identified in the next 2-3 years.

### **7. Disease.**

- a. Nothing identified in the next 2-3 years.

### **8. Climate change.**

- a. Nothing identified in the next 2-3 years.

## **OUTREACH**

- Develop a stream/water quality/habitat traveling exhibit.  
(FY2012 or 2013; Partners: NYFO; Cost: unknown at this time)
- [Work with BSC on 2011 Hellbender Symposium.](#)  
(FY2011; Partners: NYFO, BSC, Pittsburgh Zoo, Western Pennsylvania Conservancy; Cost: staff time) (ESA)
- Develop a poster to use at National Fishing Day celebration (Completed; FY2010).
- Develop a hellbender wind sock to accompany poster on hellbender ecology (Completed; FY2010).
- Develop a brochure that promotes recovery (target fishermen).  
(FY2012; Partners: NYFO, NYSDEC; Cost: staff time)
- [Develop a website for hellbender or link to existing websites for outreach and contractors.](#)



# Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

(FY2011; Partners: NYFO; Cost: staff time) (ESA, IT)

## MONITORING

- Assist with development of protocols to measure progress/success of habitat restoration projects.
- Assist with development of protocols to measure progress/success of captive rearing and release of hellbenders.
- Assist with monitoring to measure progress/success of restored habitat and captive reared individuals.

## References

Bell, T., R. MacBlane, and B. Wheeler. 2010. Draft *Cryptobranchus alleganiensis* Recovery Plan. New York State Department of Environmental Conservation. Division of Fish, Wildlife and Marine Resources. 52 pp.

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Humphries, J. 2006. The Hellbender Homepage <http://www.hellbenders.org/publications.html>.

Mayasich, D.A., D. Grandmaison, and C. Phillips. 2003. Eastern Hellbender Status Assessment Report. NRRI/TR-2003/09. U.S. Fish and Wildlife Service. 43 pp. [http://www.fws.gov/midwest/eco\\_serv/soc/amphibians/eahe-sa.pdf](http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf).

# **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

## **Rayed Bean Species Action Plan**

### **FOCAL AREA: ALLEGHENY**

### **BIOLOGICAL PLANNING**

#### *Other species benefitting:*

clubshell, northern riffleshell, yellow lampmussel, and other mussels

#### ***Introduction to species***

**Species information:** The rayed bean is proposed for listing on the endangered species list as of November 2, 2010. The rayed bean belongs to the Unionidae family, North America's most imperiled major faunal group. Its current range includes Indiana, Michigan, New York, Pennsylvania, Ohio, and Ontario, Canada. The historical range of the rayed bean included Illinois, Indiana, Kentucky, Michigan, New York, Pennsylvania, Ohio, Tennessee, Virginia, West Virginia, and Ontario, Canada.

French Creek is a major tributary of the middle Allegheny River that supports the rayed bean. The headwaters of French Creek originate in western New York and flows into northwestern Pennsylvania where it drains into Lake Erie. This mussel is often found in shallow riffles in creeks or small rivers, often among aquatic plants. One of the largest known rayed bean populations is found in much of the lower portions of French Creek located in four Pennsylvania counties. The species is not known in the New York portion of French Creek.

The Nature Conservancy (TNC) has identified suitable habitat in New York including Cassadaga Creek, Conewango Creek, and the Allegheny River, Olean/Ischua Creek drainage (from the last half mile of Ischua Creek to the beginning of Olean Creek after the confluence of Ischua and Oil Creek). The habitat extends down to where the flood control structures begin in the City of Olean. Surveys will help us identify known locations and habitat for protection, restoration, and possible augmentation. Surveys should also target Chautauqua Lake and possibly the western Susquehanna River.

**Justification for species selection:** The New York State Department of Environmental Conservation (NYSDEC) lists the rayed bean as a State-endangered mussel. The U.S. Fish and Wildlife Service (USFWS) New York Field Office (NYFO) is the Region 5 lead for this species. The rayed bean historically was found across a wide expanse that included parts of the Midwest, the eastern United States, and north to Ontario, Canada. Once found in at least 112 streams, canals, and lakes, the rayed bean now occurs in only 28 streams and 1 lake; a 75 percent reduction in the number of occupied streams and lakes. The species has been extirpated from Illinois, Kentucky, Tennessee, and Virginia, but is still found in Indiana, Michigan, New York, Ohio, Pennsylvania, West Virginia and Ontario, Canada. The Allegheny River in Pennsylvania and French Creek in Pennsylvania appear to have the largest, best viable populations remaining.

## **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

Several other smaller, but considered viable, populations occur in isolated and generally short stream reaches (e.g., Cassadaga, Olean Creeks in New York).

**State contribution to overall species population:** Rayed bean is listed as endangered in New York State and as a Wildlife Species of Regional Conservation Concern in the northeastern United States with typically 5 or fewer occurrences.

### **Threats and threat assessment:**

Threats<sup>2</sup> (See 5-year review for full assessment):

### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Like the clubshell, rayed bean is threatened by habitat loss, runoff, channelization, sedimentation, domestic and commercial pollution, contaminants (i.e., ammonia), infrastructure (including dams, pipelines, highways), instream sand and gravel mining, and impoundments.

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Mussels were historically collected for food, use in buttons (in low numbers), and for scientific study.

### **Factor C. Disease or predation**

- A. Some site-specific impacts from predation (i.e. fish, drum, and sunfish, muskrats), parasites include water mites, trematode, leeches, bacteria, and some protozoa.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Listing will provide protection under the Endangered Species Act (ESA); however, ESA does not provide land use regulatory tools needed for long-term maintenance of habitat and long-term protection of species habitat.
- B. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as instream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

### **Factor E. Other natural or manmade factors affecting its continued existence:**

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<sup>2</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

- A. Population fragmentation and genetic diversity between populations.
- B. Flooding – excess sediments to bury mussel populations.
- C. Water quality impacts include pollutants, sewage, and development.
- D. Climate Change – water level rise, higher water temperatures, increased velocity, increased transport of bedload material, and sediment.
- E. Invasive species such as zebra mussel/quagga mussel and Asian clam infestation.

### ***Recovery Goals:***

#### ***Range-wide Recovery Goals/Objectives:***

Maintain and restore viable populations of the rayed bean to a portion of its historical range in order to preclude listing.

#### ***Conservation goal(s) for New York State:***

Work with TNC to prioritize streams for restoration/protection. Clear goals are needed for the New York portion of the range.

### **Research/Actions needed:**

#### **Factor A. Destruction, modification, or curtailment of its habitat or range:**

- A. The following drainages are identified for presence/absence surveys: Cassadaga Creek, Conewango Creek, Olean/Ischua Creeks, and the Allegheny River to determine whether there are additional populations in New York.
- B. Genetic studies are needed to determine population fragmentation and isolation.
- C. Determine contaminant sensitivity for each life stage.
- D. Monitor population status, including demographics, at existing sites through a collecting protocol.
- E. Monitor habitat and populations. Establish programs in streams with extant populations to monitor their status, document changes in immanency, and magnitude of threats, etc.
- F. Additional studies on life history and impacts to rayed bean from activities on specific life stage.
- G. Disease or predation – the occurrence of disease in mussels is virtually unknown.

#### **Factor B. The inadequacy of existing regulatory mechanisms:**

- A. Review and comment on 2012 Nationwide permits (U.S. Army Corps of Engineers [USACE]) Federal and State Regulations (i.e., Clean Water Act, Article 15) that

## **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

authorize activities such as instream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

### **Factor C. Other natural or manmade factors affecting its continued existence:**

- A. Identify the potential effects of and responses to zebra and/or quagga mussel invasions, and their control measures.
- B. Zebra mussels have attached in large numbers to the shells of live native mussels and have been implicated in the loss of mussel beds. Asian clams may ingest large numbers of unionid sperm, glochidia, and newly-metamorphosed juveniles. They actively disturb sediments, so dense populations may reduce habitable space for juvenile native mussels.

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Proposed rule to list the rayed bean as endangered (see Federal Register notice November 2, 2010).

- [Review proposed rule to list rayed bean as endangered \(ESA\).](#)
- [Conduct outreach to New York interested parties for proposed rule to list rayed bean as endangered \(ESA\).](#)

Ohio species lead. Potential increase in workload if asked to comment on proposed rule and if listed, potential increase in workload associated with recovery planning, outreach, etc.

Please go to these documents for the existing strategies:

- Candidate Notice of Review (2010)
- Status Assessment Report for the rayed bean, *Villosa fabalis*, occurring in the Mississippi River and Great Lakes systems (USFWS Regions 3, 4, and 5, and Canada) (2002) <http://www.fws.gov/midwest/Endangerd/clams/pdf/rayed-bean-sa.pdf>
- TNC Upper Allegheny River Basin Conservation Action Plan 2008

Assist with update to the TNC Conservation Action Plan

- [Map known mussel populations \(ESA, TNC\) \(2011\).](#)
- Identify areas that threaten water quality. Identify areas of high risk for hazardous spills and point and non-point runoff.
- Work with interested landowners to preserve sensitive riparian forests through conservation easements and other land protection methods.

## **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

Research or actions needed (see status assessment): Specific actions for the next 3 years addressing conservation design include the following:

- Help develop/influence existing comprehensive watershed plans where threats to the rayed bean are highest. (ESA, TNC)
- Implement comprehensive watershed plans.
- Determine stable population levels.
- Design and recommend best management plans (BMPs) for pipelines, bridges, and culvert projects that threaten rayed bean populations.
- Reduce mining impacts through permit review (Conservation Planning Assistance [CPA]).
- Adjust numerical criteria for pollutants (when reviewing water quality standards).
- Create Geographic Information Systems (GIS) database of known and potential habitat (Information Technology [IT]/CPA)(completed 2011)
- Determine additional fish hosts (i.e., darters and other fishes).
- Propagation technology needs to be developed to facilitate population, augmentation, and reintroduction into historical habitat.
- Read literature on species life history and habitat needs.
- Research demographic structure, effective population size, etc. The effective population size needed for long-term population viability is crucial information for recovery.
- Species augmentation and reintroduction at protected sites.
- Identify areas with zebra mussel/quagga mussel infestation.
- Contact TNC and the Pennsylvania Field Office [PAFO] regarding known locations of invasive species (2011).

### **CONSERVATION DELIVERY**

#### **Factor A. Destruction, modification, or curtailment of its habitat or range:**

- A. As needed, restore habitats by removing barriers, establishing riparian buffers and reintroduce the species to suitable areas.
1. Contact TNC, NYSDEC regarding potential restoration projects (ESA).
  2. Conduct a survey in Upper Allegheny River system in New York (TNC), if funding becomes available (2012-2013).
- B. Prioritize streams and watersheds for restoration of habitat.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
No action

**Factor C. Disease or predation:** No action

**Factor D. The inadequacy of existing regulatory mechanisms:**

## **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

- A. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as instream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

- 1. Develop BMPs and recommend to USACE.

### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Determine the response to zebra and/or quagga mussel invasions, and their control measures.

No actions planned

- B. Flooding – stream restoration techniques to reduce sediment and reconnect streams to floodplains to reduce flood impacts (CPA, Partners for Fish and Wildlife [PFW]).

- 1. Work with PFW to identify areas for restoration (2012-2013)

- C. Water quality impacts include pollutants, sewage, and development.

- 1. Identify discharges (point source pollution) in the vicinity of known mussel populations, identify areas where contaminants may be, and minimize impacts to mussels by using sediment and erosion plans, reduce fill into waters of the U.S., and minimize bank stabilization.

- D. Climate Change

No action

### **OUTREACH**

- 1. Educate local communities through use of fact sheets.
  - 2. Identify stakeholders.
  - 3. Develop posters and videos highlighting aquatic faunal groups, a riparian restoration and conservation video for streamside landowners, endangered species pamphlets, and mussel trunks (outreach/education kits) for educators.
  - 4. Design, construct Eastern hellbender/mussel display.

### **MONITORING**

- 1. Monitor habitat and populations.
  - 2. Establish programs in streams with extant populations to monitor their status, document changes in immanency, and magnitude of threats, etc.
  - 3. Monitor zebra/quagga mussel population (local watershed groups, TNC?).

## **Rayed Bean (*Villosa fabalis*): Allegheny Focal Area**

4. Monitor New York State Department of Transportation (NYSDOT) projects as necessary (CPA).
5. Monitoring plans should be implemented for the presence and potential expansion of alien species, such as the zebra mussel.
6. Request U.S. Geological Survey (USGS) funding, enter into Fish and Wildlife Information Needs and Studies (FWINS) (2012).
7. Determine potential impacts from lampricide on freshwater mussels.

### *Partners*

USGS: Review and comment on proposed activities

TNC: Conduct research and monitoring

NYSDEC: Conduct monitoring, State Wildlife Grant (SWG) projects, coordinate project proposals

New York Natural Heritage Program (NYNHP): Update database annually with new survey info.

NYSDOT: recommend avoidance, minimization of impacts during project evaluation, conduct surveys when appropriate, and relocate mussels into New York (if required).

### *References*

NYSDEC website <http://www.dec.ny.gov/animals/9406.html>

Strayer, D. and K.J. Jirka. 1997. The Pearly Mussels of New York State. New York State Museum. New York State Education Dept., Albany, NY.

TNC. Upper Allegheny River Basin Conservation Action Plan. 2008.

<http://www.fws.gov/northeast/nyfo/es/clubshell.pdf>

<http://www.alleghenybasin.org/>

USFWS. Status Assessment Report for the rayed bean, *Villosa fabalis*, occurring in the Mississippi River and Great Lakes systems (U.S. Fish and Wildlife Service Regions 3, 4, and 5, and Canada) <http://www.fws.gov/midwest/Endangered/clams/pdf/rayed-bean-sa.pdf>

USFWS. Status Assessment for Three Imperiled Mussel Species: Spectaclecase (*Cumberlandia monodonta*), Sheepnose (*Plethobasus cyphus*), and Rayed Bean (*Villosa fabalis*)

[http://www.fws.gov/orve/online\\_symposium\\_three\\_mussels.html](http://www.fws.gov/orve/online_symposium_three_mussels.html)



# Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area

## Spotted Darter Species Action Plan

### FOCAL AREA: ALLEGHENY

#### *Other species benefitting:*

Brook trout, Hellbender (New York State [NYS] special concern), Longtail salamander (NYS special concern), mussels (clubshell and rayed bean mussels), darters (including bluebreast and gilt darters (reintroduction))

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The spotted darter (*Etheostoma maculatum*) is part of the largest and most diverse darter genera, *Etheostoma*, of the family Percidae. Spotted darters are most commonly found in the faster, deeper riffles of medium to large streams with gravel and cobble substrate. This species spawns from May to early June in riffles 6-24 inches deep. Eggs are deposited in a wedge-shaped mass under flat stones 3-9 inches in diameter. The nests, guarded by males, are at least 4 feet apart. Females begin spawning at age 2 and spawn 2-4 times in a single 5 week spawning season. The primary food items are aquatic insect larvae, including immature Diptera (chironomids) and Trichoptera (caddisflies). In addition, larval Plecoptera (stoneflies), Ephemeroptera (mayflies), and Coleoptera (beetles) occurred frequently enough in diet studies to be considered important. Spotted darters may also be an important host species for Federally-listed mussel species in the Allegheny River.

**Justification for species selection:** Historical distribution of the spotted darter includes Indiana, Ohio, West Virginia, Pennsylvania, New York, and southward into Kentucky. In New York, the spotted darter occurred in the Allegheny River and the French Creek system. Today, the spotted darter occurs in the French Creek system in New York, and in Pennsylvania the species occurs in the French Creek system and remains present in the Allegheny River main stem (considered to be uncommon to rare). Overall, the range of the spotted darter has been reduced to 6 discrete watersheds in six states. Spotted darters are State-listed as either threatened or endangered in four of the six states where they occur. In New York, the spotted darter is listed as a threatened species and will likely be reclassified as endangered. The species is not Federally-listed, although a Status Assessment was completed in 2004. The spotted darter was also selected for this system as a surrogate for the gilt darter (*Percina evides*), which is believed to be extirpated from the State (last specimen captured was in 1937 in the Allegheny River). Gilt darter recolonization of the Allegheny River in New York from populations in Pennsylvania is being limited by the Kinzua Dam and Allegheny Reservoir. The New York State Department of Environmental Conservation (NYSDEC) is working with Conservation Fisheries, Inc., (Tennessee) to propagate gilt darters for re-introduction into the New York section of the Allegheny River.

## **Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area**

**State contribution to overall species population:** In New York, the spotted darter only inhabits a 14-mile section of the New York portion of the French Creek system. From its origin in New York, French Creek flows approximately 117 miles to the confluence with the Allegheny River in Pennsylvania. In Pennsylvania, the spotted darter occurs in the Allegheny River and the French Creek system. The spotted darters that occur in French Creek (New York/Pennsylvania) and the Allegheny River (Pennsylvania) together comprise one of the six disjunct populations across their range.

### **Research needed:**

- Determination of current population levels and presence/absence.

(Who: NYSDEC, The Nature Conservancy [TNC], U.S. Fish and Wildlife Service – New York Field Office [USFWS-NYFO] to assist with spotted darter surveys to determine presence/absence, population densities, and habitat utilization; Cost: use existing staff)

- Develop target population goals for this species in New York waters.

(Who: NYSDEC, TNC, USFWS-NYFO; Cost: use existing staff)

### **Threats and threat assessment:**

1. **Loss of habitat and habitat function;** habitat degradation and alteration - nutrients, sediment, development/clearing of riparian zone.

### **Research needed:**

- Extensive and frequent stream surveys to determine population size, presence/absence, and habitat utilization.

(Who: NYSDEC, Trout Unlimited [TU], USFWS-NYFO; Cost: NYFO staff time)

- Determine available habitat in Allegheny River and associated tributaries.

(Who: NYSDEC, USFWS-NYFO; Cost: unknown at this time)

- Determine feasibility of reintroduction of spotted darter to known former range and to create new populations where existing habitat occurs.

(Who: NYSDEC; Cost: unknown at this time)

- Identify priority stream reaches for habitat restoration, including stream bank stabilization and stream buffers.

## Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area

(Who: NYSDEC, TNC, USFWS-NYFO, U.S. Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS]; Cost: unknown at this time)

- Need to locate heritage streams and heritage populations.

(Who: U.S. Geological Survey [USGS], Eastern Brook Trout Joint Venture [EBTJV], NYSDEC; Cost: unknown at this time)

### 2. Barriers to Migration (including dams and impassable culverts).

#### Research needed:

- Identify which known barriers are having an influence on spotted darter distribution.

(Who: NYSDEC, TNC, USFWS-NYFO; Cost: unknown at this time)

### 3. Climate change; increased water temperatures and changes in riverine discharge regimes.

#### Research needed:

- Identification of climate change related impacts to spotted darter.

(Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

#### *Partners/potential funding:*

NYSDEC, TNC, Allegheny County Soil and Water Conservation District, Chautauqua County Soil and Water Conservation District, Chautauqua Watershed Conservancy.

#### *Population goal(s) for New York State:*

At this time, current population levels and trends for spotted darters in New York are unknown. The most intensive study completed in New York (1991-1992), yielded an average estimated abundance of 0.1 individuals per square meter with a range of 0.03 to 0.33 individuals per square meter for 9 sites. An overall conclusion of this study suggested that the abundance and age structure data were indicative of a healthy, self-supporting population of spotted darters. However, two repeat survey efforts (1994-1996, 1999-2000) captured only two spotted darters in total, so the conclusion of the 1991-1992 may not be accurate. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Allegheny River watershed.

# Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

- A. Loss of habitat and habitat function;** habitat degradation and alteration - nutrients, sediment, development/clearing of riparian zone.
1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, placement of fill in streams and wetlands, and natural gas/oil extraction.
  2. Target USFWS habitat restoration and enhancement projects to benefit spotted darter, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]).
  3. Conduct stream surveys to determine population size, presence/absence, and habitat utilization.
  4. Preserve, restore, and/or enhance streams known to support spotted darter, including habitat preservation through coordination with land trusts.
- B. Barriers to Migration** (including dams and impassable culverts).
1. Working with partners, identify and remove barriers.
  2. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA), to develop criteria for design of culverts, the modification of which would improve spotted darter passage.
  3. Working with partners, determine the feasibility of reintroduction of spotted darter to known former range and to create new populations where existing habitat occurs.
- C. Climate change; increased water temperatures and changes in riverine discharge regimes.**
1. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for the spotted darter.

*Partner organizations:*

## Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area

NYSDEC, TNC, USFWS-NYFO and Lower Great Lakes Fish and Wildlife Conservation Office [LGLFWCO], USDA-NRCS, NYSDOT, FHWA, TU, Allegheny County Soil and Water Conservation District, Chautauqua County Soil and Water Conservation District, Chautauqua Watershed Conservancy.

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Loss of habitat and habitat function;** habitat degradation and alteration - nutrients, sediment, development/clearing of riparian zone.
  - a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, placement of fill in streams and wetlands, and natural gas/oil extraction.
    - i. Develop fact sheets and best management practices (BMP) to minimize impacts to spotted darters from a suite of different construction activities (Conservation Planning Assistance [CPA])
    - ii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on spotted darter, including natural gas/oil extraction (CPA)
      1. Develop stream buffer guidelines/BMPs and post on website (CPA)
  - b. Target USFWS habitat restoration and enhancement projects to benefit spotted darter, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).
    - i. Add enhancements to natural stream channel design projects, including planting trees and shrubs to provide shade for water temperature control (PFW)
    - ii. Complete PFW projects that involve stream bank stabilization projects to reduce sediment input entering streams and reducing the quality of habitat (PFW)
    - iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on spotted darter, including natural gas/oil extraction (CPA)

## **Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area**

- iv. Work with USDA-NRCS and County Soil and Water Conservation Districts to utilize their program efforts to reduce agricultural impacts to streams, fencing, and stream buffers (CPA, PFW)
  - v. Develop stream buffer guidelines/BMPs and post on website (CPA)
  - c. Conduct stream surveys to determine population size, presence/absence, and habitat utilization.
    - i. Assist the NYSDEC in conducting stream surveys to determine population size, presence/absence, and habitat utilization (Endangered Species [ES])
  - d. Preserve, restore, and/or enhance streams known to support spotted darter, including habitat preservation through coordination with land trusts
    - i. Work with Land Trusts and TNC to identify parcels for protection (ESA)
- 2. Barriers to Migration** (including dams and impassable culverts).
- a. Working with partners, identify and remove barriers.
    - i. No work identified at this time.
  - b. Work with NYSDOT and FHWA, to develop criteria for design of culverts, the modification of which would improve spotted darter passage.
    - i. [Work on culvert design criteria as a member of the New York Culvert Working Group \(CPA\)](#)
  - c. Working with partners, determine the feasibility of reintroduction of spotted darter to known former range and to create new populations where existing habitat occurs.
    - i. NYSDEC has contracted with Conservation Fisheries, Inc. (Tennessee) to begin to understand the small-scale aquaculture requirements of the gilt darter with goals of production and reintroduction into former known ranges. No work identified for USFWS-NYFO at this time.
- 3. Climate change; increased water temperatures.**
- a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for the spotted darter.
    - i. Work with the National Weather Service to create models for determining temperature impacts to spotted darter within the watershed.

# Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area

## OUTREACH

The USFWS-NYFO can create a spotted darter page of “ongoing activities” on our website.

Partner with TNC on their ongoing Allegheny River and French Creek public awareness and outreach program.

Complete stream outreach materials that include the importance of non-game species, such as the spotted darter.

## MONITORING

- Work with NYSDEC to monitor spotted darter populations and trends.
- Work with the NYSDEC and TNC to monitor spotted darter habitat and utilization after restoration projects are complete. This includes electroshocking restored site to determine if spotted darters are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.
- Evaluate potential reintroduction efforts as strategy to increase spotted darter population levels.
- Seek funding and support for monitoring.

### *Partners*

NYSDEC, TNC, USFWS-NYFO/LGLFWCO, USDA-NRCS, TU, Alleghany County Soil and Water Conservation District, Chautauqua County Soil and Water Conservation District, Chautauqua Watershed Conservancy, academia (Allegheny College, Cornell University, etc.).

### *References*

Please refer to the following documents for existing strategies:

- Spotted Darter Status Assessment (USFWS 2004)  
[http://www.fws.gov/Midwest/eco\\_serv/soc/fish/spda-sa.pdf](http://www.fws.gov/Midwest/eco_serv/soc/fish/spda-sa.pdf)
- Conservation Assessment for the Spotted Darter (USDA Forest Service 2005)  
<http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/Fish/Spotted%20Darter.pdf>

USDA Forest Service. 2005. Conservation Assessment for the Spotted Darter. Prepared by T. Simon, Division of Fisheries, Aquatic Research Center, Indiana Biological Survey, Bloomington, Indiana.

## **Spotted Darter (*Etheostoma maculatum*): Allegheny Focal Area**

USFWS. 2004. Spotted Darter Status Assessment. Prepared by J. Mayasich and D. Grandmaison, Natural Resources Research Institute, University of Minnesota, Duluth, MN.

NYSDEC. 2010. Spotted Darter Fact Sheet (online).  
<http://www.dec.ny.gov/animals/26008.html>



## **FINGER LAKES ONONDAGA FOCAL AREA**

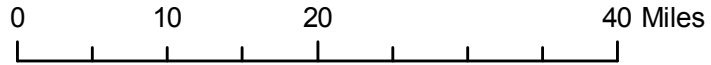
The Finger Lakes Onondaga Focal Area (FLOFA) is located in central and west-central New York and contains approximately 3,455 square miles or 6.3% of the state. The overall boundary is largely demarcated by the Seneca-Oswego River watershed, which drains into Lake Ontario. The FLOFA contains the transition from the Allegheny Plateau to the south with a local relief of 200-600 feet to the Ontario Lake Plain to the north with a local relief of 20-200 feet. Overall elevation range within the Finger Lakes region is 380-2200 feet. This FLOFA is characterized by the large lakes and glacial valleys that dominate this region of New York including the six main Finger Lakes – Canandaigua, Keuka, Seneca, Cayuga, Owasco, and Skaneateles Lakes, as well as Otisco, Onondaga, Cazenovia, and Oneida Lakes. These bodies of water represent some of the largest freshwater systems entirely within the state.

All of, or portions of, fifteen New York counties are included within the FLOFA boundary including Wayne, Ontario, Yates, Steuben, Schuyler, Chemung, Tompkins, Seneca, Cayuga, Cortland, Onondaga, Oswego, Madison, Oneida, and Lewis counties. Approximately 1,080,000 people live within this focal area, concentrated primarily in the Syracuse metropolitan area, with other concentrations in smaller cities such as Auburn and Ithaca. Land uses transition from agriculture and tourism to transportation and commercial/industrial uses in the more urban areas.

This focal area was selected because it contains significant aquatic resources supported by the extensive lake and river system. The focal area also contains the Montezuma National Wildlife Refuge and Northern Montezuma State Wildlife Management Area, part of the 50,000-acre Montezuma Wetlands Complex. There are currently one Federally-listed endangered (E) species, four threatened (T) species, one candidate (C) species, and four species of concern. Located within Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Region 15 (Lower Great Lakes Plain), the FLOFA supports significant habitat for migrating, over-wintering, and nesting waterfowl species, such as the American black duck. Extensive forested areas provide habitat for species such as the cerulean warbler and Indiana bat (E). The lakes and streams provide habitat for a diversity of fish species, including remnant populations of the once widespread brook trout and lake sturgeon populations. Extensive wetlands support important herpetofauna including the bog turtle (T) and massasauga rattlesnake (C). Additionally, limestone cliff habitats contain a diverse species assemblage including American hart's-tongue fern (T), Leedy's roseroot (T), and Chittenango ovate amber snail (T). The latter is restricted to one known location in the world.

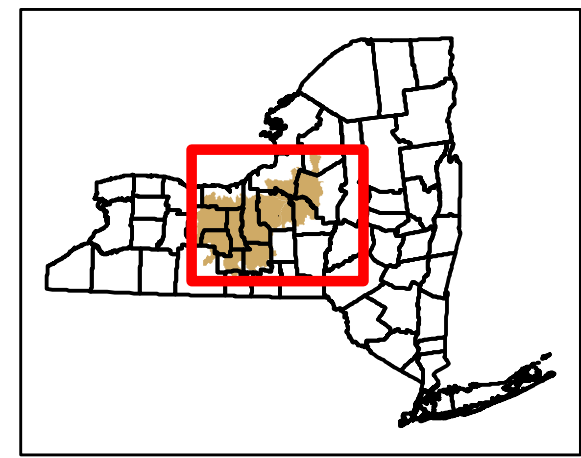
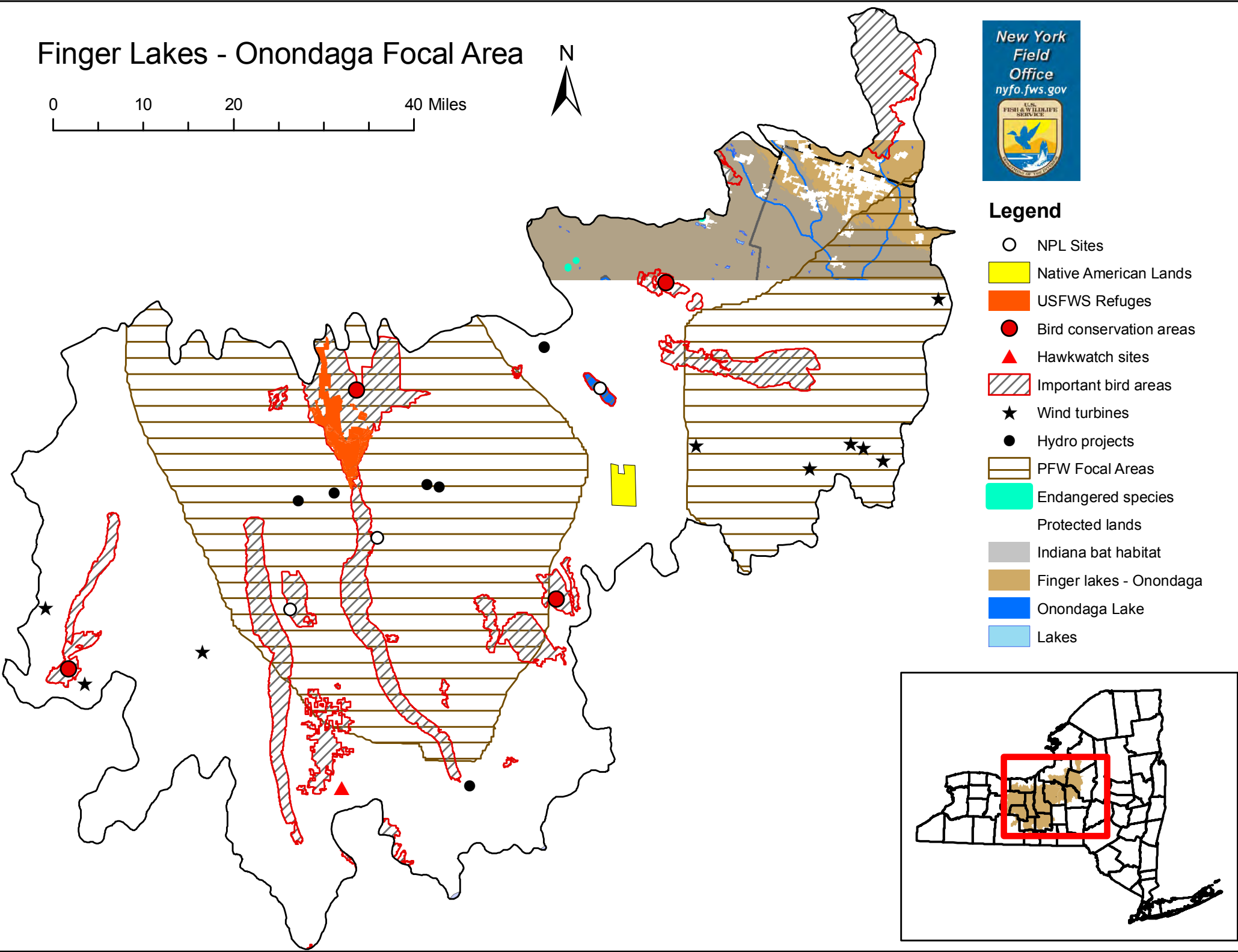
The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, navigation, water-level regulations, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss, fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, degraded water quality, and climate change. Current projects include the Onondaga Lake Natural Resource Damage Assessment and Restoration (NRDAR), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

# Finger Lakes - Onondaga Focal Area



## Legend

- NPL Sites
- Native American Lands
- USFWS Refuges
- Bird conservation areas
- ▲ Hawkwatch sites
- ▨ Important bird areas
- ★ Wind turbines
- Hydro projects
- ▨ PFW Focal Areas
- Endangered species
- Protected lands
- Indiana bat habitat
- Finger lakes - Onondaga
- Onondaga Lake
- Lakes



# **American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area**

## **American Hart's-tongue Fern Species Action Plan**

### **FOCAL AREA: FINGER LAKES/ONONDAGA**

#### *Other species benefitting:*

walking-fern spleenwort, maidenhair spleenwort, lady fern, bulbet fern, silvery spleenwort, glade fern, Goldie's woodfern, evergreen woodfern, marginal woodfern, eastern helleborine, Canada wild ginger, spotted jewelweed, pale jewelweed, Clayton's sweetroot, longstyle sweetroot, and broad-leaved goldenrod

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** American hart's tongue fern (AHTF) is a rare fern associated with dolomitic limestone, north to northeast-oriented steep, mesic slopes, and deciduous canopy cover (Faust 1960; Cinquemani Kuehn and Leopold 1993). Cinquemani Kuehn and Leopold (1993) found sporelings more associated with soil dominated by bryophytes which retain moisture. Mature plants require less bryophyte substrate cover, although rock crevices are necessary to reach maturation. Different light requirements are needed for the growth stages of AHTF. Sporelings are more associated with higher light intensity than mature plants. Greater exposure to light and evapotranspiration can deteriorate mature plants due to having a large leaf surface. Spring snow cover may prevent AHTF from growing on lower slopes, but winter snow pack is necessary to protect roots. Herbaceous overstory (26-50%) is needed for sporeling growth as the vegetation regulates humidity and temperature near the ground. As plants mature, they require less than 25% herbaceous cover. AHTF has evergreen strap-shaped fronds that are 5 to 17 inches long, 1.75 inches wide, and auriculate (lobed) at their base. Ferns recognized as belonging to the species *Asplenium scolopendrium* were first discovered in the U.S. in 1807, when Pursh found the species growing in central New York (Faust 1960). Surveys for this fern have been ongoing in New York since 1916 (Cinquemani Kuehn and Leopold 1992), and a large data-set exists.

**Justification for species selection:** American hart's tongue has been Federally-listed as threatened since 1989 and is State-listed as threatened. Although the U.S. Fish and Wildlife Service (USFWS) Region 4 has overall species lead, the New York Field Office (NYFO) is the Region 5 lead. In the southern part of its range, it is found only in entrances to pit caves. The entrances to these caves provide humidity and moisture levels that are associated with the populations found at more northern latitudes. It is threatened throughout most of its range by trampling, habitat alteration, or destruction by timber removal, quarry or residential development, and in New York, the invasive swallow-wort. Five sites have been extirpated in New York since 1924 due to quarry operations and other unknown reasons. Kelsall *et al.* (2004) report that overall, the New York population declined between 1995 and 2002. The New York Natural Heritage Program (NYNHP) (2007) states that there appears to be a slight decrease in

## **American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area**

the number of individuals in New York's population due primarily to competition from the invasive swallow-wort.

**State contribution to overall species population:** Approximately 92% of rangewide population exists within New York (Kelsall *et al.* 2004). Currently within Region 5, this species only occurs in New York. New York is only one of 4 states with AHTF; others include Alabama, Tennessee and Michigan, as well as along the Niagara Escarpment in Ontario, Canada. The fern is known from a limited area within Madison and Onondaga Counties representing 17 distinct populations.

### **Threats and threat assessment:**

Threats<sup>3</sup> (See 5-year review for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

##### A. Habitat alteration - four types:

1. Destruction by timber removal – removing trees opens up canopy, reduces needed shade and decreases humidity.
2. Quarrying – operations destroyed three of New York's populations in the past and still remains a threat to at least one site.
3. Residential development
4. Trampling and placement of debris/garbage on populations

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Inappropriate collecting remains a threat to populations.

#### **Factor C. Disease or predation: NA**

#### **Factor D. The inadequacy of existing regulatory mechanisms: NA**

#### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Encroachment of invasive plant species (i.e. swallow-wort, Asian honeysuckle, and European buckthorn). Swallow-wort is a significant threat in New York.
- B. Encroachment of invasive insect species – insect infestations that temporarily remove the leaves of the canopy or result in long-term damage to the trees found at a site remain a threat.
- C. Encroachment of evergreen tree species – AHTF is less associated with areas where evergreens (i.e. *Tsuga canadensis*) are present as these species lower soil pH, reduce

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<sup>3</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area**

winter snow pack, and reduce light penetration needed for sporelings (Cinquemani *et al.* 1988; Cinquemani Kuehn and Leopold 1993).

- D. Drought – may affect younger plants (sporelings) more adversely than more mature plants (Cinquemani Kuehn and Leopold 1992). Droughts occurring before spring leaf-out may prematurely expose plants to increased light intensity, soil temperature, and loss of soil moisture.
- E. Climate change – a potential threat to the health of AHTF colonies, but no one has yet quantified the possible impacts. Lower precipitation levels decreasing moisture in AHTF habitat, or a decrease in snow-pack during the winter months could have deleterious consequences for AHTF. New unfurling fronds may be susceptible to rain/snow damage during early spring. Reduced snow-pack may harm overwintering plants.

### ***Recovery Goals***

***Range-wide Recovery Goals/Objectives:*** AHTF will be considered for delisting when there are at least 15 self-sustaining populations of the species in the U.S. (2 in Alabama, 2 in Tennessee, 4 in Michigan, and 7 in New York) which are protected to such a degree that the species no longer qualifies for protection under the ESA.

***Conservation goal(s) for New York State:*** To have seven self-sustaining populations in New York that occur on sufficiently large tracts to ensure their perpetuation with a minimal amount of active management.

**Research/Actions needed:** Research is necessary to determine any impact climate change may have.

- A. Search for additional populations and characterize all known populations (Recovery Action 1.2)
  - 1. Conduct additional survey work outside perimeter of Clark Reservation and Chittenango Falls
- B. Determine population size and stage-class distribution for all populations (Recovery Action 2.1)
  - 1. 2008 census was done at all past known sites by the State University of New York College of Environmental Science and Forestry (SUNY-ESF) and funded by the USFWS. Census should be done at least every 5 years (to inform future 5-year reviews).
  - 2. Continue to fund and coordinate rangewide surveys of all populations at least every two years (FY2013).

## **American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area**

- C. Conduct long-term demographic studies and determine genetic variability within and between populations (Recovery Action 2.3)
  1. Establish a system for marking/flagging mature ferns for long-term study that will not be disrupted by outside parties.
  2. Monitor mature ferns at Clark Reservation and Chittenango Falls.
  3. Genetic analysis of populations at Clark Reservation and Chittenango Falls and offsite populations in and out of New York.

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan completed 1993
- 5-year review completed 2007
  - Next 5-year review anticipated in 5 years

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Develop plan of action for NY populations
  1. Hold AHTF workshop in Syracuse to develop strategy for long-term recovery implementation in New York (Recovery Actions 1 and 2) (FY2012)  
  
(Partners: USFWS, New York State Department of Environmental Conservation [NYSDEC], NYNHP, New York State Flora Association [NYSFA], SUNY-ESF, State Parks, New York State Office of Parks, Recreation and Historic Preservation [NYSOPRHP])
- B. Revise recovery criteria to explicitly state what should transpire prior to considering AHTF for removal from the Federal list of threatened species.
  1. Assist Region 4 (R4) whenever this is initiated.

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 - 2012

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

## **American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area**

A. Develop and implement a program to control swallow-wort in the New York AHTF populations.

1. Coordinate with NYSOPRHP regarding their planned invasive species management (FY2010, FY2011)  
(Partners: USFWS, NYSOPRHP, NYSDEC, NYSFA, SUNY-ESF, State Parks;  
Costs: staff time) (ESA)

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

No work in New York planned in next 2-3 years.

### **Factor C. Other natural or manmade factors affecting its continued existence:**

No work in New York planned in next 2-3 years.

## **OUTREACH**

To be determined.

## **MONITORING**

Review and track recovery progress.

Provide annual Recovery Data Call (RDC) information to R4 as requested (FY2010, 2011). (ESA)

### *Partners*

NYSDEC, NYSOPRHP, NYNHP

### *References*

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Cinquemani Kuehn, D.M. and D.J. Leopold. 1993. Habitat characteristics associated with *Phyllitis scolopendrium* (L.) Newm. Var. *americana* Fern. (*Apleniaceae*) in central New York. *Bulletin of the Torrey Botanical Club*. 120(3): 310-318.

## **American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area**

Faust, M. 1960. Survival of Hart's Tongue Fern in Central New York. *American Fern Journal*. 50: 55-62.

Kelsall, N., C. Hazard, and D.J. Leopold. 2004. Influence of climate factors on demographic changes in the New York populations of the federally-listed *Phyllitis scolopendrium* (L.) Newm. Var. *americana*. *Journal of the Torrey Botanical Society*. 131(2): 161-168.

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# American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

## American Black Duck Species Action Plan

### FOCAL AREA: FINGER LAKES/ONONDAGA

#### *Other species benefitting:*

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, greater and lesser scaup, long-tailed duck)

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

**Justification for species selection:** The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003). The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

**State contribution to overall species population:** Range extends across New York in freshwater habitat.

#### **Research needed:**

- Develop GIS tools to determine how much habitat remains.

(Who: New York Field Office [NYFO], Ducks Unlimited (DU) to assist with wetland surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff).

## American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

- Need to complete population modeling and habitat suitability indices to ascertain how much habitat is needed and where.

(Who: U.S. Fish and Wildlife Service [USFWS] [Ralph Tiner] and Buffalo District, U.S. Army Corps of Engineers [USACE]; Cost: unknown at this time).

- Design a regional management program, including increased coordination among managers and biologists, to prevent duplication of research efforts and to share current information (Fish and Wildlife Information Needs System [FWINS]).
- Regional monitoring program to provide better abundance and population trend information needed for secretive wetland birds.

(Who: Audubon, Cornell Lab of Ornithology, NYFO (GIS); Cost: use existing staff).

- Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during breeding.

(Who: State University of New York – College of Environmental Science and Forestry [SUNY-ESF], Audubon, Cornell Lab of Ornithology).

### Threats and threat assessment:

- 1. Loss of habitat and habitat function.** Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

#### Research needed:

- Need to characterize habitat loss.
  - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.
  - Develop GIS tools to determine how much high value habitat remains and how much is needed and where.
  - Characterize loss in habitat function (i.e. determine the cause).
  - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.
- 2. Invasive species** Invasive species, such as *Lythrum salicaria* or *Phragmites australis*, have impacts on wetland habitat, potentially adversely affecting black ducks.

# American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

## Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
  - Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
  - Evaluate effects of invasive plants.
  - Develop GIS tools to determine how much habitat remains free of invasives.
  - Need to characterize habitat loss due to invasives (i.e. what is causing it).
3. **Hybridization with mallards.** Hybridization between mallards (*Anas platyrhynchos*) and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

## Research needed:

- Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).
4. **Climate change.** Most existing climate change models predict less runoff and, therefore, lower water levels in the region.

## Research needed:

- Assess changes in habitat community structure.
  - Determine climate change impacts on prey base during breeding season.
5. **Public use** (recreational disturbances).
6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Great Lakes Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks.

(Who: New York State Department of Environmental Conservation [NYSDEC], NYFO, U.S. Environmental Protection Agency [USEPA] through the Great Lakes Restoration Initiative [GLRI]; Cost: NYFO staff time).

7. **Changes in prey base** during breeding season.

*Population goal(s) for New York State:*

# American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

## Research needed:

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for Great Lakes in New York.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### 1. Loss of habitat.

- a. Locate high quality migratory stopover habitat in the watershed utilizing GIS tools (Partners for Fish and Wildlife [PFW] and IT).
- b. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.
- c. Target USFWS habitat restoration and enhancement projects to benefit black ducks.
- d. Work closely with Montezuma National Wildlife Refuge (NWR) staff on landscape scale wetland restoration planning, and project construction and management.
- e. Work closely with Montezuma Audubon Center staff to develop shared restoration projects with shared goals and objectives.
- f. Facilitate habitat preservation through coordination with land trusts.
- g. Preserve, restore, and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.
- h. Protecting all remaining habitat. Use GIS or develop new tools to help identify and target especially the wetlands that have the highest potential to produce black ducks.
- i. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish black duck habitat restoration and protection.

#### 2. Loss of habitat function (values diminished).

## **American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area**

- a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

Coordinate Onondaga Lake Superfund Site BTAG activities to maximize potential for a remedy which protects wildlife (with USEPA [Environmental Contaminants (EC)]).

- b. Participate in evaluation of invasive species invasion and control in Finger Lakes/Onondaga area.
- c. Providing substantive comments on proposed wind farms, including the Alabama Ledge, Bishop, Cortland, Leicester, Enfield, and Paragon, among other proposals, to both Federal, State, and local agencies with regulatory influence over windpower project siting and operation.

### **3. Environmental contaminants.**

- a. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
- b. Continue to manage the Onondaga Lake NRDAR case.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Loss of habitat.**

- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:
  - i. Developing Fact Sheets and best management practices (BMP) to minimize impacts to black ducks.
  - ii. Posting these Fact Sheets/BMP on our website.
  - iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
- b. Deliver habitat restoration and enhancement projects by:
  - i. Developing a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.
  - ii. Develop Onondaga NRDAR case; consider black duck habitat restoration when developing restoration.

# American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

- iii. Restore – 10 acres of emergent wetlands and associated uplands to benefit black ducks in the Great Lakes watershed (GLRI) which includes the Finger Lakes drainage basin (PFW).
  - iv. Identify additional restoration opportunities in Owasco Inlet and Owasco Lake (PFW).
  - v. Survey Owasco Flats to obtain baseline information.
  - c. Influence regulatory agency decisions regarding siting, construction, and operation of wind turbines proposed for the Great Lakes watershed by:
    - i. Developing Fact Sheets and BMP to minimize impacts to black ducks and other waterfowl.
    - ii. Posting these Fact Sheets/BMP on our website.
    - iii. Providing substantive comments on proposed wind farms.
- 2. Loss of habitat function** (values diminished).
- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:
    - i. Developing Fact Sheets and BMP to minimize impacts to black ducks. (Conservation Planning Assistance [CPA], PFW).
    - ii. Posting these Fact Sheets/BMP on our website (IT).
    - iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks (CPA).
- 3. Environmental contaminants.**
- a. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
    - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to black ducks (2010-2013) (CPA).

*Partners/potential funding:*

# **American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area**

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), NYSDEC, Onondaga Audubon Society, County Soil and Water Conservation Districts (SWCD), TNC, DU, Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), Finger Lakes Land Trust (FLLT), New York Power Authority (NYPA), Syracuse University, SUNY-ESF.

## **OUTREACH**

- A. Participate in the New York Wetlands Forum to coordinate wetland restoration/protection activities that would benefit black ducks.
  - Landowner education
  - Public involvement

Create Outdoor Classroom wetland projects in the Finger Lakes watershed.

Develop a traveling exhibit which conveys information about impacts of environmental contaminants on wildlife and how habitat can be restored.

Continue to work with Owasco Watershed Association on public outreach events and activities.

## **MONITORING**

Develop protocols to measure success of all conservation delivery activities.

Work with Partners to identify leads for accomplishing monitoring activities.

Develop BMP from results of monitoring to inform future black duck population restoration activities.

## *References*

Dettmers, R., and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.blm.gov/wildlife/plan/pl\\_15\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_15_10.pdf)).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

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North American Waterfowl Management Plan: Strategic Guidance (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf>.

# **American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area**

North American Waterfowl Management Plan: Implementation Framework (2004).  
<http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf>.

North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998).<http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf>.

North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005) [http://www.acjv.org/wip/acjv\\_wip\\_main.pdf](http://www.acjv.org/wip/acjv_wip_main.pdf).

North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009) [http://www.acjv.org/documents/ACJV\\_StrategicPlan\\_2009update\\_final.pdf](http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf).

U.S. Fish and Wildlife Service. 2009. Waterfowl population status, 2009. U.S. Department of the Interior, Washington, D.C. USA.  
[http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Waterfowl/StatusReport2009\\_Final.pdf](http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Waterfowl/StatusReport2009_Final.pdf).

Zimpfer, N.L., Rhodes, W.E., Silverman, E.D., Zimmerman, G.S., and M.D. Kone. 2009. Trends in Duck Breeding Populations, 1955-2009. USFWS, Laurel, MD  
<http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Trends/Trend%20Report%202009.pdf>.

Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St Lawrence Plain (Rosenberg 2000). ([http://www.blm.gov/wildlife/plan/pl\\_18\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_18_10.pdf))
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf))
- Bird Conservation Plan for the Lower Great Lakes/ St. Lawrence Plain Bird Conservation Region (USFWS 2007). ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf))
- North American Waterfowl Management Plan: Strategic Guidance (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf>
- North American Waterfowl Management Plan: Implementation Framework (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf>
- North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998). <http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf>



## **American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area**

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005).  
[http://www.acjv.org/wip/acjv\\_wip\\_main.pdf](http://www.acjv.org/wip/acjv_wip_main.pdf)
- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009).  
[http://www.acjv.org/documents/ACJV\\_StrategicPlan\\_2009update\\_final.pdf](http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf)

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Finger Lakes**

### **Onondaga Focal Area**

#### **Bog Turtle Species Action Plan**

##### **FOCAL AREA: FINGER LAKES/ONONDAGA**

*Other species benefitting:*

spotted turtle, bog buckmoth, fen plant communities including Eastern Larch, black huckleberry, *Vaccinium corymbosum*, *Acer rubrum*, *Carex lasiocarpa*, *Sphagnum spp.*

#### **BIOLOGICAL PLANNING**

##### ***Introduction to species***

**Species information:** Bog turtles often hibernate communally with other bog turtles and with spotted turtles. The bog turtle emerges from hibernation which is often spent in an abandoned muskrat lodge or other burrow, by mid-April, when both the air and water temperatures exceed 50°F. Sexual maturity may be reached between 8-11 years old. Mating occurs in the spring (primarily) or fall, and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest (tussocks). The eggs hatch around mid-September and the adults enter hibernation in late October. Bog turtles live for 30 years or more in wetland (fen) communities and may use adjacent upland areas. Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

**Justification for species selection:** The bog turtle was Federally-listed as threatened in 1997 and listed as endangered by the State of New York. The bog turtle is a U.S. Fish and Wildlife Service (USFWS) Spotlight Species and Region 5 of the USFWS has a new bog turtle initiative.

**State contribution to overall species population:** There are 2 Recovery Units (RU) in New York – the Prairie Peninsula/Lake Plain (PPLP) RU (New York has all known extant sites) and the Hudson Housatonic RU.

##### **Threats and threat assessment:**

Threats<sup>4</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

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<sup>4</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act.

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Finger Lakes**

### **Onondaga Focal Area**

- A. Residential and commercial development continues to be a leading cause of habitat loss and degradation. Most direct effects to bog turtles and their habitat are now avoided. Indirect effects to wetlands remain.

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collection is an ongoing threat.

#### **Factor C. Disease or predation:**

- A. New concerns about potential disease issues in New York and Massachusetts.
- B. Predation is a threat at certain sites.

#### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Continues to pose a threat.

#### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Beaver use of sites, weather events (flooding, drought).
- B. Invasive species.
- C. Climate Change may or may not be a threat to the species.

#### ***Recovery Goals***

***Range-wide Recovery Goals/Objectives:*** Protect and maintain the northern population of this species and its habitat, enabling the eventual delisting of the species.

***Conservation goal(s) for New York State:*** Long range protection is secured for at least 10 populations in PPLPRU. We have 5 extant populations in New York.

#### **Research/Actions needed:**

- A. Determine goal, with the Pennsylvania Field Office (PAFO), for NY/PA for PPLPRU (FY2011) (Endangered Species [ESA]).
- B. Conduct surveys to re-evaluate the presence of bog turtles at historical sites in PPLPRU (Recovery Action 3.3.1) and conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4).

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*) Prairie Peninsula/Lake Plain Recovery Unit: Finger Lakes Onondaga Focal Area**

1. State University of New York (SUNY)-Oswego 2010 Great Lakes Restoration Initiative (GLRI) Phase 1 survey project.
    - a. Provide technical assistance for GLRI funding request for SUNY-Oswego proposal to address Action 3.4 and possibly Action 3.3.1 in Wayne and Cayuga Counties (FY2010) [completed].
    - b. Develop grant agreement (FY2010) [completed].
    - c. Manage grant agreement (FY2011-12).
  2. Provide technical assistance to SUNY-Oswego to develop follow-up proposal for Phase 2 surveys for GLRI grant (FY2011, New York Field Office [NYFO]-ESA).
- C. Monitor status of and threats to extant populations (Recovery Actions 3.5 and 6.1).
1. Monitoring of potential new disease is needed – work being done in Hudson Valley.
  2. Conduct bog turtle surveys at all extant sites.
    - a. Coordinate with New York State Department of Environmental Conservation (NYSDEC) Region 8 regarding plans for surveys and threat monitoring at Junius Ponds (FY2012).

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan completed 2001 (Service 2001).
- 5-year review drafted 2008 (Service 2008).
- Spotlight Species Action Plan 2009 (Service 2009).

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Participate in Rangewide Bog Turtle Initiative (NYFO ESA, Partners for Fish and Wildlife [PFW])
  1. Participate in conference calls [ongoing] (ESA).
  2. Attend March 10, 2010, meeting [completed FY2010].

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Finger Lakes**

### **Onondaga Focal Area**

3. Assist Alison Whitlock in planning and convening next workshop (FY2011). (ESA)
- B. In each recovery unit, identify and prioritize sites for appropriate conservation efforts (Recovery Action 2.1) \*\*All sites are priorities in PPLPRU at this time given the number of sites\*\*.
1. Initiate PPLPRU recovery implementation team (FY2011) (ESA).
  2. Develop a PPLPRU recovery implementation plan by August 1, 2011 (ESA).
  3. Develop site-specific management plans for each extant site is needed.
- C. Conduct research/studies to understand and identify the degree to which land-use activities alter bog turtle habitat (Recovery Action 6.2).
1. Conduct research to help understand indirect effects such as hydrological changes from residential and commercial development.
    - a. Request U.S. Geological Survey (USGS) Science Support Partnership (SSP) funding through Fish and Wildlife Information Needs and Studies (FWINS) posting (FY2011).
- D. Provide assistance to Regional Coordinator for development of 5-year review (ESA).

#### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threat FY2010-2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Protect bog turtle sites through purchase and conservation easements (Recovery Action 2.3).
  1. Provide technical assistance to partners that may be able to protect sites (Recovery Land Acquisition grant, New York State Department of Environmental Conservation [NYSDEC] Environmental Protection Fund [EPF], The Nature Conservancy [TNC] or land trusts).
  2. Target Section 404 mitigation projects.
- B. Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Finger Lakes**

### **Onondaga Focal Area**

activities in wetlands (Recovery Action 1.2) and Avoid and minimize direct and indirect adverse effects to bog turtles and their habitat (Recovery Action 1.3).

1. Develop standardized avoidance, minimization and compensation measures (AMM).
  - a. Pipelines
    - i. Utilize materials on pipelines (AMM's, best management practices [BMP]) from NiSource Habitat Conservation Plan [HCP] to develop pipeline fact sheet (FY2011). (ESA)
    - ii. Post BMP on website (FY 2011). (IT)
  - b. Marcellus shale drilling.
    - i. Assess potential threat – coordinate with PAFO.
  - c. Residential/Commercial Development.
    - i. Develop standardized exposure/response table and narratives to explain threats.
2. Identify opportunities to add features promoting bog turtle conservation for Clean Water Act (CWA) Section 404 compensatory mitigation permit requirements for development projects in counties with bog turtle populations.
3. Once identified, provide substantive comments on measures to avoid and minimize direct and indirect effects, including those effects associated with development that originate in uplands.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** No work in LPPRU planned in next 2-3 years.

**Factor C. Disease or predation:** Funding health assessment with Wildlife Conservation Society (WCS) – no samples planned from PPLPRU at this time.

**Factor D. The inadequacy of existing regulatory mechanisms:** No work planned in next 2-3 years.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Manage, restore, and maintain bog turtle habitat, as appropriate (Recovery Action 6.4) and control succession and invasive exotic plants (Recovery Action 6.3.1).

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*) Prairie Peninsula/Lake Plain Recovery Unit: Finger Lakes Onondaga Focal Area**

1. Consult with SUNY-Oswego (Dr. Rosenbaum) and NYSDEC to identify priority sites for invasive plant control (FY2011). (ESA)
2. Junius Ponds.
  - a. Conduct site visit with NYSDEC.
  - b. Develop site management plan (FY2012).
  - c. Develop GLRI project proposal if NYSDEC is interested (PFW).

## **OUTREACH**

Current ideas include:

- Update website with BMP.
- Target nature centers located in the Recovery Unit and research the need for educational opportunities.
- Design outreach exhibit to inform the public on bog turtle life history, threats (including Climate Change), avoidance, minimization, and conservation measures.

## **MONITORING**

Review and track recovery progress.

### *Partners*

NYSDEC, New York Natural Heritage Program (NYNHP), Natural Resources Conservation Service (NRCS), Finger Lakes Land Trust (FLLT), The Nature Conservancy(TNC), New York State Department of Transportation (NYSDOT), U.S. Army Corps of Engineers (USACE)

### *References*

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2008. Draft Bog Turtle Northern Population 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, State College, Pennsylvania

U.S. Fish and Wildlife Service. 2009. Draft Spotlight Species Action Plan.

# Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

## Brook Trout Species Action Plan

### FOCAL AREA: FINGER LAKES/ONONDAGA

#### *Other species benefitting:*

American eel, American shad, longtail salamander, wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow *pH* range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in *pH* caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds as highest priority for protection of brook trout populations.

**Justification for species selection:** The brook trout is a highly prized native sport fish, but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations, and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.



# Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

**State contribution to overall species population:** Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Finger Lakes/Onondaga watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

## Research needed:

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC and Trout Unlimited [TU] to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

## Threats and threat assessment:

1. **Loss of habitat and habitat function;** habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

## Research needed:

- Extensive and frequent stream surveys to determine population size.

(Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

- Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

(Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

- Need to locate heritage streams and heritage populations.

(Who: U.S. Geological Survey [USGS], EBTJV, NYSDEC; Cost: unknown at this time)

# Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

## 2. Barriers to Migration (including dams and impassable culverts).

### Research needed:

- Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

(Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

- Identify which known barriers are having an influence on brook trout distribution.

(Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

## 3. Competition from non-native salmonids.

### Research needed:

- Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

(Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

## 4. Climate change; increased water temperatures.

### Research needed:

- Identification of climate change related impacts to brook trout.

(Who: National Weather Service, LCC, academics; Cost: unknown at this time)

### *Partners/potential funding*

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, Onondaga County Soil and Water Conservation District (SWCD), Cayuga County SWCD, Seneca County SWCD, Tompkins County SWCD, The Nature Conservancy (TNC).

### *Population goal(s) for New York State:*

The EBTJV has numerous conservation goals, including “Conserve, enhance or restore brook trout populations”, and “...to perpetuate and restore brook trout populations throughout their historic range”; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate

# Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

with EBTJV, USGS, and NYSDEC to establish target population numbers for the Finger Lakes/Onondaga watershed. Establishing population goals remains a research need.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.
- c. Facilitate habitat preservation through coordination with land trusts.
- d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.
- e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified.
- f. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
- g. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

#### **2. Barriers to migration (including dams and impassable culverts).**

- a. Working with partners, identify and remove barriers.
- b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

## Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

- c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

### 3. Competition from non-native salmonids.

- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

### 4. Climate change; increased water temperatures.

- a. Coordinate with partners to identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout (USGS, NYSDEC, Lower Great Lakes Fish and Wildlife Conservation Office [LGLFWCO]; 2011-2013) (CPA, PFW).
- b. Design habitat enhancement projects which provide increased flow, stream shading, pool cover, increased availability of riffle habitat (NYFO PFW staff, one project 2011).

#### *Partner organizations*

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### 1. Loss of habitat.

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
  - i. Design habitat enhancement projects which provide increased flow, stream shading, pool cover, increased availability of riffle habitat (PFW).
  - ii. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.
  - iii. Post these fact sheets/BMPs on our website.

## Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

- iv. Writing substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA], Environmental Contaminants-Biological Technical Assistance Group to U.S. Environmental Protection Agency [EPA]).
  - v. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.
  - vi. Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review. (CPA).
  - vii. Develop stream buffer guidelines/BMP and post on website.
  - viii. Apply for EBTJV money for the implementation of 0.5 miles of in-stream restoration (PFW, LGLFWCO).
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).
- i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (Owasco Inlet, Cayuga Inlet; ½ mile) (PFW) (Funding – base funds, partnership with NYSDOT-PFW).
  - ii. Restoration work via natural channel design on Fall Creek (500 feet) (PFW and Cornell).
  - iii. Restoration work via natural stream design on Ninemile Creek and tributaries. (PFW with funding from base funds and NYSDOT – 1,500', 2011-2013).
  - iv. Restoration work via natural stream design on Onondaga Creek (PFW with funding from base funds and NYSDOT).
  - v. Restoration work via natural stream design to compensate for lost values from the Onondaga National Priorities List (NPL) site via NRDAR restoration projects. Especially continuing to investigate Amboy Dam removal.
- c. Facilitate habitat preservation through coordination with land trusts or non-governmental organizations (NGO).

## Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

- i. Work with TU's local chapters, Finger Lakes Land Trust, and Central New York Land Trust to identify parcels for protection.
  - d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).
    - i. Work with Owasco Flats Nature Reserve on a project in Owasco Inlet watershed to restore wetlands to form a buffer between agricultural activities and the waterway (PFW).
  - e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.
    - i. Work with Owasco Flats Nature Reserve on a project in Owasco Inlet watershed to restore wetlands to form a buffer between agricultural activities and the waterway (PFW).
    - ii. [Statewide – Conduct a training session for County SWCD staff on natural stream design \(PFW – March 2011\).](#)
- 2. Barriers to migration** (including dams and impassable culverts).
- a. Working with partners, identify and remove barriers.
    - i. No work indentified at this time.
  - b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.
    - i. No work indentified at this time.
  - c. Work with NYSDOT Region 3 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.
    - i. Design and install culvert baffle systems with NYSDOT Region 3; bury perched culverts as opportunities present themselves within this NYSDOT region (PFW 2011 – 2113).
- 3. Competition from non-native salmonids.**
- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.

# Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

- i. No work indentified at this time.
- d. **Climate change; increased water temperatures.**
  - a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
    - i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.
  - b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).
    - i. Owasco Inlet, Cayuga Inlet ( 2011 – 2013).

## OUTREACH

In addition to the web site, there is an EBTJV Google Group (<http://groups.google.com/group/ebtjv>).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of “ongoing activities” on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

Finger Lakes Onondaga pilot classroom project – TU’s Trout in the Classroom (PFW 2011). Trout in the Classroom (TIC) is an environmental education program in which students in grades k-12:

- raise trout from eggs to fry.
- monitor tank water quality.
- engage in stream habitat study.
- learn to appreciate water resources.
- begin to foster a conservation ethic.
- grow to understand ecosystems.

Most programs end the year by releasing their trout in a State-approved stream near the school or within a nearby watershed.

During the year each teacher tailors the program to fit his or her curricular needs. Therefore, each

# Brook Trout (*Salvelinus fontinalis*): Finger Lakes Onondaga Focal Area

program is unique. The TIC program has interdisciplinary applications in science, social studies, mathematics, language arts, fine arts, and physical education.

In each state, TIC is funded by a number of generous supporters and made more rich through varied partnerships. The NYFO role is to provide a mentor to a classroom teacher for technical assistance.

## MONITORING

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.
- Establish benchmarks for success based on EBTJV.
- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.
- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.
- Seek funding and support for monitoring.

### *Partners*

TU, NYSDEC, LGLFWCO

### *References*

Eastern Brook Trout Joint Venture main website (<http://www.westernbrooktrout.org>)

Eastern Brook Trout Joint Venture data and maps (<http://sain.utk.edu/ebtjv/index.php>)

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (<http://sain.utk.edu/ebtjv/download/priorityscores.php>)

Trout Unlimited Brook Trout Conservation Strategy (<http://www.tu.org/conservation/eastern-conservation/brook-trout>)

New York State Brook Trout Conservation Strategies  
([http://www.easternbrooktrout.org/docs/EBTJV\\_NewYork\\_CS.pdf](http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf))  
([http://www.easternbrooktrout.org/docs/brookie\\_NY.pdf](http://www.easternbrooktrout.org/docs/brookie_NY.pdf))



# **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

## **Cerulean Warbler Species Action Plan**

### **FOCAL AREA: FINGER LAKES/ONONDAGA**

#### *Other species benefitting:*

American redstart, red-headed woodpecker, American black duck, bald eagle, Baltimore oriole, black-billed cuckoo, Cooper's hawk, eastern wood-pewee, red-shouldered hawk, wood duck, wood thrush, Indiana bat

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** The cerulean warbler lives high in mature and older deciduous forests with broken canopies in bottomland forests as well as forests on dry slopes and ridges. Common tree species used include oak, sycamore, cottonwood, maple, black locust, and elm. It prefers large tracts of at least 50 – 75 acres, but is more productive in tracts greater than 600 acres. This species is insectivorous and eats caterpillars, beetles, wasps, and bees.

The Partners in Flight (PIF) Lower Great Lakes Plain Conservation Plan (Physiographic Area 15) (Dettmers and Rosenberg 2003) identifies this species as one of 7 priority species in the area. Comparisons between the 1980–1985 and 2000–2005 breeding bird surveys for New York indicate that the Finger Lakes region is an important breeding area in New York for cerulean warblers, with the incidence of confirmed breeding stable to declining. Range-wide, cerulean warblers have experienced a long-term population decline. Analysis of North American Breeding Bird Survey (BBS) data indicates that over the last 40 years, the decline has been steep and steady at a rate of about -3.0% per year. Remaining forest tracts in this area are extremely valuable to cerulean warblers, which also have expanded into the region in recent decades.

**Justification for species selection:** The cerulean warbler was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is a New York State Species of Greatest Conservation Need; a Special Concern Species in New York; classified as High-High on the Bird Conservation Region (BCR) 13 Priority List (USFWS 2007); and, a Species of National Conservation Concern, listed as “yellow” on the Audubon watch list. According to the PIF North American Landbird Conservation Plan, 97% of the breeding population is within the eastern avifaunal biome, and the cerulean warbler is among the most specialized and threatened birds of the deciduous forest and is in need of focused conservation attention throughout its range.

**State contribution to overall species population:** In New York the cerulean warbler is mostly rare, but remains common in areas where suitable habitat still exists (NYSDEC 2010). Some principal breeding areas for the cerulean warbler in New York are within the Finger Lakes highlands (NYSDEC 2010). Cerulean warblers are found in areas including the Montezuma

# **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

Wetlands Complex, Allegany State Park and National Forest, and the Hudson River Valley and Highlands of southeastern New York (Rosenberg et al. 2000).

## **Research Needed:**

- Survey suitable habitat to determine most important breeding sites and potential breeding sites.
- Determine the use of forest patches by transient cerulean warblers in the spring and fall, include urban greenbelts.

## **Threats and threat assessment:**

### **1. Forest fragmentation.**

#### **Research needed:**

- Further study is needed to determine the degree of fragmentation tolerated by cerulean warbler populations and to define the minimum forest tract size needed to support breeding populations of this species (NYSDEC 2010).

### **2. Loss of habitat;** at breeding and wintering grounds, as well as migratory stopover habitat.

#### **Research needed:**

- Research is needed to identify specific target areas within the focal area for habitat conservation efforts in support of population goals.
- Research is needed on the life history of the cerulean warbler. The biology's of both male and female cerulean warblers, their conservation needs and any differences between them; factors affecting post-fledging survival; dispersal patterns and their extent as well as patterns of migratory connectivity.
- Research is needed on invasive species such as wood burrowing insects that have the potential of altering a forest ecosystem.
- Research is needed on the shift in forest dynamics within prime breeding habitats due to the increased levels of wind generated by wind turbines.

### **3. Collision with structures.**

#### **Research needed:**

- Research is needed to assess and reduce/mitigate risks from collisions (including off-shore oil platforms, wind farms, communication towers, etc.) Currently, little is

# **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

known about the specifics on migratory behavior. More research is needed in this area to help reduce the risk of collisions with structures.

## **4. Environmental contaminants.**

### **Research needed:**

- Evaluate effect of Hg exposure on this species at Onondaga Lake (EC).

## **5. Climate change – changes in habitat community structure or prey base.**

### **Research needed:**

- Investigate correlations between climate change and forest availability as a potential tool for predicting future changes in cerulean warbler distribution and management needs.
- Investigate correlations between climate change and timing of spring arrival as related to change in prey base.
- Investigate a change in frequency of catastrophic weather events, particularly hurricanes during the fall migratory period.

### *Partners/potential funding*

Haudenosaunee Confederacy, Refuges, U.S. Geological Survey (USGS), U.S. Forest Service (USFS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

### ***Population goal(s) for New York State:***

### **Objectives:**

- Range-wide, protect or manage at least 1,500 hectares of habitat to support 1,200-1,500 pairs of cerulean warblers in PIF Lower Great Lakes Plain (Physiographic Area 15).
- Achieve less imperiled status on BCR Priority Bird Species list or New York State Species of Greatest Conservation Need List.
- Double cerulean warbler population in next 50 years (Cerulean Warbler Conservation Action Plan [USFWS 2007]).
- Increase continental population by 100% (PIF goal).

# Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area

## Research needed:

- Current goals are broad, therefore, research is needed to refine population goals for cerulean warblers, and reduce critical knowledge gaps regarding demographics, population size and trends, and life history.

## CONSERVATION DESIGN

### *Strategies for addressing the threats*

#### **1. Forest fragmentation.**

- a. Develop and implement forest management plans for cerulean warbler. Support comprehensive forest planning on all public lands, incorporating needs and objectives to reverse declines of cerulean warbler.
- b. Reduce forest fragmentation on breeding grounds by protecting large contiguous forest tracts via influencing regulatory agency decisions.
- c. Identify and manage for high quality post fledging habitat.
- d. Protect habitat – mature forest with multi-level, diverse canopies.
- e. Participate in Owasco Flats watershed planning.
- f. Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess effects this may have on breeding habitat for the warbler.

#### **2. Loss of habitat** (breeding, wintering, migratory stopover).

- a. [Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species \(CPA\).](#)
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration/enhancement projects to benefit this species in core breeding areas (ex. areas within and surrounding Montezuma National Wildlife Refuge [NWR]).
- c. Leverage money and partners to protect and improve winter habitat (Refuges, communities, Audubon, Natural Resources Damage Assessment and Restoration [NRDAR] funds).
- d. [Evaluate international options for NRDAR restoration projects when opportunity arises \(Environmental Contaminants \[EC\]\).](#)

# **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

## **3. Collision with structures.**

- a. Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act (SEQRA) process (CPA).
- b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. (CPA).

## **4. Environmental contaminants.**

- a. Include cerulean warblers in contaminants analysis for NRDAR and other projects (EC).

## **5. Climate change.**

- a. Strategy will depend upon results of research needs noted above.

### *Partner organizations:*

Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 - 2012

### **1. Forest fragmentation.**

- a. Develop Fact Sheets with best management practices (BMP) for Marcellus Shale drilling to reduce fragmentation (CPA).
- b. Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation (CPA).

### **2. Loss of habitat (breeding, migratory, winter stopover).**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat.
- b. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to cerulean warblers and/or their habitat.

## **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

- c. Use the complete inventory of most important breeding sites and potential breeding sites to protect, restore, or enhance breeding and migration stopover habitat.
- d. Conservation delivery should focus on important areas for breeding cerulean warblers in New York as follows (from Rosenberg et al. 2000): Montezuma Wetlands Complex, Allegheny River-Salamanca region, Galen Wildlife Management Area, Iroquois NWR, Salmon Creek near Cayuga Lake, Allegany State Park and vicinity, Tonawanda Indian Reservation, Bear Mountain State Park, Castleton Island State Park, Letchworth State Park, West Point Military Reservation, Murray-Hulberton Area, and Chittenango Creek in Onondaga and Madison Counties.
- e. Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.
- f. [Landscape planning for Owasco Flats \(CPA\)](#).

### **3. Collision with structures.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. Projects identified to date include: Alabama Ledge, Bishop, Cortland, Leicester, Enfield, Paragon, etc.).
  - i. [Evaluate impact of wind turbines at specific sites \(Alabama Ledge, Bishop, Cortland, Leicester, Enfield, Paragon, etc.\); provide technical assistance and review monitoring reports \(CPA\)](#).
- b. [Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. \(CPA\)](#)
  - i. Develop the CPA website with links to all national guidance and guidelines (CPA 2012).
  - ii. [Explore development of additional guidance based on species found in New York State, geographic patterns of migratory bat and bird use. \(CPA\)](#)

### **4. Environmental contaminants.**

- a. Delivery will depend upon results of cerulean warbler contaminant analyses (which will provide an indication of potential effects).

### **5. Climate change.**

# **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

- a. Delivery will depend upon strategy determined from research noted above.

## *Partners/potential funding:*

- Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

## **OUTREACH**

- Develop the CPA website with links to all national guidance and guidelines.
- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.
- Develop Fact Sheets with BMP for Marcellus Shale drilling to reduce fragmentation.
- Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation.

## **MONITORING**

- As actions are undertaken, monitoring will need to be identified up front in order to implement it as part of the overall action.
- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future cerulean warbler population restoration activities.

## *References*

Cerulean Warbler Risk Assessment & Conservation Planning Workshop, Shepherdstown, WV, June, 2006.

Dettmers, R., and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.blm.gov/wildlife/plan/pl\\_15\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_15_10.pdf)).

## **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

Hamel, Paul B. 2000. Cerulean Warbler (*Dendroica cerulea*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/511>.

National Research Council (U.S) Committee on Environmental Impacts of Wind-Energy Projects. 2007. Environmental impacts of wind-energy projects. National Academies Press. 376 pages.

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

NYSDEC. 2010. Cerulean warbler fact sheet. (<http://www.dec.ny.gov/animals/59560.html>).

Rosenberg, Kenneth V., Sara E. Barker, and Ronald W. Rohrbaugh. 2000. An Atlas of Cerulean Warbler Populations. Final Report to USFWS: 1997–2000 Breeding Seasons. Cornell Lab of Ornithology, Ithaca, NY. December, 2000.

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

USFWS. 2007. A Conservation Action Plan for the Cerulean Warbler (*Dendroica cerulea*) produced for the USFWS, Division of Migratory Bird Management Focal Species Program. Revised version – 30 June 2007.

Existing strategies for cerulean warbler restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003). [http://www.partnersinflight.org/bcps/pl\\_15sum.htm](http://www.partnersinflight.org/bcps/pl_15sum.htm).
- Partners in Flight North American Landbird Conservation Plan [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/).
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
- Conservation Action Plan for Cerulean Warbler (USFWS 2007).



## **Cerulean Warbler (*Dendroica cerulea*): Finger Lakes Onondaga Focal Area**

[http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/  
CeruleanWarbler.pdf](http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/CeruleanWarbler.pdf).

# Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area

## Chittenango Ovate Amber Snail Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

*Other species benefitting:* NA

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The Chittenango ovate amber snail (COAS) is a terrestrial species that comprises one extant population at Chittenango Falls in central New York. The taxon was first discovered at Chittenango Falls in August 1905 by a field party from the Academy of Natural Sciences of Philadelphia. Its habitat lies within a ravine at the base of one 167-foot waterfall, and the ledges where it is found comprise an early successional sere that is periodically rejuvenated to a bare substrate by floodwaters. The COAS appears to be an obligate calciphile and is found within the spray zone adjacent to the Falls. Clean water may be necessary to maintain essential habitat; however, any effects of water quality on this snail are most likely indirect. Much is still unknown about the species' particular biological and physical needs.

The initial recovery plan for COAS was completed in March 1983. Although some progress toward recovery has been made since its listing, the species remains subject to environmental and stochastic events; of particular concern is another snail, *Succinea* Sp. B, which was possibly introduced from Europe and has an undefined negative interaction with COAS. The U.S. Fish and Wildlife Service's (USFWS) 2006 revised recovery plan focuses on these issues and recommends strategies for addressing them.

**Justification for species selection:** The COAS is Federally-listed as threatened (listed in 1978) and was listed as endangered by the State of New York in 1977. The New York Field Office (NYFO) is the USFWS's national lead office for the species. The most recent 5-year review (USFWS 2006) recommended the COAS be uplisted to endangered.

**State contribution to overall species population:** The entire known range of the COAS is located at one site in Madison County, New York. 2009 population estimates were 339.2 +/- 52.85.

#### **Threats and threat assessment:**

Threats<sup>5</sup> (See Service 2006 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** The only known habitat is protected from direct threats.

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<sup>5</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area**

- A. Human disturbance.
- B. Indirect effects from water quality (not considered a significant threat).

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
NA

**Factor C. Disease or predation:** Predation at low levels may be occurring.

**Factor D. The inadequacy of existing regulatory mechanisms:** NA

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Competition from invasive snail Sp. B.
- B. Single population.
- C. Natural disasters like flooding and rockslides.

### ***Recovery Goals***

***Range-wide Recovery Goal:*** To establish long-term sustainability of the species in the wild.

### ***Range-wide Recovery Objectives:***

- Interim - Stabilize COAS in the wild and in captivity
- Long-term - delist the species

***Conservation goal(s) for New York State:*** Same as range-wide goals.

### **Research/Actions needed:**

- A. Establish long-term monitoring protocol for subsequent surveys at Chittenango Falls (based on recommendations from State University of New York-College of Environmental Science and Forestry [SUNY-ESF]) (Recovery Action 2.1.1)
  - 1. Revise the mark-release-recapture surveys from 2003-2005 and 2007-2010 to minimize human impacts to the COAS and its habitat.
  - 2. Implement annual surveys based on the newly developed protocols (Who: NYFO or contract)
- B. Conduct surveys based on monitoring protocols in occupied habitats (Recovery Action 2.1.3)

# Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area

1. Conduct COAS surveys every other week in summer (June-Sept) FY2010 - (Who: NYFO and volunteers) – completed
  2. Enter data into Excel (FY2011, volunteer) (Endangered Species [ESA])
  3. Enter data into Program MARK (FY2011, volunteer) (ESA)
  4. Using survey results and other pertinent data, conduct a population viability assessment (PVA) for COAS (FY2011) (Who: USFWS-Fisheries) (ESA)
- C. Expand data on the biological and environmental requirements of *Novisuccinea chittenangoensis*. (Recovery Action 3)

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Revised recovery plan completed 2006 (USFWS 2006a)
- Last 5-year review completed 2006 (USFWS 2006b)
  - Complete 5-year review (FY2011) (ESA)
- Spotlight Species Action Plan
  - Develop Plan FY2010 (Who: NYFO) - completed

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Expand data on the biological and environmental requirements of *Novisuccinea chittenangoensis* (Recovery Action 3)
1. Determine if *Succinea* Sp. B is having a negative impact on *Novisuccinea chittenangoensis* (Recovery Action 3.1) Preliminary research conducted in 2009 regarding the interaction of COAS and Sp. B (SUNY-ESF funded through coop agreement with NYFO)
    - a. Review results and discuss potential next steps with SUNY-ESF and partners (FY2012) (Who: Recovery Team)
- B. Research techniques for removal of *Succinea* Sp. B from *Novisuccinea chittenangoensis*' habitat at the Falls (Recovery Action 4)

## **Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area**

1. Preliminary research conducted in 2009 regarding the interaction of COAS and Sp. B (SUNY-ESF funded through coop agreement with NYFO)
  - a. Review results and discuss potential next steps with SUNY-ESF and partners (FY2012) (Who: Recovery Team)
- C. Establish and refine the *Novisuccinea chittenangoensis* captive propagation program (Recovery Action 5.2)
  1. Develop an initial captive propagation protocol (Recovery Action 5.2.1)
    - a. Genetics research is underway to assist with captive rearing (U.S. Geological Survey [USGS] Leetown funded by Quick Response)
      - i. Pursue final results of genetics research from USGS (Who: NYFO ESA)
      - ii. Invite USGS to captive management workshop FY2011 (ESA)
  2. Conduct research experiments to refine rearing protocols (Recovery Action 5.2.3).
    - a. Captive rearing methodologies are being investigated (USGS Leetown funded by FY 08 Quick Response)
      - i. Pursue final results of captive methodology development from USGS (ESA)

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Ensure consideration of habitat protection in any activities of Chittenango Falls State Park (Park) personnel (Recovery Action 2.2.1)
- B. Inhibit or prevent, when possible, human-induced alterations that may adversely affect the snail's habitat at Chittenango Falls (Recovery Action 2.2.2)
  1. Provide input into State and Federally-permitted activities that involve Chittenango Creek upstream of the Falls, as well as other permitted activities that may impact water quality in the Creek (CPA, EC, ESA)
- C. Continue to restrict access to the population and habitat at Chittenango Falls (Recovery Action 2.2.3)

## **Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area**

1. Provide assistance to New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) managers of the property as needed to minimize potential human disturbance at the site.

- D. Develop a *Novisuccinea chittenangoensis* management/protection agreement for Chittenango Falls (Recovery Action 2.2.4) (Who: NYSOPRHP with assistance from NYFO, New York State Department of Environmental Conservation [NYSDEC]).

### **Factor B. Other natural or manmade factors affecting its continued existence:**

- A. Continue to protect the *Novisuccinea chittenangoensis* population and its habitat at Chittenango Falls. (Recovery Action 2)

1. See Factor A actions above.

- B. As feasible, increase the population size and broaden the distribution of the COAS (Recovery Action 5.).

1. Establish and refine captive propagation program (many steps associated with this) (Recovery Action 5.2)

- a. [Apply for Preventing Extinction grant \(ESA\).](#)
- b. Establish and maintain the captive-propagation program (dependent upon funding). (ESA)
  - i. Conduct necessary research (See above)
  - ii. [Conduct a workshop to determine the feasibility of ex situ conservation and craft a captive rearing plan \(FY2011\) \(Who: NYFO ESA and Recovery Team, Cost: 5-10K\)](#)
  - iii. [Determine interested facilities \(FY2011\) \(ESA\)](#)
  - iv. Initiate implementation of the captive rearing plan at 1-2 facilities.
  - v. [Complete necessary contracts or cooperative agreements. \(ESA\)](#)
  - vi. Provide founders, track captive snail numbers, and survival, provide snails to return to the wild (Costs TBD at workshop)
  - vii. Monitor success of pilot program (Who: graduate student)
2. Introduce COAS to one or more additional sites at Chittenango Falls (dependent on funding and timing of funding announcements) (ESA)

## **Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area**

- a. Conduct habitat surveys to determine the habitat suitability at alternative sites at Chittenango Falls for possible establishment of an additional COAS colony. Identify the most suitable site[s] for translocation of wild COAS and/or release of captive-reared COAS.
- b. Develop an experimental design for introducing snails to the selected site[s], using an adaptive management approach including controls and monitoring protocols.
- c. Implement introduction of snails to the new site[s] in accordance with the experimental design.

### **OUTREACH**

Establish an information and education system conducive to achieving other recovery actions  
Potential options: signage, fact sheets at the Park and Rosamond Gifford Zoo (Recovery Action 2.2)

Provide information to Park patrons and the local community as to the presence of the species and to acquaint them with regulations for its protection (Recovery Action 2.3.2). Assist with development of materials for the public at the Park and at the Rosamond Gifford Zoo.

Develop and fund printing a second COAS t-shirt (new phrase?); new artwork will emphasize habitat.

### **MONITORING**

Review and track recovery progress (Recovery Action 6).

Monitor success of pilot captive program.

#### *Partners*

Rosamond Gifford Zoo, Syracuse, New York  
Other zoos  
NYSDEC  
SUNY-ESF, Syracuse, New York  
NYSOPRHP  
USGS

#### *References*

U.S. Fish and Wildlife Service. (2006a). Chittenango ovate amber snail recovery plan.  
<http://www.fws.gov/northeast/nyfo/es/COASplan051006.pdf>

## **Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*): Finger Lakes Onondaga Focal Area**

U.S. Fish and Wildlife Service. (2006b). 5-year review for Chittenango ovate amber snail. [http://ecos.fws.gov/docs/five\\_year\\_review/doc1011.pdf](http://ecos.fws.gov/docs/five_year_review/doc1011.pdf)

U.S. Fish and Wildlife Service. (2010). Chittenango ovate amber snail (*Novisuccinea chittenangoensis*) Spotlight Species Action Plan



# Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

## Indiana Bat Species Action Plan

### FOCAL AREA: FINGER LAKES/ONONDAGA

*Other species benefitting:*

eastern small-footed, little brown, tri-colored, northern, big brown

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h (diameter at breast height). Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at <http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf>.

Streams associated with floodplain forests and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (e.g., old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service [USFWS] 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

**Justification for species selection:** The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

**State contribution to overall species population:** New York used to have ~11% of wintering Indiana bats rangewide before White-nose syndrome (WNS). New York still has the largest number of wintering (and likely summering) Indiana bats in the region. The USFWS has

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

proposed recovery units in the draft recovery plan (Plan) (USFWS 2007) and New York is part of the Northeast Recovery Unit.

### Threats and threat assessment:

Threats<sup>6</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** *See the Plan for in-depth discussion (USFWS 2007, page 71).*

- A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) have been identified as long-standing and ongoing threats to the species.
- B. Winter – potential to impact hibernacula with gas drilling, filling, etc.
- C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development
- D. Fall (swarming) – same pressures as spring/summer habitat

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

*See the Plan for in-depth discussion (USFWS 2007, page 80).*

Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

**Factor C. Disease or predation:** WNS is most significant threat in New York. Predation is also a threat.

**Factor D. The inadequacy of existing regulatory mechanisms:** *See the Plan for in-depth discussion (USFWS 2007, page 90).*

Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

**Factor E. Other natural or man-made factors affecting its continued existence:** *See the Plan for in-depth discussion (USFWS 2007, page 91).*

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<sup>6</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

- A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.
- B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and polychlorinated biphenyls [PCBs]), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

### *Recovery Goals*

**Range-wide Recovery Goals/Objectives:** Intermediate - reclassification, Long-term - delisting

**Conservation goal(s) for New York State:** The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit.

### **Research/Actions needed:**

- A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions – not included in recovery plan – WNS will eventually have a separate plan).
- B. WNS-related research is needed to better understand the threat.
  - 1. Assist with requests for proposals (RFPs) as requested (Endangered Species Act [ESA]).
  - 2. Review proposals if requested to be on review team (ESA).
  - 3. Provide grant oversight for FY08 and FY09 projects (FY2011-2012) (ESA).
  - 4. Assist with field work (FY2011) (ESA).
- C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6)
  - 1. Assist with Indiana bat modeling shared decision-making (SDM) effort until completion (ESA)
    - a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3) (FY11)
    - b. Participate in calls during Beta testing (FY11)
    - c. Attend workshop to test model (FY11)
    - d. Assist with roll-out of model (FY11)

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

- e. Provide technical assistance to Field Offices (FOs) with use of model (FY11,12,13)
- D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4)
  1. Environmental Contaminants (EC) WNS research - send all samples out for analysis (FY11, EC)
  2. Prepare 2009 bat mercury Natural Resource Damage Assessment and Restoration (NRDAR) report for Onondaga Lake (FY11, EC)

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (USFWS 2007)
- Last 5-year review completed 2009 (USFWS 2009)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Assist R3 with finalizing Recovery Plan as requested (FY11, NYFO ESA)
- B. Reduce current threats at known hibernacula (primarily WNS-related actions - not included in recovery plan - WNS will eventually have a separate plan) (Recovery Action 1.1.1)
  1. WNS National Plan
    - a. Provide technical assistance during USFWS and/or public review periods (FY2011) (ESA)
    - b. Participate in Communications Group (FY2011,12,13, NYFO ESA)
  2. WNS-related research is needed to develop conservation strategies to respond to WNS.
    - a. Assist with captive bat management structured decision making process (FY10, 11, NYFO ESA)
- C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.
  1. Participate in multi-region project to develop guidance (FY10,11, NYFO ESA)

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

2. Coordinate first R3, Regions 4 and 5 (R4, R5) threatened and endangered species wind call - 2/3 (FY10)[completed]
  3. Participate in multi-region calls (FY10-13, NYFO ESA)
- D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)
1. Assist R3 with this effort
- E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)
- F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)
1. Assist with funding automation of acoustic survey data analysis
    - a. participate in Regional WNS funding discussions and promote funding of acoustic automation system (FY10,11) (ESA)
    - b. assist with Phase 1 grant agreement (FY10)[completed]
  2. Determine whether netting guidelines should be revised to include acoustic detectors
    - a. Participate in Indiana bat/Wind Initiative protocol workgroup (FY10)[completed]
    - b. Participate in team to revise Indiana bat survey protocols as requested (FY11) (ESA)
  3. Assist New York State Department of Environmental Conservation (NYSDEC) with acoustic transect project
    - a. Conduct 1 acoustic transect route 2-3 nights (FY10)[completed]
    - b. Conduct 1 acoustic transect route 2-3 nights (FY11, NYFO any program; ESA to coordinate)
- G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)
1. Fund or otherwise coordinate wind project research
    - a. Flight altitude?
    - b. Migratory pathways?
    - c. Impacts of wind turbines on resident v. migrating bats?
    - d. Minimization/mitigation measures?

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

- e. Post-construction monitoring techniques?

### H. Regional coordination role

1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads (FY11) (ESA)
2. Potential outcomes:
  - a. Provide updates to FOs on literature, information from other regions
  - b. Provide technical assistance to FOs on formal consultations/Habitat Conservation Plans (HCPs)
  - c. Provide R5 comments on national issues (e.g., survey protocol updates)
  - d. Provide R5 end-of-year reporting info to R3
  - e. Maintain understanding of current literature
  - f. Participate in WNS-related projects as needed

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

### Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

- A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)
  1. Army Compatible Use Buffer (ACUB) program has been initiated at Fort Drum. This is a great opportunity to target lands for protection that meet Town, Army, and conservation goals. Partners include Army, Ducks Unlimited (DU), Ontario Bays Initiative (OBI), NYSDEC
    - a. Participate in meetings/calls to target Indiana bat lands (FY11-13) (ESA)
    - b. Provide technical assistance to Fort Drum with easement language (FY11, NYFO ESA)
    - c. Complete consultation on ACUB program (FY11, NYFO ESA)
- B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)
  1. Fort Drum
    - a. Ensure implementation of conservation measures of existing Biological Opinion (BO) (also see Action 2.6)

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

- b. Participate in semi-annual Natural Resources Branch Meetings
    - i. Attend at least one in person and one over the phone (FY10,11,12) (ESA)
  - c. Recognize the Army for assisting with recovery actions
    - i. Nominate for Military Partnership Award - January 2010 (FY10)[completed-not awarded]
    - ii. Send recognition letter to Army (FY11) (ESA)
  - d. Assist Fort Drum with WNS research/monitoring
    - i. Assist with summer transmission study
      - Assist with capture and processing of bats at condo 1-3 nights (FY10,11, NYFO ESA)
- C. Encourage habitat protection through acquisition/easements
- 1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants
  - 2. Provide technical assistance to the Natural Resources Conservation Service (NRCS) for potential easements
- D. Minimize adverse impacts to Indiana bat during project reviews (Recovery Action 2.6)
- 1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor
    - a. Review annual reports from
      - i. Fort Drum (FY10-13, NYFO ESA)
      - ii. Fort Drum Connector (FY10,11,12, NYFO ESA)
  - 2. Habitat protection through informal and formal consultations and HCPs (NYFO ESA).
    - a. Assist with development of measures for NiSource HCP (ESA)
    - b. Develop conservation framework, including standard conservation measures, for residential and commercial projects (ESA)
    - c. Complete St. Lawrence Wind consultation (ESA)
    - d. Participate in consultation with Fort Drum (FY2011, NYFO ESA)

## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** No work planned for FY 2011.

**Factor C. Disease or predation:** Need to determine what conservation measures will be available for WNS-response.

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Review NYSDEC permit conditions (FY11) (ESA)
- B. Coordination Regional review of Indiana bat permit conditions (ESA)

**Factor E. Other natural or man-made factors affecting its continued existence:** Wind project work being addressed through consultations/HCPs (see above)

### OUTREACH

- A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat including development of guidelines, best management practices (BMP), land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)
- B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)
  - 1. Current Indiana bat/WNS display
    - a. Continue to rotate display at nature center (any NYFO program; ESA to coordinate)
    - b. Update display at least once/year (ESA)
  - 2. New Indiana bat display
    - a. Provide technical assistance to the U.S. Forest Service (USFS) in the development of a new display (ESA)
    - b. Receive transfer funding from USFS and develop contracts to complete display (FY2011, Cost:\$10-15,000 [\$5,000 from USFS, rest from WNS and NYFO]) (ESA)
  - 3. New Indiana bat cave display
    - a. Develop new cave display (FY2012, Cost: \$1000)



## Indiana Bat (*Myotis sodalis*): Finger Lakes Onondaga Focal Area

4. Attend meetings/workshops
- C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)
  1. [Update Fact Sheets and web materials \(NYFO ESA and R5\) \(FY10,11\)](#)
- D. Assist with Freedom of Information Act (FOIA) responses as needed

### MONITORING

- A. Survey winter populations of Indiana bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)
  1. Assist NYSDEC with 2010 hibernacula surveys (FY10)[completed]
    - a. Glen Park
  2. [Assist NYSDEC with “Indiana bat on year” winter 2010-2011 surveys \(FY11\) \(ESA, staff costs\)](#)
    - a. [Glen Park \(St. Lawrence focal area\)](#)
- B. Review and track recovery progress.

### *Partners*

Partners - NYSDEC, R3, R4, R5 FOs, Montezuma National Wildlife Refuge (NWR), U.S. Army, USFS, New York State Department of Transportation (NYSDOT), Federal Highway Administration (FHWA), OBI, DU, USGS

### *References*

U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 600 pp. (This document has been peer-reviewed and is available at <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.

# Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

## Lake Sturgeon Species Action Plan

### FOCAL AREA: FINGER LAKES/ONONDAGA LAKE

#### *Other species benefitting:*

walleye, redhorse/white suckers, American eel

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Lake sturgeon is a long-lived, late-maturing species that inhabits large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins. Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warm water species with water temperature and depth preferences of low 50s to mid-60°F and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Life history characteristics of lake sturgeon are unique with respect to other fishes. Females mature between 14 and 33 years, males between 8 and 12 years. Spawning occurs only once every 2-7 years for males and 4-9 years for females. As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population spawns during a given season. Spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-60°F. The typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

**Justification for species selection:** In the past, sturgeon have comprised an important biological component of the Great Lakes fish community. By the early 1900s many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and reduced water quality. Within the Great Lakes basin, the lake sturgeon population is estimated to be at 1% of historic abundance levels. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. In New York State and the Province of Ontario, lake sturgeon are listed as a threatened species. In addition, the lake sturgeon is a Federal trust species.

**State contribution to overall species population:** Currently there are remnant populations of lake sturgeon occurring in Upper Niagara River/Lake Erie, Lower Niagara River, St. Lawrence River (middle corridor), St. Lawrence River (lower corridor), and the Grasse River. Among these remnant populations we see varying population trends, ranging from populations that are recovering to populations that remain very low but apparently stable. Within the State, the populations maintaining themselves today are recognized as being in five geographic units, contrasted to more than 12 units historically. The New York State Department of Environmental Conservation (NYSDEC) Lake Sturgeon Recovery Plan states the goal of maintaining these 5 units and restoring populations in three other units. The NYSDEC has stocked 6 waterbodies in efforts to establish populations in three other units. Lake sturgeon have been reintroduced into

# Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

Cayuga Lake and Oneida Lake; these sturgeon have been shown to disperse with individuals being captured in Onondaga Lake.

## Research needed:

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC, U.S. Geological Survey [USGS], Ontario Ministry of Natural Resources [OMNR], and U.S. Fish and Wildlife Service [USFWS], Lower Great Lakes Fish and Wildlife Conservation Office/New York Field Office [LGLFWCO/NYFO] to assist with lake sturgeon surveys to determine presence/absence and population densities, coupled with habitat investigation and evaluation of stocking initiatives; Cost: NYFO staff time)

- Complete a New York State Lake Sturgeon Management Plan.

(Who: USFWS [NYFO], NYSDEC, USGS, and Cornell University to assist with completion of New York State Lake Sturgeon Management Plan to address recovery, habitat restoration strategies, and population goals; Cost: < \$30K, NYFO Fish Enhancement, Mitigation, and Research Fund [FEMRF] funding)

## Threats and threat assessment:

### 1. Loss of spawning habitat.

#### Research needed:

- Conduct surveys to determine quantity and quality of known spawning habitat.

(Who: NYSDEC, USGS, USFWS [NYFO], State University of New York-College of Environmental Science and Forestry [SUNY-ESF]; Cost: NYFO staff time)

- Identify and prioritize areas for habitat restoration and enhancement.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, Natural Resource Damage Assessment and Restoration [NRDAR] funding)

### 2. Barriers to Migration (including dams and impassable culverts).

#### Research needed:

- Identify barriers having an influence on lake sturgeon spawning migration and prioritize barrier removal.

# Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, NRDAR funding)

- Conduct surveys to determine available sturgeon spawning habitat above existing barriers, in regards to both quantity and quality of habitat present.  
(Who : NYSDEC, USGS, USFWS [NYFO] ; Cost: unknown at this time, NRDAR funding)

### 3. Contaminants.

#### Research needed:

- Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically the effects from PCBs, mercury, and emerging contaminants.

(Who: USFWS [NYFO-Environmental Contaminants (EC)]; Cost: unknown at this time, NRDAR, Great Lakes Restoration Initiative [GLRI] funding)

### 4. Invasive Species (and associated disease transmission).

#### Research needed:

- Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.

(Who: USGS, academics; Cost: unknown at this time)

### 5. Climate change; changes in riverine discharge regimes.

#### Research needed:

- Identification of climate change related impacts to lake sturgeon.

(Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

#### *Partners/potential funding*

USFWS (LGLFWCO), USGS, Onondaga Nation, NYSDEC, Cornell University

#### *Population goal(s) for New York State:*

Currently, several agencies have published three population goals for lake sturgeon in the Lake Ontario/St. Lawrence River basin and these goals vary. The NYSDEC Lake Sturgeon Recovery

# Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

Plan states the goals are to increase the number of naturally reproducing sturgeon populations in New York to 8 (up from 5) and the removal of the species from State-listing. The Great Lakes Fishery Commission stated goals are the rehabilitation of lake sturgeon populations including the expansion of sturgeon populations into favorable habitats and to enhance sturgeon spawning habitat. Their metric for success is based on a catch per unit effort (CPUE) of 0.1 sturgeon/net/night; CPUE rates observed from 2000 to 2007 ranged from 0 to 0.06 sturgeon/net/night. The OMNR, in a draft Lake Sturgeon Rehabilitation Plan, state goals as conserve and/or rehabilitate the existing self-sustaining lake sturgeon spawning populations with a minimum target of at least 750 sexually mature sturgeon in each system. This number was selected because it represents the minimum number thought to be present in remnant Great Lakes populations that are considered to be either stable or increasing in abundance. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Finger Lakes/Onondaga Lake focal area.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of spawning habitat**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
- b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (Partners for Fish and Wildlife [PFW]).
- c. Promote habitat restoration projects that control sediment entering riverine environments and reduce quality of spawning habitat.
- d. Conduct surveys to determine current population levels and presence/absence.
- e. Facilitate reintroduction of lake sturgeon to their known former range.

#### **2. Barriers to migration (including dams and impassable culverts).**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
- b. Work with partners to identify, prioritize, and remove sturgeon barriers
- c. Work with partners, to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.

# Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

## 3. Contaminants.

- a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically polychlorinated biphenyls (PCBs), mercury, and emerging contaminants.
- b. Continue to manage Onondaga Lake NRDAR case; consider restoration options that benefit lake sturgeon.
- c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

## 4. Invasive Species (and associated disease transmission)

- a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.

## 5. Climate change; changes in riverine discharge regimes.

- a. Identify potential effects to lake sturgeon spawning habitat and water quality.

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY2010-2012

### 1. Loss of spawning habitat and habitat function.

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
  - i. [Providing substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon \(Conservation Planning Assistance \[CPA\]\).](#)
- b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements.
  - i. [Work with NYSDEC, to begin to identify opportunities for the placement of spawning substrate beds in Nine-Mile Creek and Onondaga Creek as a NRDA restoration opportunity \(NRDAR funding\) \(EC\).](#)
- c. Promote habitat restoration projects which also control sediment entering riverine environments.

## Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

- i. Work with U.S. Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS] to focus their programmatic efforts to reduce sediment input and agricultural run-off (USDA-NRCS funding).
  - d. Conduct surveys to determine current population levels and presence/absence.
    - i. Assist the NYSDEC/USGS with surveys to determine current population levels and presence/absence.
  - e. Facilitate reintroduction of lake sturgeon to their known former range.
    - i. Facilitate the writing of a New York State Lake Sturgeon Management Plan (FEMRF funding) (NYSDEC, USGS, FEMRF).
    - ii. Assist the NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation. NYFO-FEMRF to provide equipment, assistance with Investigational New Animal Drugs (INAD) permits, and field assistance. Gametes collected from St. Lawrence River. (FEMRF funding) (FEMRF).
- 2. Barriers to migration** (including dams and impassable culverts).
  - a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
    - i. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA).
  - b. Work with partners to prioritize, identify, and remove sturgeon barriers.
    - i. Work with NYSDEC to prioritize, identify, and remove barriers.
  - c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.
    - i. Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range (NYSDEC, FEMRF).
- 3. Environmental contaminants.**
  - a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants.

## **Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area**

- i. Facilitate the investigation of the effects of contaminants on the survival and reproductive success of lake sturgeon (dependent on funding – NRDAR (not DOI trust resource), GLRI funding – indirect benefit from Genesee River work).
- b. Continue to manage Onondaga Lake NRDAR case.
  - i. Work with partners and fellow trustee agencies to restore habitat using NRDAR funds associated with Onondaga Lake (CPA).
- c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to lake sturgeon and/or their habitat (CPA).

### **4. Invasive species (and associated disease transmission).**

- a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.
  - i. No work identified at this time.

### **5. Climate change; changes in riverine discharge regimes.**

- a. Identify potential effects to lake sturgeon spawning habitat and water quality
  - i. Work with National Weather Service to create models for determining climate change related precipitation impacts to spawning habitat and tributaries.

## **OUTREACH**

The New York State Lake Sturgeon Recovery Plan (pending), when complete, will have an outreach component identifying our path forward.

The NYFO has an EC webpage with “ongoing projects” on our website.

Assist NYSDEC with lake sturgeon placard placement and fisherman education.

## **MONITORING**

- Work with partners to monitor lake sturgeon habitat restoration and enhancement projects, including spawning substrate additions and use of habitat post-removal of barriers.



## Lake Sturgeon (*Acipenser fulvescens*): Finger Lakes Onondaga Focal Area

- Monitor status and contribution to the population of stocked eggs/sturgeon as part of reintroduction strategy.
- Establish benchmarks for success based on New York State Lake Sturgeon Management Plan (pending).

### *Partners*

USFWS/LGLFWCO, USGS, Onondaga Nation, NYSDEC, SUNY-ESF, Cornell University.

### *References*

Bouton, D. 1994. A Recovery Plan for Lake Sturgeon (*Acipenser fulvescens*), NYSDEC publication.

Carlson, D. 2000. A Recovery Plan for the Lake Sturgeon in New York State, NYSDEC publication, updated.

LaPan, S.R., A. Mathers, T.J. Stewart, R.E. Lange, S.D. Orsatti. 2002. Fish-Community Objectives for the St. Lawrence River. Great Lakes Fish. Comm. Spec. Pub. 2002 <http://www.glfco.org/lakecom/loc/slrfo>.

Farrell, J.M., R. Colesante, D. Dittman, J. Johnson. 2009. Lake Sturgeon Population Enhancement as a Strategy for Improvement of Ecosystem Function and Controlling Invasive Species. Final Report. Submitted to the USFWS in fulfillment of a FEMRF award.

# Leedy's Roseroot (*Sedum integrifolium* spp. *leedyi*): Finger Lakes Onondaga Focal Area

## Leedy's Roseroot Species Action Plan

### FOCAL AREA: FINGER LAKES/ONONDAGA

#### *Other species benefitting:*

Northern maidenhair-fern, wild columbine, lyre-leaved rockcress, maidenhair spleenwort, American harebell, rock whitlow-grass, bulbet fern, Northern bush-honeysuckle, herb-robert, American water-pennywort, spotted jewelweed, true forget-me-not, broad beech fern, three-leaved rattlesnake root, bristly buttercup, skunk currant, northern woodsia, and blunt-lobe woodsia

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Leedy's roseroot is a succulent plant that is found only in very specialized cliffside habitats that are cool and moist (Olfelt *et al.* 1998). The largest extant population of Leedy's roseroot occurs almost continuously along 3.2 km of Seneca Lake at Glenora Cliff. Plants occur on east-facing cliffs at elevations between 136 and 141 m from near the tops of the cliffs to the talus. These lakeside cliffs are thinly bedded shale with intermittent thicker beds of siltstone. Soil pH ranges from 6.8 to 7.5. Drainage is good to poor, and most of the cliff face is dry. The largest concentration of Leedy's occurs in seepage areas, which may or may not remain moist throughout the year. Plants rooted in drier free-standing rock pillars are wilted. In sheltered areas behind boathouses, plants occur on the talus itself. Leedy's is a perennial plant that flowers in late June. Newer plant growth on long-lived rootstocks can break off to form clones, although this is rare based on genetic analyses.

A 0.4 hectare portion of the Glenora Cliff site, which contains 60 to 70 clumps of plants, is protected by the Finger Lakes Land Trust (FLLT) with a conservation easement held by The Nature Conservancy (TNC).

**Justification for species selection:** Leedy's roseroot has been Federally-listed as threatened since 1992 and is State-listed as threatened. Major threats include natural rarity of species due to specific habitat requirements and habitat alteration. Although U.S. Fish and Wildlife Service (USFWS) Region 3 has overall species lead, the New York Field Office (NYFO) is Region 5 lead. Leedy's is only found in Minnesota and New York.

**State contribution to overall species population:** Currently there are only three locations in New York where Leedy's is present. Glenora Cliff and Glenora Falls in Yates County and Watkins Glen in Schuyler County. Over 4,000 plants have been counted along a 3.2 km stretch at Glenora Cliff. This site has the largest population rangewide and appears to be relatively stable since the 1980s. Approximately 40 plants are located on private land at Glenora Falls which has not been recently surveyed. A single plant is known from the Watkins Glen site and was likely introduced to this location.

# Leedy's Roseroot (*Sedum integrifolium* spp. *leedyi*): Finger Lakes Onondaga Focal Area

## Threats and threat assessment:

Threats<sup>7</sup> (See Recovery Plan):

### Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

- A. Groundwater contamination – this can occur after fertilizers and pesticides are applied to nearby fields or lawns or after sinkholes are used as dump sites.
- B. Hydrologic alterations
- C. Staircase construction and water pipes

### Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

NA

### Factor C. Disease or predation:

Unknown

### Factor D. The inadequacy of existing regulatory mechanisms:

NA

### Factor E. Other natural or manmade factors affecting its continued existence:

- A. Specific habitat requirements – this species is naturally limited and disjunct in existence due to specific habitat needs. Low population numbers could severely impact genetic diversity.
- B. Rock slides
- C. Erosion – stochastic events could severely impact genetic diversity.
- D. Invasive species – the weedy non-native Japanese knotweed (*Polygonum cuspidatum*) exhibits abundant growth on talus throughout the northern half of Glenora Cliff obscuring Leedy's and the cliff face. Swallow-wort (*Cynanchum rossicum*) is newly encroaching the southernmost portion of the Glenora Cliff site.

## ***Recovery Goals***

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<sup>7</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# Leedy's Roseroot (*Sedum integrifolium* spp. *leedyi*): Finger Lakes Onondaga Focal Area

**Range-wide Recovery Goals/Objectives:** To delist the species. Protected populations must be geographically distinct and must represent the taxon's full range of genetic variability.

**Conservation goal(s) for New York State:** To consider delisting, the Glenora Falls population must be protected; habitat for 4,000 plants in multiple sites, evenly distributed along a 2-mile stretch of Glenora Cliff, is protected. The two most distant subpopulations protected at Glenora Cliff must be at least 1.5 miles apart; protected populations must be self-sustaining, and have been protected for five consecutive years by measures that will remain effective following delisting.

## Research/Actions needed:

Map populations (Recovery Action 1.1) and implement a uniform monitoring procedure (Recovery Action 5.2)

- 2005 survey was completed at Glenora Cliffs and Glenora Falls - population areas have been geolocated.
- Census should be done at least every 5 years
  - Next survey is 2010 (completed).
    - New York applied for Section 6 (S6) funds (completed).
    - Assist with field work (1-2 days) (completed).
    - [Obtain 2010 data from the New York Natural Heritage Program \(NYNHP\) \(USFWS Endangered Species \[ESA\], Cost: staff time\)](#)
    - Update GIS with new population data (USFWS ESA, Cost: staff time)
- Provide survey information to Region 3 for annual Recovery Data Call (RDC) (FY2010) (completed).
- Provide future information to Region 3 for RDC (annual).

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan 1998
- 5-year review initiated (check status of 5-year review)
  - Next 5-year review anticipated in 5 years

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Evaluate potential invasive species (specifically Japanese knotweed and swallow-wort) impact on Leedy's (Partners: Steve Young-NYNHP, FLLT; Cost: staff time) (ESA)
- B. Evaluate impacts of climate change on Leedy's.

# Leedy's Roseroot (*Sedum integrifolium* spp. *leedyi*): Finger Lakes Onondaga Focal Area

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

No work planned in next 2-3 years.

### **Factor B. Other natural or manmade factors affecting its continued existence:**

No work planned in next 2-3 years.

## OUTREACH

Develop and post a fact sheet on Leedy's roseroot on NYFO website (Cost: staff time) (ESA)

## MONITORING

Monitor the success of invasive species control activities should they be implemented.

### *Partners*

NYNHP, New York State Department of Environmental Conservation, FLLT

### *References*

Olfelt, J.P., G.R. Furnier, and J.J. Luby. 1998. Reproduction and development of the endangered *Sedum integrifolium* ssp. *Leedyi* (Crassulaceae). *American Journal of Botany*. 85(3): 346-351.

U.S. Fish and Wildlife Service. 1998. *Sedum integrifolium* ssp. *Leedyi* (Leedy's roseroot) Recovery Plan. Ft. Snelling, Minnesota. vi + 31 pp.

# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Finger Lakes Onondaga Focal Area

## Massasauga Rattlesnake Species Action Plan

### FOCAL AREA: FINGER LAKES/ONONDAGA

#### *Other species benefitting:*

Spotted turtle, mountain holly, highbush blueberry, leatherleaf, black spruce, American larch, and European birch

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The eastern massasauga rattlesnake (EMR) is a Federal candidate species and a New York State-listed endangered species. Habitat: Early successional plant communities, open ponds, marshes, peatlands, old fields, and shrublands. Due to threats and its natural patchy distribution within its range, this sub-species is listed as endangered in New York and conservation efforts are being lead by state biologists. The New York role includes assisting the New York State Department of Environmental Conservation (NYSDEC) with Cicero Swamp Wildlife Management Area (CSWMA) and Bergen Swamp Conservatory with protection and habitat management of Bergen-Byron Swamp and adjacent lands.

**Justification for species selection:** The eastern massasauga rattlesnake is a Federal Candidate species and our goal is to preclude listing the species. Due to threats and its natural patchy distribution within its range, the sub-species is listed as endangered in New York.

**State contribution to overall species population:** Two known populations – SWMA in Onondaga County and Bergen-Byron Swamp in the Towns of Byron and Bergen, Genesee County. CSWMA is a 2,024 hectare (ha) wetland complex owned and managed by NYSDEC that supports forested wetlands, open ponds, marshes, old fields and shrubland including a 37 ha peatland that is the primary habitat for the EMR. There are approximately 200 rattlesnakes known to occur in CSWMA and the numbers could increase with habitat management such as prescribed burns, mechanical brush clearing, and herbicide application.

#### **Threats and threat assessment:**

Threats<sup>8</sup>:

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

A. Habitat loss/degradation in the form of:

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<sup>8</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Finger Lakes Onondaga Focal Area**

1. succession of peatlands to closed canopy and forest regeneration
2. wetland filling/drainage and urbanization

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Illegal collecting is a threat.

### **Factor C. Disease or predation:**

- A. Predators include carnivorous species (Johnson 1995) such as “weasels, mink, and coyotes, as well as [birds of prey], owls, and turkey.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. This is a threat and part of the reason for consideration for listing.

### **Factor E. Other natural or manmade factors affecting its continued existence:**

Other threats include:

- A. Genetic viability, loss of genetic diversity due to isolation
- B. Invasive species encroachment
- C. Illegal collecting
- D. Potential impacts from pesticide spraying for mosquito control (State)

### ***Conservation Goals***

***Range-wide Goal:*** Preclude the need to list EMR

***Conservation goal(s) for New York State:***

Determine New York State goal for population

### **Research/Actions needed:**

- State Recovery Plan and status assessment from NYSDEC
- NYSDEC/State University of New York-College of Environmental Science and Forestry (SUNY-ESF) EMR habitat requirements at Cicero (i.e., use of seasonal habitats)
- Other Habitat Management plans (NYSDEC - CSWMA Burn Plan)
- Invasive Species
- Genetics
- Survey sites outside the CSWMA for potential available habitat in New York

*Partners/potential funding*

# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Finger Lakes Onondaga Focal Area

U.S. Army Corps of Engineers (USACE), NYSDEC, SUNY-ESF, grants

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- USFWS Status Assessment for Eastern Massasauga (*Sistrurus c. catenatus*)1998
- NYSDEC Draft Recovery plan (NYSDEC 2009)
- Cicero Burn Plan (NYSDEC 2009)
- State Wildlife Habitat Conservation Plan (NYSDEC 2009)

### **Research or Actions needed:**

Specific actions for the next 3 years addressing conservation design include the following:

- A. Address threat of habitat loss due to succession of peatland to closed canopy, forest regeneration.
  1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied, but suitable habitat.
- B. Address threats of habitat degradation due to invasive species encroachment.
  1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability.
- C. Address loss of habitat due to alternations in wetland hydrology, including wetland draining, urban run-off, and water quality degradation.
  1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands with a focus on wetlands that have suitable habitat.
- D. Address population decline including those due to loss of individual snakes due to illegal collecting.
  1. Develop a reintroduction plan using results of genetics research.
  2. Develop a captive rearing plan.
  3. Develop a plan for enhanced protection of existing population.



# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Finger Lakes Onondaga Focal Area

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012.

### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Threat of habitat loss due to succession of peatland to closed canopy, invasive species, and forest regeneration.
  - 1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied, but suitable habitat.
  - 2. [Respond to Candidate Notice of Review to U.S. Fish and Wildlife Service \(USFWS\) Region 3 \(FY 2011\)\(Sandy\) \(ESA\)](#)
- B. Habitat degradation and loss due to alternations in wetland hydrology, including wetland draining, urban run-off and water quality degradation.
  - 1. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:
  - 2. Develop fact sheets and best management practices to minimize impacts to this species (USFWS-New York Field Office [NYFO]) (Endangered Species [ESA])
  - 3. Post fact sheets/best management practices (BMPs) for this species on our website (NYFO-Information Technology [IT])
  - 4. [Provide substantive comments on proposed actions with potential impacts on this species \(FY 2011\) \(Conservation Planning Assistance \[CPA\], ESA\)](#)

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Address loss of individual snakes due to illegal collecting.

### **Factor C. Other natural or manmade factors affecting its continued existence:**

- A. Threats of habitat degradation due to invasive species encroachment.
  - 1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability at Cicero Swamp.

## **Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Finger Lakes Onondaga Focal Area**

- a. Assist NYSDEC in habitat management in the form of brush cutting, prescribed burning, herbicide use, mowing practices, and vehicular access by reviewing NYSDEC plans for Cicero as needed (i.e., burn plans) (FY 2010 completed)
- b. Provide technical assistance to NYSDEC for Great Lakes Restoration Initiative (GLRI) proposal (FY 2010 completed)
- c. **Grant oversight (FY 2011) (ESA)**
- d. Pursue Candidate Conservation Agreement with Assurances (CCA) with NYSDEC and pursue CCA with R7.
- e. Identify ways to protect habitat outside CSWMA and incorporate buffers.

### **B. Contaminants**

1. Mosquito control pesticides that are sprayed due to Eastern Equine Encephalitis (EEE).
  - a. Work with NYSDEC on draft recovery plan. Consider affects to EMR as a result of aerial spraying.
  - b. Provide technical assistance to Onondaga County and request that they explore alternative mosquito control methods to minimize potential impacts to EMR.

### **OUTREACH**

- Coordinate with NYSDEC, Tom Bell, to design outreach exhibit for use in NY.
- Increase public awareness and knowledge of the species through fact sheets posted on NYFO website.
- Massasauga Rattlesnake USFWS Fact Sheet.

### **MONITORING**

Monitor EMR response to habitat management.

#### *Partners*

NYSDEC, SUNY-ESF (Dr. James Gibbs/K. Shoemaker), Al Breisch, retired NYSDEC

#### *References*

Conservation: [http://www.fws.gov/midwest/Endangered/reptiles/eama\\_qanda.html](http://www.fws.gov/midwest/Endangered/reptiles/eama_qanda.html)

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## **Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Finger Lakes Onondaga Focal Area**

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Johnson, G., A.R. Breisch. 1992. The Eastern Massasauga Rattlesnake in New York: Occurrence and Habitat Management. Metro Toronto Zoo Rattlesnake Symposium

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Shoemaker, K.T. 2007. Habitat manipulation as a viable strategy for the conservation of the Massasauga rattlesnake in New York State. Thesis. State University of New York, College of Environmental Science and Forestry, Syracuse, New York, USA. 111 pp.

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Szymanski, J.A. 1998. Range-wide status assessment for the Eastern Massasauga (*Sistrurus c. catenatus*). U.S. Fish and Wildlife Service, Ft. Snelling, Minnesota. 39 pp.

USFWS websites: Fact Sheet: <http://www.fws.gov/midwest/endangered/reptiles/conserve.html>  
U.S. Fish and Wildlife Service. 2008. Species Assessment and Listing Priority Assignment Form for Eastern Massasauga (*Sistrurus catenatus catenatus*).

## GREAT LAKES FOCAL AREA

The Great Lakes Focal Area (GLFA) is located adjacent to the shores of Lake Erie and Lake Ontario in western and north-central New York and contains 6,118 square miles or 11.2% of the state. The overall boundary is largely demarcated by the Great Lakes watershed that drains immediately into either Lake Erie or Lake Ontario, excluding the Oswego River basin which is part of the Finger Lakes Focal Area, and the Black River basin which is included in the St. Lawrence River Focal Area. The GLFA contains the Lake Erie/Ontario Lake Plain and Ontario Lowlands with a local relief of 20-300 feet, the Cattaraugus Hills with a local relief of 200-500 feet, and the eastern portion of the Tug Hill Plateau with a local relief of 30-300 feet. Overall, elevation ranges within the focal area are 250-900 feet in the Lake Plains and up to 1800-2000 feet in the hills and plateaus. The GLFA is characterized by its association with the glacial and lacustrine landforms associated with the Great Lakes including beach ridges, moraines, and extensive areas of drumlin formation. Additionally, strong seasonal effects associated with the Great Lakes include altered growing season lengths and abundant snowfalls during the winter.

The Great Lakes Basin is the largest surface freshwater system on earth and contains 84% of the freshwater in North America. Covering 13,500 square miles, the basin also supports locally, nationally, and internationally significant fish and wildlife resources. More than 30 million people live within the basin representing 10% of the U.S. and 20% of the Canadian population. All of, or portions thereof, fifteen New York counties are included within the GLFA boundary including Chautauqua, Cattaraugus, Erie, Wyoming, Genesee, Niagara, Orleans, Monroe, Ontario, Wayne, Cayuga, Onondaga, Oswego, Jefferson, and Lewis counties. Approximately 1,950,000 people live within this focal area, concentrated primarily in the Buffalo and Rochester metropolitan areas, with other concentrations in smaller cities such as Lockport, Batavia, and Oswego. Land uses are divergent as two of the largest urban centers in New York are found in this focal area, but there are also extensive areas of forestland across the region and dairy and farmland in the Lake Plains, the most notable of the latter being the extensive fruit and specialty crops associated with the near-shore climate.

This focal area was selected because it contains significant aquatic, wetland, and lakeshore habitats as well as significant waterways. There are currently five Federally-listed species (endangered [E], threatened [T], candidate [C]) and nine identified species of concern within the focal area. Iroquois National Wildlife Refuge is located within the focal area, which includes one of seven state-listed Bird Conservation Areas within the focal area boundary. The focal area is important for migratory, stop-over, and breeding habitat for waterfowl, shorebirds, waterbirds, raptors, and passerines. The GLFA is within Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Region 15 (Lower Great Lakes Plain). Significant shoreline areas support populations of common tern as well as critical habitat for piping plover (E), although the latter currently does not breed in this focal area. Successional and grassland habitats contain populations of bobolink and woodcock. Although not as heavily forested as other parts of New York, forests in this focal area and their associated foraging areas provide habitat for Indiana bat (E), cerulean warbler, and broad winged hawk. The lakes and almost 28,000 miles of streams support remnant populations of the once widespread lake sturgeon and brook trout populations. Most notably, the GLFO's extensive wetland habitats

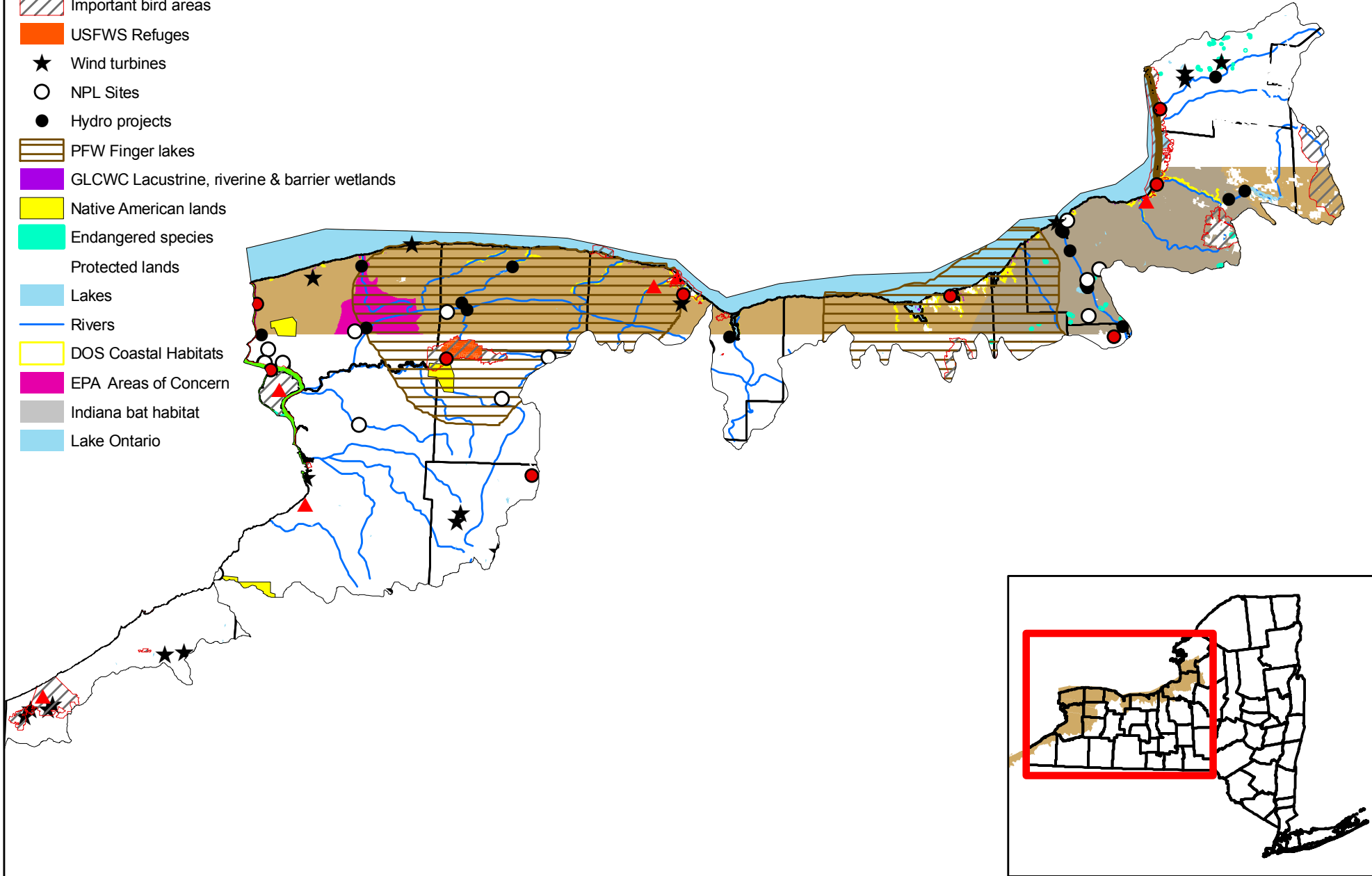
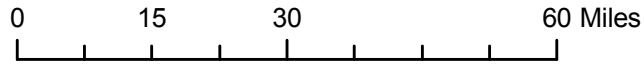
contain populations of bog turtle (T), massasauga rattlesnake (C), Houghton's goldenrod (T), black duck, and bald eagle.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, navigation, water level regulations, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss (principally), fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, changes in agricultural practices, shoreline hardening, degraded water quality, and climate change. Current projects include the Fish Enhancement, Mitigation, and Research Fund (FEMRF), Buffalo and Niagara Natural Resource Damage Assessment and Restoration (NRDAR) cases, Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

# Legend

- Bird conservation areas
- ▲ Hawkwatch sites
- Niagara River
- OntarioPloverHabitat
- ▨ Important bird areas
- USFWS Refuges
- ★ Wind turbines
- NPL Sites
- Hydro projects
- ▨ PFW Finger lakes
- GLCWC Lacustrine, riverine & barrier wetlands
- Native American lands
- Endangered species
- Protected lands
- Lakes
- Rivers
- DOS Coastal Habitats
- EPA Areas of Concern
- Indiana bat habitat
- Lake Ontario

## Great Lakes Focal Area



# American Woodcock (*Scolopax minor*): Great Lakes Focal Area

## American Woodcock Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

**Justification for species selection:** Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked “High” (H) on the BCR 13 list of “Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture”. It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a “Bird in Trouble” in the Eastern Forest in the North American Bird Conservation Initiative’s 2009 report, “The State of the Birds, United States of America.”

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

# American Woodcock (*Scolopax minor*): Great Lakes Focal Area

**State contribution to overall species population:** Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can be found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

## Threats and threat assessment:

- 1. Loss of habitat and habitat function.** The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).
- 2. Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

## Research needed:

- Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).
- 3. Contaminants.** Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009).
  - 4. Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.



# **American Woodcock (*Scolopax minor*): Great Lakes Focal Area**

## **Research needed:**

- Research is needed to determine the effects of climate change on this species.

## ***Population goal(s) for New York State:***

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

## **Management Objectives for the Population:**

- A. Halt population declines by 2012 as measured by Singing Ground Surveys
- B. Have positive population growth by 2022

Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

## **Overall Goal:**

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

## **Management Objectives for Habitat for This Species:**

- A. Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)
- B. To increase early successional habitat by 2022

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

# **American Woodcock (*Scolopax minor*): Great Lakes Focal Area**

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

## **1. Loss of habitat and habitat function.**

- a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.
  - i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.
  - ii. Work with land trusts to target woodcock conservation.
  - iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).
  - iv. Use geospatial tools to:
    - Analyze existing areas of habitat to determine potential breeding areas;
    - Analyze breeding bird survey data to focus efforts; and,
    - Create map for possible woodcock sites of concern.

## **2. Decline in food supply.**

- a. Strategy will depend upon results of research need noted above.

## **3. Contamination.**

- a. Strategy will depend upon results of research need noted above.

## **4. Climate change.**

- a. Strategy will depend upon results of research need noted above.

# American Woodcock (*Scolopax minor*): Great Lakes Focal Area

## *Partners/potential funding:*

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), and universities.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Loss of habitat and habitat function.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.
- b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.
- c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this species. In developing BMP, consider the management recommendation of the NAS 2009 (appended to the end of this document).
- d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat.
- e. Provide technical assistance to NRCS for the Wetlands Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock.
- f. [Conduct restoration planning and implementation for the Hi View Terrace NRD settlement. \(EC FY2011\)](#)
- g. Work with partners (RGS, NYSDEC, National Wildlife Refuges, [NWR], etc.) to enhance/create early successional habitat within the Focal Area.
  - i. [Complete 100 acres of early successional habitat projects \(PFW\) within the Great Lakes and Upper Susquehanna Focal Areas. Cost would depend on type of equipment used and who would complete work. A rough estimate would be \\$300-\\$500/ac. \(FY 2011-2013\).](#)
  - ii. [Coordinate logistics with NWR R5 Hydro-Ax \(on-going\) \(PFW\).](#)

### **2. Decline in food supply.**

## **American Woodcock (*Scolopax minor*): Great Lakes Focal Area**

- a. Delivery will depend upon strategy determined from research noted above.

### **3. Contamination.**

- a. Delivery will depend upon strategy determined from research noted above.

### **4. Climate change.**

- a. Delivery will depend upon strategy determined from research noted above.

#### *Partners/potential funding:*

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and the WMI. Other potential partners include: USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, New York Power Authority (NYPA), Thousand Islands Land Trust (TILT), universities.

## **OUTREACH**

### [Landowner education during site visits when potential habitat projects are present \(on-going\) \(PFW\).](#)

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

### [Put Landowners Guide to Woodcock Management up on NYFO web site \(FY2011\) \(IT\).](#)

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be

## **American Woodcock (*Scolopax minor*): Great Lakes Focal Area**

protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds.”

### *Potential Outreach Partners:*

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, and NGOs.

### **MONITORING**

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

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## **American Woodcock (*Scolopax minor*): Great Lakes Focal Area**

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NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005 ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

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Thogmartin, W.E., J.R. Sauer and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. *The Journal of Wildlife Management*. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007) [http://www.acjv.org/bcr13\\_plan.htm](http://www.acjv.org/bcr13_plan.htm)
- American Woodcock Conservation Plan (Kelley et al. 2008) [http://www.timberdoodle.org/sites/default/files/woodcockPlan\\_0.pdf](http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf)
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004) [http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm)
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)

Woodcock Management Recommendations (NAS 2009):

## **American Woodcock (*Scolopax minor*): Great Lakes Focal Area**

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).
- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.
- Encourage native trees and shrubs.
- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.
- Maintain young, dense forest of at least 5 acres for nesting and feeding.
- Maintain grassy areas near water sources for feeding and display grounds.

# **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

## **Bald Eagle Species Action Plan**

### **FOCAL AREA: GREAT LAKES**

#### *Other species benefitting:*

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** Although newly delisted from the Federal endangered species list, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. Although the Great Lakes shores are not known as important eagle roosting areas due to violent winter weather and icing over, there are increasingly more nests along the shore, including one in Irondequoit Bay and 5 more in Region 9 of the New York State Department of Environmental Conservation (NYSDEC). This region had the lowest nesting success rate at 64%, below the State average of 71%.

**Justification for species selection:** Once Federally delisted, the bald eagle and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still State listed and a new permit program for authorization of unavoidable take is slowly being utilized. The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the ridge just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines.

**State contribution to overall species population:** The NYSDEC conducts an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate



## **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

between resident eagles and seasonal migrants in the annual count in January. The bald eagle is still State listed as threatened.

### **Threats and threat assessment:**

1. Modification or destruction of habitat(s), including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).
2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.
3. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for “death by a thousand cuts” effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.
4. Other man-made or natural factors including collisions with trains – in 2009, 10 (known) bald eagles were killed along the rail line along the Hudson River.
5. Ingestion of environmental contaminants, impacts to reproduction.

### **Research needed:**

- Identification of essential breeding and wintering habitats to target locations for habitat management and protection.

(WHO: NYSDEC, U.S. Geological Survey [USGS], NYFO, Southern New England/New York Bight [SNENYB])

- Identification of movement patterns, migratory pathways, and the locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This needs to include the heights at which eagles fly when riding thermals (in the vicinity of potential wind energy development sites) for both activity associated with breeding and migratory movements.

(WHO: USGS, USFWS Migratory Bird Office, Virginia Tech, Hawk Watch groups, wind energy developers)

- Monitoring contaminant levels in eagles in New York.

(WHO: NYSDEC, NYFO, USGS)

## **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

- Continued pathology investigations to determine causes of mortality in bald eagles.

(WHO: NYSDEC, National Wildlife Health Center, NYFO)

- Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed.

(WHO: permittees of BGEPA permit program, NYSDEC, ESA permittees)

### *Partners/potential funding:*

NYSDEC, New York State Energy Research and Development Agency (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers

### *Population goal(s) for New York State:*

Goal – productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population.

(WHO: NYSDEC)

## **CONSERVATION DESIGN**

### **1. Loss of habitat.**

- a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.
- b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes.
- c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats.

### **2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

- a. Through hunter education programs, address nest protection programs.

# **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

- b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.
- c. Develop a strategy for addressing high levels of contaminants, if found.

### **3. Inadequacy of existing regulatory protections.**

- a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

### **4. Other man-made or natural factors.**

- a. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles.
- b. Address wind related mortalities by improved intraoffice coordination on development of BMP and other strategies.

### **5. Ingestion of environmental contaminants, impacts to reproduction.**

- a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.
- b. Seek to minimize loss of habitat due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
- c. Investigate development of an On-/Off-Refuge proposal to address impact of contaminants on osprey and/or other avian species and seek funding for such work. (EC FY2011)

#### *Partner organizations:*

Onondaga Audubon Society, Rice Creek Field Station, Cornell Lab of Ornithology, Ripley Hawk Watch, NYSDEC, Haudenosaunee Confederacy.

## **CONSERVATION DELIVERY**

### **1. Loss/degradation of habitat.**

- a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in

## **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

- i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc.
  - ii. Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes (Conservation Planning Assistance [CPA]).
  - iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting.
  - iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting, and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews.
  - v. Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat (CPA).
- b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats.
    - i. Obtain, prepare, and/or distribute maps outlining key conservation areas to coworkers who may be reviewing projects in bald eagle habitat.
    - ii. Assist coworkers in drafting language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats.
    - iii. Develop/tweak national guidelines for land management agencies to ensure that their trail systems minimize impacts to bald and golden eagles in concentration areas. Prepare guidelines and distribute to State Parks, State Forests, and National Forests interpretation staff.
- 2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**
    - a. Through hunter education programs, address nest protection programs.

## **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

- b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.
- c. Develop a strategy for addressing high levels of contaminants if found.

### **3. Inadequacy of existing regulatory protections.**

- a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

### **4. Other man-made or natural factors.**

- a. Address other factors.
  - i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles.
  - ii. Address wind-related mortalities by improved intraoffice coordination on development of BMP and other strategies.
  - iii. Meet with new Northern BGEPA coordinator to discuss an approach to compliance (CPA).
  - iv. Work with the NYSDEC, industry, other field offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors (CPA).

### **5. Ingestion of environmental contaminants, impacts to reproduction.**

- a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.
- b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - i. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat (CPA) (2010-2013).

### **6. Address disease or predation, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs.**

## **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

- a. Investigate whether bald and golden eagle fact sheets could be provided at hunter training programs run by the NYSDEC. Develop fact sheets and distribute.
7. **Address inadequacy of existing regulatory protections** by providing information about the Federal BGEPA as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.
  - a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes.
  - b. Identify three organizations with whom we could meet to further BGEPA education – builders, outfitters, etc.

### **OUTREACH**

**See specific examples, above**

[Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current \(CPA\).](#)

Develop an accompanying workbook based on the one the BOCES students started.

### **MONITORING**

Development of protocols to measure progress/success.

Monitoring to measure progress/success.

[Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles \(CPA\).](#)

[Investigate options for funding to assist the State with post-listing activities \(CPA\).](#)

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## **Bald Eagle (*Haliaeetus leucocephalus*): Great Lakes Focal Area**

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# American Black Duck (*Anas rubripes*): Great Lakes Focal Area

## American Black Duck Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, Greater and lesser scaup, long-tailed duck)

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

**Justification for species selection:** The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR 13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003).

The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

**State contribution to overall species population:** Range extends across New York in freshwater habitat.

#### **Research needed:**

- Develop GIS tools to determine how much habitat remains.

(Who: New York Field Office [NYFO], Ducks Unlimited (DU) to assist with wetland surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)



## American Black Duck (*Anas rubripes*): Great Lakes Focal Area

- Need to complete population modeling and habitat suitability indices to ascertain how much habitat is needed and where.

(Who: U.S. Fish and Wildlife Service [USFWS] (Ralph Tiner) and Buffalo District, U.S. Army Corps of Engineers [USACE]; Cost: unknown at this time).

- Design a regional management program, including increased coordination among managers and biologists, to prevent duplication of research efforts and to share current information (Fish and Wildlife Information Needs System [FWINS]).
- Regional monitoring program to provide better abundance and population trend information needed for secretive wetland birds.

(Who: Audubon, Cornell Lab of Ornithology, NYFO (GIS); Cost: use existing staff)

- Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during breeding.

(Who: State University of New York – College of Environmental Science and Forestry [SUNY-ESF], Audubon, Cornell Lab of Ornithology)

### Threats and threat assessment:

1. **Loss of habitat and habitat function:** Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

#### Research needed:

- Need to characterize habitat loss
  - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas
  - Develop GIS tools to determine how much high value habitat remains and how much is needed and where.
  - Characterize loss in habitat function (i.e. determine the cause).
  - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.
2. **Invasive species:** Invasive species, such as *Lythrum salicaria* or *Phragmites australis*, have impacts on wetland habitat, potentially adversely affecting black ducks.

# American Black Duck (*Anas rubripes*): Great Lakes Focal Area

## Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
  - Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
  - Evaluate effects of invasive plants.
  - Develop GIS tools to determine how much habitat remains free of invasives.
  - Need to characterize habitat loss due to invasives (i.e. what is causing it).
3. **Hybridization with mallards.** Hybridization between mallards (*Anas platyrhynchos*) and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

## Research needed:

- Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).
4. **Climate change.** Most existing climate change models predict less runoff and, therefore, lower water levels in the region.

## Research Needed:

- Assess changes in habitat community structure.
  - Determine climate change impacts on prey base during breeding season.
5. **Public use** (recreational disturbances).
6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Great Lakes Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks.

(Who: New York State Department of Environmental Conservation [NYSDEC], NYFO, U.S. Environmental Protection Agency [USEPA] through Great Lakes Restoration Initiative [GLRI]; Cost: NYFO staff time)

7. **Changes in prey base** during breeding season.

*Population goal(s) for New York State:*

# American Black Duck (*Anas rubripes*): Great Lakes Focal Area

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

## Research needed:

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for Great Lakes in New York.

## CONSERVATION DESIGN

### *Strategies for addressing those threats:*

#### 1. Loss of habitat.

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit black ducks.
- c. [Participate in Mitigation Bank Review Teams \(MBRT\) for Rochester Cornerstone and Raymond Road mitigation banking teams to review and authorize mitigation banks \(Conservation Planning Assistance \[CPA\]\).](#)
- d. Participate in the New York State Wetlands Forum to coordinate wetland restoration/protection activities that would benefit black ducks.
- e. Facilitate habitat preservation through coordination with land trusts.
- f. Preserve, restore and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.
- g. Use GIS or develop new tools to help identify and target especially the wetlands that have the highest potential to produce black ducks. Protect all remaining high quality habitat.

#### 2. Loss of habitat function (values diminished).

- a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
- b. Seek to minimize loss of habitat value by influencing International Joint Commission decisions on river water level management.

## **American Black Duck (*Anas rubripes*): Great Lakes Focal Area**

- c. Evaluate and prioritize USFWS Natural Resource Damage Assessments (NRDA) along the Great Lakes.
- d. Improve the quality of the prey base by addressing environmental contaminants in foraging areas.
- e. Seek to minimize loss of habitat value as a result of invasive species invasion.

### **3. Invasive Species**

- a. Target invasive species control projects on wetland sites that would benefit black ducks. Seek to minimize success of invasives colonization in habitat in the Great Lakes. Determine how agency water management schedules may impact colonization of invasive species.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Loss of habitat.**

- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands by:
  - i. Developing Fact Sheets and best management practices (BMP) to minimize impacts to black ducks.
  - ii. Posting these Fact Sheets/BMP on our website.
  - iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
  - iv. Developing a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.
- b. Deliver habitat restoration and enhancement projects by:
  - i. [Manage Buffalo/Niagara Rivers NRDAR \(Natural Resource Damage Assessment and Restoration\) case; continue settlement negotiations with the potentially responsible parties \(PRP\), including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea \(of the Buffalo/Niagara Rivers NRDAR case\); if/when possible, use](#)

## American Black Duck (*Anas rubripes*): Great Lakes Focal Area

NRDAR funds toward black duck habitat restoration (Environmental Contaminants [EC]).

- ii. Restore – 30 acres of emergent wetlands and associated uplands to benefit black ducks in the Great Lakes watershed (GLRI) (PFW).
  - iii. Restore – 30 acres of grassland habitat to benefit black ducks in the Great lakes watershed (GLRI) (PFW).
  - iv. Monitor wetland habitat at Joseph Davis State Park (Love Canal Settlement) (EC).
  - v. Facilitate habitat preservation of marsh habitat adjacent to tributary streams through coordination with the Thousand Island Land Trust and other non-governmental organizations (NGO).
  - vi. Working with partners and fellow trustee agencies, identify habitat that could be restored using NRDAR funds associated with the Buffalo/Niagara Rivers and St. Lawrence cases.
- c. Influence regulatory agency decisions regarding siting, construction and operation of wind turbines proposed for the Great Lakes watershed by:
- i. Developing Fact Sheets and BMP to minimize impacts to black ducks and other waterfowl.
  - ii. Posting these Fact Sheets/BMP on our website.
  - iii. Providing substantive comments on proposed wind farms, including the Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario Wind Farm proposals, to both Federal, State, and local agencies with regulatory influence over windpower project siting and operation (CPA).
  - iv. Coordinate with Region 3 relative to potential impacts from offshore wind projects (determine if offshore wind projects could have a negative impact to waterfowl (CPA).

### 2. Loss of habitat function (values diminished).

- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands by:
  - i. Developing Fact Sheets and BMP to minimize impacts to black ducks (CPA, PFW).

# American Black Duck (*Anas rubripes*): Great Lakes Focal Area

- ii. Posting these Fact Sheets/BMP on our website (IT).
- iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks (CPA).
- iv. Prepare expedited preassessment document to determine whether PCC Gowanda National Priority List (NPL) Site poses threats to Trust resources and opportunity exists for NRDAR assessment work (EC).

## 3. Invasive Species

- a. **Restore habitat impacted by invasive plant species or impacted by water level regulation.**
  - i. Design, fabricate, and place a water control structure/fish ladder to provide a more natural water regime in tributary x of Lake Ontario.
  - ii. See northern pike species action plan. Actions that are being implemented to benefit the northern pike in the St. Lawrence Valley would also benefit black ducks by opening up foraging areas within monotypic cattail stands. Use amphibious excavator to create openings in *Typha* monocultural stands through a stretch of river/marsh, according to overall habitat restoration plans for the area.

### *Partners/potential funding:*

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), TNC, DU, Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), Buffalo/Niagara Riverkeeper, Niagara Greenway Committee, universities.

## OUTREACH

- Landowner education
- Public involvement - Create Outdoor Classroom wetland projects in the Great Lakes watershed.

## MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.

# American Black Duck (*Anas rubripes*): Great Lakes Focal Area

- Develop BMP from results of monitoring to inform future black duck population restoration activities.

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## **American Black Duck (*Anas rubripes*): Great Lakes Focal Area**

Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St Lawrence Plain (Rosenberg 2000). ([http://www.blm.gov/wildlife/plan/pl\\_18\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_18_10.pdf)).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).
- Bird Conservation Plan for the Lower Great Lakes/  
St. Lawrence Plain Bird Conservation Region (USFWS 2007). ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).
- North American Waterfowl Management Plan: Strategic Guidance (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf>.
- North American Waterfowl Management Plan: Implementation Framework (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf>.
- North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998). <http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf>.
- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005). [http://www.acjv.org/wip/acjv\\_wip\\_main.pdf](http://www.acjv.org/wip/acjv_wip_main.pdf).
- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009). [http://www.acjv.org/documents/ACJV\\_StrategicPlan\\_2009update\\_final.pdf](http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf).



# Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

## Bobolink Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

northern harrier, rough-legged hawk, red-tailed hawk, American kestrel, loggerhead shrike, upland sandpiper, short-eared owl, Henslow's sparrow, grasshopper sparrow, vesper sparrow, horned lark, blue-winged teal

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Bobolinks are neotropical migrants, traveling to South America each autumn and making a round-trip of approximately 12,500 mi. Bobolink habitat consists of open grasslands and hay fields. During migration and in winter, they use freshwater marshes, grasslands, and rice and sorghum fields. This ground nester looks for open grasslands and hay fields during the summer and builds a nest consisting of dead grass with a central lining of fine grass or sedges. Habitat patch size generally assumed to be a minimum 10 acres and can be well-managed by late season mowing. The nest may have a canopy of dead grass hanging over top. Clutch size ranges from 1-7 eggs that hatch in 11-13 days. Food consists primarily of seeds and insects. The bobolink is one of the few songbirds that undergo two complete molts each year, completely changing its feathers on both the breeding and wintering grounds. The bobolink is polygynous (Martin and Gavin 1995).

The bobolink is protected under Migratory Bird Treaty Act and listed as a Species of Greatest Conservation Need (SGCN) in New York State.

**Justification for species selection:** The bobolink was chosen as a priority species because of its importance in this geographic area. The bobolink is a grassland bird species targeted by the New York Grassland Bird Conservation Plan. It has been identified as a New York State "Species of Greatest Conservation Need" in New York (March 2003).

The population estimate for this species for the U.S. and Canada is 11,000,000 with 2,159,750 in Bird Conservation Region (BCR) 13 (Atlantic Coast Joint Venture [ACJV] 2007).

**State contribution to overall species population:** The bobolink's population trend is stable overall since 1966, but has shown 2-3% declines since 1980. It breeds throughout New York with the exception of the Adirondacks.

#### **Threats and threat assessment:**

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species. (In New York, primary disturbance to nesting is hay-cropping; 100% of nests with eggs and young nestlings affected by mowing were abandoned or destroyed).

# Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

## Research needed:

- There is a need to develop methods and data for modeling distributions and abundance of grassland land cover across the landscape.
- Research is needed to assess impacts of management on productivity of grassland birds to amplify existing information on grassland bird abundances associated with management.
- Research is needed to determine potential benefits of native grass species as grassland habitat in contrast with demonstrated benefit of non-native cool season grasses.

## 2. Collision with wind energy projects.

### Research needed:

- Research is needed to assess and reduce/mitigate risks from collisions.

## 3. Predation.

### Research needed:

- In South America, on wintering grounds, shooting and trapping is a probable factor as where species is considered a pest of agricultural crops and where males are sold in local pet trade. Needs further study.

## 4. Climate change. Changes in habitat community structure or prey base may affect this species.

### Research needed:

- Research is needed to determine the effects of climate change on this species.

### *Partners/potential funding:*

Ducks Unlimited (DU), land trusts, and non-governmental organizations (NGO), refuges, U.S. Geological Survey (USGS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, universities.

### *Population goal(s) for New York State:*

680,000 pairs of bobolinks. Per Rosenberg 2000, objective is to provide 775,000 ha of suitable grassland habitat to support the entire habitat-species suite (e.g. 680,000 pairs of bobolinks), with 100,000 ha maintained in large enough patches to support 7,600 pairs of upland sandpipers, and 2,000 ha intensively managed to support 1,000 pairs of Henslow's sparrows in New York and Ontario.

## CONSERVATION DESIGN

# Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

## *Strategies for addressing those threats*

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species
  - a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.
  - b. [Prioritize permit review in grassland habitat \(Conservation Planning Assistance \[CPA\]\)](#).
  - c. Develop fact sheets with best management practices (BMP) to minimize impacts to bobolink and use these to influence landowners regarding habitat needs of this species, including providing guidance regarding haying and mowing practices. In developing BMP consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document).
  - d. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit bobolink through creation of new habitat. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection. In creating bobolink habitat, consider the management recommendation of the NAS 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts.
  - e. Other strategies may result from research needs noted above.
    - i. Use geospatial tools to focus efforts: [Audubon New York is involved in bobolink conservation and may have data layers we can use; check studies by Cornell – in vicinity of Madison Co. NRCS has shape files for priority areas for Conservation Reserve Program \(CRP\) and Wildlife Habitat Incentives Program \(WHIP\) \(Information Technology \[IT\]\)](#).
    - ii. [Analyze existing areas of habitat to determine potential breeding areas – unlike woodcock, species does not have its own strategic plan; analyze breeding bird survey data to focus efforts \(CPA, Partners for Fish and Wildlife \[PFW\], \[IT\]\)](#).
    - iii. [Create map for possible bobolink sites of concern \(IT\)](#).
2. **Wind energy projects.**
  - a. Strategy will depend on results of research need noted above.
3. **Predation.**
  - a. Strategy will depend upon results of research need noted above.
4. **Climate change.**
  - a. Strategy will depend upon results of research need noted above.

# Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

*Partners/potential funding:*

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012.

### 1. Habitat loss and fragmentation.

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to bobolink and/or their habitat.
- b. Post on New York Field Office (NYFO) web site fact sheets with BMP to minimize impacts to bobolink and/or their habitat.
- c. 2011-2013 restore 50 acres of early successional grassland habitat to benefit bobolink and other birds with similar habitat needs at project site patch size of  $\geq 10$  acres (PFW).

### 2. Collision with wind energy projects.

- a. Delivery will depend upon strategy determined from research noted above.

### 3. Predation.

- a. Delivery will depend upon strategy determined from research noted above.

### 4. Climate change.

- a. Delivery will depend upon strategy determined from research noted above.

*Partners/potential funding:*

DU, land trusts and NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

## OUTREACH

Potential outreach needs:

- PFW Landowner Handouts
- NYFO Outreach (traveling exhibits)
- Local Newspaper/TV
- DU *Flyways* articles

## Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

- Other Federal and State agency referrals/coordination
- Working with NGO (land trusts, TNC)

### *Partners/potential funding:*

DU, land trusts and NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

## MONITORING

Develop protocols to measure progress/success of all conservation delivery activities.

Work with partners to identify leads for accomplishing monitoring activities.

Develop best management practices (BMP) from results of monitoring to inform future bobolink population restoration activities.

### *References*

Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish and Wildlife Service, Sunderland, Massachusetts.

Martin, S.G. and T.A. Gavin. 1995. Bobolink (*Dolichonyx oryzivorus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/176>.

Morgan, M. and M. Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under contract #C005137. Audubon New York, Ithaca, New York. 8 May 2008.

National Audubon Society. 2009. Bobolink: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 4 March 2010. ([http://ny.audubon.org/PDFs/HRVC\\_Bobolink.pdf](http://ny.audubon.org/PDFs/HRVC_Bobolink.pdf)).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

Rosenberg, K.V. 2000. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence River Plain. Version 1.0. Draft. 10 August 2000. ([http://www.partnersinflight.org/bcps/plan/pl\\_18\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_18_10.pdf)).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

Existing strategies for bobolink restoration:

## **Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area**

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000) [http://www.blm.gov/wildlife/plan/pl\\_18\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_18_10.pdf).
- A Plan for Conserving Grassland Birds in New York,” Final Report to NYSDEC (Morgan & Burger 2008) <http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf>.
- Partners in Flight North American Landbird Conservation Plan [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

Bobolink Management Recommendations (NAS 2009):

- Create large habitat patches (greater than 20 acres) and minimize woody edges whenever possible. Suitable habitat includes grasslands of moderate height (8-12”) and density, with adequate litter.
- Protect nesting habitat from disturbance during the breeding season (early May to August 1) by postponing haying, burning, and moderate or heavy grazing.
- Perform management activities in early spring, several weeks prior to the arrival of adults on the breeding grounds, or in the late summer or fall after the breeding season.
- Use a rotating management schedule on several nearby grassland fragments to provide a variety of habitat conditions. Adjacent patches of similar habitat provide refuge for fledglings to escape from mowed areas and for late-nesting females.
- Create or maintain patches of relatively sparse, grass-dominated vegetation resembling old hayfields (more than 8 years since planted).
- Encourage scattered forbs, such as clover, for nest-site cover and also for seeds and host plants for various invertebrates, which are critical for feeding rapidly growing nestlings.
- Mow or burn patches every 2-3 years to prevent development of woody vegetation.
- Avoid disturbance of suitable habitat (e.g., mowing) during the breeding season, May 1 to August 1.

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Great Lakes Focal Area**

### **Bog Turtle Species Action Plan**

#### **FOCAL AREA: GREAT LAKES**

##### *Other species benefitting:*

spotted turtle, bog buckmoth, fen plant communities including Eastern Larch, black huckleberry, *Vaccinium corymbosum*, *Acer rubrum*, *Carex lasiocarpa*, *Sphagnum spp.*

#### **BIOLOGICAL PLANNING**

##### *Introduction to species*

**Species information:** Bog turtles often hibernate communally with other bog turtles and with spotted turtles. The bog turtle emerges from hibernation which is often spent in an abandoned muskrat lodge or other burrow, by mid-April, when both the air and water temperatures exceed 50°F. Sexual maturity may be reached between 8-11 years old. Mating occurs in the spring (primarily) or fall and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest (tussocks). The eggs hatch around mid-September and the adults enter hibernation in late October. Bog turtles live for 30 years or more in wetland (fen) communities and may use adjacent upland areas. Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

**Justification for species selection:** The bog turtle was Federally-listed as threatened in 1997 and listed as endangered by the State of New York. The bog turtle is a U.S. Fish and Wildlife Service (USFWS) Spotlight Species and Region 5 of the USFWS has a new bog turtle initiative.

**State contribution to overall species population:** There are 2 Recovery Units (RU) in New York – the Prairie Peninsula/Lake Plain (PPLP) RU (NY has all known extant sites) and the Hudson Housatonic RU.

##### **Threats and threat assessment:**

Threats<sup>9</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

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<sup>9</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Great Lakes Focal Area**

- A. Residential and commercial development continues to be a leading cause of habitat loss and degradation. Most direct effects to bog turtles and their habitat are now avoided. Indirect effects to wetlands remain.

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collection is an ongoing threat.

### **Factor C. Disease or predation:**

- A. New concerns about potential disease issues in New York and Massachusetts.
- B. Predation is a threat at certain sites.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Continues to pose a threat.

### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Beaver use of sites, weather events (flooding, drought)
- B. Invasive species.
- C. Climate change may or may not be a threat to the species. (consider Kevin Schumacher's research at State University of New York-College of Environmental Science and Forestry [SUNY-ESF])

### ***Recovery Goals***

***Range-wide Recovery Goals/Objectives:*** Protect and maintain the northern population of this species and its habitat, enabling the eventual delisting of the species.

***Conservation goal(s) for New York State:*** Long-range protection is secured for at least 10 populations in PPLPRU. We have 5 extant populations in New York.

### **Research/Actions needed:**

- A. Determine goal, with the Pennsylvania Field Office (PAFO), for NY/PA for PPLPRU (FY2011). (Endangered Species [ESA])
- B. Conduct surveys to re-evaluate the presence of bog turtles at historical sites in PPLPRU (Recovery Action 3.3.1) and conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4)



# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*) Prairie Peninsula/Lake Plain Recovery Unit: Great Lakes Focal Area**

1. SUNY-Oswego 2010 Great Lakes Restoration Initiative (GLRI) Phase 1 survey project.
    - a. Provide technical assistance for GLRI funding request for SUNY-Oswego proposal to address Action 3.4 and possibly Action 3.3.1 in Wayne and Cayuga Counties (FY2010) [completed].
    - b. Develop grant agreement (FY2010) [completed].
    - c. Manage grant agreement (FY2011-12) (ESA).
  2. Provide technical assistance to SUNY-Oswego to develop follow-up proposal for Phase 2 surveys for GLRI grant (FY2011, NYFO ESA).
- C. Monitor status of and threats to extant populations (Recovery Actions 3.5 and 6.1)
1. Monitoring of potential new disease is needed – work being done in Hudson Valley.
  2. Conduct bog turtle surveys at all extant sites.
    - a. Develop a schedule and assign monitors to adopt an extant site.
  3. Develop a site plan for restoration of the Westbury Site; implementation contingent on landowner approval (Who: USFWS, SUNY-Oswego) (Partners for Fish and Wildlife [PFW], ESA).

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan completed 2001 (Service 2001)
- 5-year review drafted 2008 (Service 2008)
- Spotlight Species Action Plan 2009 (Service 2009)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Participate in Rangewide Bog Turtle Initiative (NYFO ESA, PFW)
  1. Participate in conference calls [ongoing].

# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*)**

## **Prairie Peninsula/Lake Plain Recovery Unit: Great Lakes Focal Area**

2. Attend March 10, 2010, meeting [completed FY2010].
  3. Assist Alison Whitlock in planning and convening next workshop (FY2011). (ESA, PFW).
- B. In each recovery unit, identify and prioritize sites for appropriate conservation efforts (Recovery Action 2.1) \*\*All sites are priorities in PPLPRU at this time given the number of sites\*\*
1. Initiate PPLPRU recovery implementation team (FY2011) (ESA).
  2. Develop a PPLPRU recovery implementation plan by August 1, 2011 (ESA).
  3. Develop site-specific management plans for each extant site is needed.
- C. Conduct research/studies to understand and identify the degree to which land-use activities alter bog turtle habitat (Recovery Action 6.2).
1. Conduct research to help understand indirect effects such as hydrological changes from residential and commercial development.
    - a. Request U.S. Geological Survey (USGS) Science Support Partnership (SSP) funding through Fish and Wildlife Information Needs and Studies (FWINS) posting (ES).
- D. Provide assistance to Regional Coordinator for development of 5-year review (ESA).

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Protect bog turtle sites through purchase and conservation easements (Recovery Action 2.3).
  1. Provide technical assistance to partners that may be able to protect sites (Recovery Land Acquisition grant, New York State Department of Environmental Conservation [NYSDEC] Environmental Protection Fund (EPF), The Nature Conservancy [TNC], or land trusts).
  2. Target Section 404 mitigation projects

## **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*) Prairie Peninsula/Lake Plain Recovery Unit: Great Lakes Focal Area**

B. Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting activities in wetlands (Recovery Action 1.2) and avoid and minimize direct and indirect adverse effects to bog turtles and their habitat (Recovery Action 1.3)

1. Develop standardized avoidance, minimization, and compensation measures (AMM).
  - a. Utilize materials on pipelines (AMMs, best management practices [BMP] from NiSource Habitat Conservation Plan [HCP] to develop pipeline fact sheet (FY2011) (ESA).
  - b. Post BMP on website (FY 2011) (IT).
2. Identify opportunities to add features promoting bog turtle conservation for Clean Water Act (CWA) section 404 compensatory mitigation permit requirements for development projects in counties with bog turtle populations, and
3. Once identified, provide substantive comments on measures to avoid and minimize direct and indirect effects, including those effects associated with development that originate in uplands.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** No work in PPLPRU planned in next 2-3 years.

**Factor C. Disease or predation:** Funding health assessment with Wildlife Conservation Society (WCS) - no samples planned from PPLPRU at this time.

**Factor D. The inadequacy of existing regulatory mechanisms:** No work planned in next 2-3 years.

**Factor E. Other natural or manmade factors affecting its continued existence:**

A. Manage, restore, and maintain bog turtle habitat, as appropriate (Recovery Action 6.4) and control succession and invasive exotic plants (Recovery Action 6.3.1).

1. Consult with SUNY-Oswego (Dr. Rosenbaum) and NYSDEC to identify priority sites for invasive plant control (FY2011) (ESA).
2. Westbury bog.
  - a. Conduct site visit - October 2009 (completed).
  - b. Identify necessary restoration activities - October 2009 (completed)

## **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*) Prairie Peninsula/Lake Plain Recovery Unit: Great Lakes Focal Area**

- c. Develop site plan for Westbury bog and implement contingent on landowner approval (FY2011) (ESA, PFW).
- d. Develop GLRI project proposal if NYSDEC is interested (PFW).

### **OUTREACH**

Current ideas include:

- Update website with BMP.
- Target nature centers located in the Recovery Unit and research the need for educational opportunities.
- Design outreach exhibit to inform the public on bog turtle life history, threats (including Climate Change), avoidance, minimization, and conservation measures.

### **MONITORING**

Review and track recovery progress.

#### *Partners*

NYSDEC, New York Natural Heritage Program (NYNHP), Natural Resources Conservation Service (NRCS), Finger Lakes Land Trust, The Nature Conservancy (TNC), New York State Department of Transportation (NYSDOT), U.S. Army Corps of Engineers (USACE)

#### *References*

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2008. Draft Bog Turtle Northern Population 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, State College, Pennsylvania

U.S. Fish and Wildlife Service. 2009. Draft Spotlight Species Action Plan.

# Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

## Broad-winged Hawk Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

bald eagle, red-shouldered hawk, red-tailed hawk, turkey vulture, Cooper's hawk, sharp-shinned hawk (buteos and accipiters in general), long-eared owl

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The broad-winged hawk is a small, stocky buteo. It is one of the few North American raptors that flock during migration. It is a common breeder in large deciduous or mixed-deciduous forests throughout northeastern and north central North America (Goodrich et al. 1996). During breeding, the broad-winged hawk is secretive or rather, unobtrusive. It lives mainly in the woods, beneath the canopy or hidden among the foliage. Often one is made aware of it only through its call. Its food consists mainly of snakes, mice, frogs, and insects. Most breeding occurs in Canada, and requires large tracts of forest. Most broad-winged hawks breeding in the eastern United States and southeastern Canada migrate to wintering grounds in southern Central America and central South America (Hawk Mountain 2004). During the migration, the broad-winged hawk is seen in large congregations, and when wind conditions are ripe, form "kettles" of soaring raptors. Birds that congregate in large numbers like this species are vulnerable to catastrophic harm (e.g. if a wind power project were poorly sited in a migratory pathway, collision with a large number of birds possible).

**Justification for species selection:** Broad-winged hawk populations have been decreasing since the 1980s and the species is representative of other migratory raptors. Most raptors are not adequately covered by current monitoring methods, so basic distributions, population estimates, and trend data are lacking for many raptors during the appropriate seasons – breeding, migration, staging, or wintering. Targeted monitoring programs should be established to understand the status of those species that require them, especially if there is evidence that the species has suffered or is suffering either long-term or dramatic population declines. Hawk Mountain broad winged hawk status report, 2007. [http://hawkmountain.org/media/broadwingCSR\\_June07.pdf](http://hawkmountain.org/media/broadwingCSR_June07.pdf). Prominent spring migration locations occur along the southern shores of Lake Erie and Lake Ontario in New York, which is an area of high potential wind energy development. In addition, New York contains very important wintering habitat. The Bird Conservation Region (BCR) 13 (Lower Great Lakes/St. Lawrence) population is estimated at 3,000 individuals (in New York).

**State contribution to overall species population:** Range extends across New York. State estimated population of 32,000 individuals.

#### **Threats and threat assessment:**

1. **Loss of habitat due to urbanization and development** (especially along the lakeshore).

## **Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area**

2. **Fragmentation of habitat** (wind power projects, pipelines, transmission lines along migration, corridors and stop over habitat).
3. **Collision or habitat loss** from wind energy projects.
4. **Energy development** (nuclear).
5. **Predation.**
6. **Changes in habitat community structure** and changes in prey base during breeding and migration seasons, including declines in amphibian populations (National Audubon Society [NAS] 2009).
7. **Changes in species distribution and population sizes** due to climate change.

### **Research needed:**

- Research is needed to determine climate change impacts on habitat community structure and changes in prey base during breeding and migration seasons.
- Research is also needed to determine changes in species distribution and population sizes due to climate change.

(WHO: U.S. Fish and Wildlife Service [USFWS] Landscape Conservation Cooperative [LCC] proposal for landscape scale evaluation of this species which is representative of many migratory raptors)

### *Partners/potential funding:*

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, State University of New York-College of Environmental Science and Forestry (SUNY-ESF), Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

### *Population goal(s) for New York State:*

Maintain/increase basin populations

- Maintain stable regional populations
- Increase breeding pairs

### **Research needed:**

- Establish targeted monitoring of population status of forest breeding raptors to establish population goals.

# Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

- Conduct studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites, migration areas, preferred foraging areas, and interactions with competitors.

(WHO: USFWS proposal to LCC for landscape scale evaluation)

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

- 1. Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat
  - a. [Prioritize permit review in breeding areas of this species \(forests and lakeshore\) and influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species \(Conservation Planning Assistance \[CPA\]\).](#)
  - b. Participate in and support yearly migration monitoring and surveys.
  - c. Prioritize enhancement and restoration projects (forest & lakeshore) that would benefit this species (Partners for Fish and Wildlife [PFW]).
  - d. Initiate discussions regarding a thorough inventory of potential nest sites and preferred migration and foraging area habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome.
  - e. Work with partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors.
  - f. Use telemetry to monitor distributions and identify essential habitats.
  - g. Analyze existing areas of habitat and recently altered forest landscapes to determine potential breeding areas for this species.
  - h. Obtain breeding bird survey data for this species to focus efforts.
  - i. Create map or shapefile for possible broad-winged hawk sites for all New York Field Office (NYFO) programs.
- 2. Collision or habitat loss** from wind energy projects.
  - a. [Review wind energy projects to minimize impacts to this species \(by directing turbine placement away from large tracts of intact forest away from the lakeshore areas \(CPA\)\).](#)
- 3. Energy development (nuclear).**

## Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

- a. Review energy development projects proposed in near lakeshore areas, and in large intact blocks of forest habitat (CPA).

### 4. Predation.

Additional studies are needed to assess the degree to which predation impacts the species.

### 5. Changes in habitat community structure and changes in prey base.

- a. Seek to influence regulatory agency decisions by providing input into conservation measures that would minimize impacts of development in forested areas near the lakeshore (CPA).

### 6. Climate change.

- a. Strategy will depend on results of research need noted above. Seek to influence regulatory agency decisions by providing comments on projects that may result in long-term impacts on habitat structure (CPA).

#### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 – 2012

### 1. Loss of sufficient quantity/quality of habitat and/or fragmentation of habitat.

- a. Provide substantive Federal agency comments on proposed Federal agency actions (including land development) with likely adverse impacts to this species and/or its habitat (CPA).
- b. Participate in and support yearly migration monitoring and surveys.
  - i. Participate in Hawk Watch sites/banding stations (Derby Hill [CPA] [T. Sullivan]).
  - ii. Support Hawk Watch sites/banding stations (CPA).
- c. Develop information related to minimizing the impacts of development, land management, and silviculture on forest raptors, and post on NYFO web site.
  - i. Develop Fact Sheets with best management practices (BMP) to minimize impacts to broad-winged hawks from silvicultural activities, and use these to influence



# **Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area**

landowners regarding habitat needs of this species and to encourage landowner protection of forests.

- 2. Collision or habitat loss** from wind energy projects.
  - a. Provide substantive Federal agency comments on proposed Federal actions regarding wind energy projects to minimize impacts to this species (CPA).
    - i. Coordinate with other offices involved in wind power project siting to assess potential for additive effects to the species in other parts of the species range, including the length of their migratory routes (through Pennsylvania for example) (CPA).
- 3. Energy development** (nuclear).
  - a. Review energy development projects proposed in near lakeshore areas and in large intact blocks of forest habitat (CPA).
    - i. If expansion of the facilities at Nine Mile Point, Oswego County, goes forward, work with other agencies and the developer to provide for continued availability of broad-winged hawk breeding, foraging, and resting areas along the south shore of Lake Ontario. Provide recommendations for forest patch size that needs to be maintained and habitat connections to wetlands for foraging (CPA).
- 4. Predation.**

No work is planned to address this threat; more information will be available once further studies are conducted.
- 5. Changes in habitat community structure** and changes in prey base.
  - a. Seek to influence regulatory agency decisions.
    - i. Seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured. Seek to minimize use of pesticides in new developments to ensure viable populations of amphibian prey; minimize use of pesticides to control mosquitoes. Sprays will also impact larger insects which are an important prey item for broad-winged hawks (CPA and Environmental Contaminants [EC]).
- 6. Climate change.**
  - a. Delivery will depend upon strategy determined from research above.

## *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper,

# **Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area**

Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

## **OUTREACH**

### **Potential outreach needs:**

- Landowner education
- Public involvement
- Promote wind power traveling exhibit
- Create Fact Sheet
- Meet with non-governmental organizations (NGO) such as Hawk Watch groups, Audubon chapters, etc., to deliver conservation message

### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

## **MONITORING**

- Develop protocols to measure success of all conservation delivery activities.
- Work with partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future broad-winged hawk population restoration activities.

### *References*

Dettmers, R. and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.partnersinflight.org/bcps/plan/pl\\_15\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf)).

Goodrich, L.J., S.C. Crocoll, and S.E. Senner. 1996. Broad-winged Hawk (*Buteo platypterus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/218>.

Hawk Mountain. 2004. Broad-winged hawk. <http://hawkmountain.org/media/BWHA.pdf>.

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National Audubon Society. 2009. Broad-winged hawk: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 8 March 2010. ([http://ny.audubon.org/PDFs/HRVC\\_BROADWINGEDHAWK.pdf](http://ny.audubon.org/PDFs/HRVC_BROADWINGEDHAWK.pdf)).

## **Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area**

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

Robertson, B. and K.V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003 ([http://www.partnersinflight.org/bcps/plan/pl\\_24\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf)).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

Existing strategies for broad-winged hawk restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003) [http://www.partnersinflight.org/bcps/plan/pl\\_15\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/ St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
- Broad-winged Hawk Conservation Status Report (Hawk Mountain 2007) [http://hawkmountain.org/media/broadwingCSR\\_June07.pdf](http://hawkmountain.org/media/broadwingCSR_June07.pdf).

# Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

## Brook Trout Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

American eel, American shad, longtail salamander, wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow pH range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in pH caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds as highest priority for protection of brook trout populations.

**Justification for species selection:** The brook trout is a highly prized native sport fish, but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations (NGO), and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

## Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

**State contribution to overall species population:** Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Great Lakes watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

### Research needed:

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC and Trout Unlimited (TU) to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### Threats and threat assessment:

1. **Loss of habitat and habitat function;** habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

### Research needed:

- Extensive and frequent stream surveys to determine population size.

(Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

- Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

(Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

- Need to locate heritage streams and heritage populations.

(Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

## Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

### Research needed:

- Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

(Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

- Identify which known barriers are having an influence on brook trout distribution.

(Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

### 3. Competition from non-native salmonids.

#### Research needed:

- Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

(Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### 4. Climate change; increased water temperatures.

#### Research needed:

- Identification of climate change related impacts to brook trout.

(Who: National Weather Service, LCC, academics; Cost: unknown at this time)

#### *Partners/potential funding:*

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC).

#### *Population goal(s) for New York State:*

The EBTJV has numerous conservation goals, including “Conserve, enhance or restore brook trout populations”, and “...to perpetuate and restore brook trout populations throughout their historic range”; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Great Lakes watershed. Establishing population goals remains a research need.

# Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.
- c. Facilitate habitat preservation through coordination with land trusts.
- d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.
- e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified.
- f. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

#### **2. Barriers to migration (including dams and impassable culverts).**

- a. Working with partners, identify and remove barriers.
- b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.
- c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

#### **3. Competition from non-native salmonids.**

## Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

### 4. Climate change; increased water temperatures.

- a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
- b. Design and construct habitat enhancement projects which provide increased flow, stream shading, pool cover, and increased availability of riffle habitat

*Partner organizations:*

NYSDEC, NYSOPRHP, TU, Allegheny County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### 1. Loss of habitat.

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
  - i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.
  - ii. Post these fact sheets/BMP on our website.
  - iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA], Environmental Contaminants-Biological Technical Assistance Group to U.S. Environmental Protection Agency [USEPA] FY 2011-2013) (CPA and Environmental Contaminants [EC]).
  - iv. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.
  - v. Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review. (CPA).



## Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

- vi. Develop stream buffer guidelines/BMPs and post on website.
  - b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).
    - i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).
    - ii. Restoration work via natural stream design on about 0.5 miles of Salmon River and tributaries in FY2011 (total is about 1.5 miles). (PFW with funding from base funds, Great Lakes Restoration Initiative [GLRI] money through LGLFWCO and NYSDOT) (2011).
    - iii. Restoration work via natural stream design on 2, 200 feet of Clear Creek. (PFW with funding from base funds, GLRI money through LGLFWCO, NYSDEC, NYSDOT) (2011).
    - iv. Restoration work via natural stream design on 0.5 miles of Sandy Creek (PFW with funding from base funds, GLRI money through LGLFWCO and NYSDOS, NYSDOT, Jefferson County SWCD, Tug Hill Commission) (2011).
    - v. Restoration work via natural stream design on 0.5 miles of Chittenango Creek (PFW with funding from base funds and NYSDOT) (2011).
  - c. Facilitate habitat preservation through coordination with land trusts or NGOs.
    - i. Work with TU to identify parcels for protection.
  - d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).
  - e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.
    - i. Statewide – Conduct a training session for County SWCD staff on natural stream design – March 2011 (PFW).
- 2. Barriers to migration** (including dams and impassable culverts).
- a. Working with partners, identify and remove barriers.

## Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

- i. Work with LGLFWCO to identify additional projects in 2011 – 2013 (PFW) (GLRI).
- b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.
  - i. No work indentified at this time.
- c. Work with NYSDOT Region 3, 4, and 5 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage. (2011 – 2013) (PFW). (1 project confirmed for FY2011; potential for 1 additional project in FY2011)
  - i. Design and install culvert baffle systems with NYSDOT Region 3, 4, and 5, bury perched culverts as opportunities present themselves within this NYSDOT region (PFW) (2011 – 2113).

### 3. Competition from non-native salmonids.

- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.
  - i. No work indentified at this time.

### 4. Climate change; increased water temperatures.

- a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
  - i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.
- b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

### 5. Marcellus Shale Natural Gas Extraction.

- a. Identify sub-watersheds likely to be impacted by hydro fracturing gas extraction techniques.

## OUTREACH

In addition to the web site, there is an EBTJV Google Group (<http://groups.google.com/group/ebtjv>).

## Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of “ongoing activities” on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project Trout in the Classroom.

### MONITORING

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.
- Establish benchmarks for success based on EBTJV.
- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.
- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.
- Seek funding and support for monitoring.

### *Partners*

TU, NYSDEC, LGLFWCO

### *References*

Eastern Brook Trout Joint Venture main website (<http://www.westernbrooktrout.org>).

Eastern Brook Trout Joint Venture data and maps (<http://sain.utk.edu/ebtjv/index.php>).

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (<http://sain.utk.edu/ebtjv/download/priorityscores.php>).

Trout Unlimited Brook Trout Conservation Strategy (<http://www.tu.org/conservation/eastern-conservation/brook-trout>).

## **Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area**

New York State Brook Trout Conservation Strategies  
([http://www.easternbrooktrout.org/docs/EBTJV\\_NewYork\\_CS.pdf](http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf))  
([http://www.easternbrooktrout.org/docs/brookie\\_NY.pdf](http://www.easternbrooktrout.org/docs/brookie_NY.pdf)).

# Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

## Cerulean Warbler Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

American redstart, red-headed woodpecker, American black duck, bald eagle, Baltimore oriole, black-billed cuckoo, Cooper's hawk, eastern wood-pewee, red-shouldered hawk, wood duck, wood thrush, Indiana bat

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The cerulean warbler lives high in mature and older deciduous forests with broken canopies in bottomland forests as well as forests on dry slopes and ridges. Common tree species used include oak, sycamore, cottonwood, maple, black locust, and elm. It prefers large tracts of at least 50 – 75 acres, but is more productive in tracts greater than 600 acres. This species is insectivorous and eats caterpillars, beetles, wasps, and bees.

The Partners in Flight (PIF) Lower Great Lakes Plain Conservation Plan (Physiographic Area 15) (Dettmers and Rosenberg 2003) identifies this species as one of 7 priority species in the area. Comparisons between the 1980–1985 and 2000–2005 breeding bird surveys for New York indicate that the western Lake Ontario plain is an important breeding area in New York for cerulean warblers, with the incidence of confirmed breeding stable to declining. Range-wide, cerulean warblers have experienced a long-term population decline. Analysis of North American Breeding Bird Survey (BBS) data indicates that over the last 40 years, the decline has been steep and steady at a rate of about -3.0% per year. Remaining forest tracts in this area are extremely valuable to cerulean warblers, which also have expanded into the region in recent decades. Many of these forests are associated with wetland systems along the Erie Canal system or Great lakes shorelines.

**Justification for species selection:** The cerulean warbler was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is a New York State Species of Greatest Conservation Need; a Special Concern Species in New York; classified as High-High on the Bird Conservation Region (BCR) 13 Priority List (USFWS 2007); and, a Species of National Conservation Concern, listed as “yellow” on the Audubon watch list. According to the PIF North American Landbird Conservation Plan, 97% of the breeding population is within the eastern avifaunal biome, and the cerulean warbler is among the most specialized and threatened birds of the deciduous forest and is in need of focused conservation attention throughout its range.

**State contribution to overall species population:** In New York State the cerulean warbler is mostly rare, but remains common in areas where suitable habitat still exists (NYSDEC 2010).

## **Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area**

Some principal breeding areas for the cerulean warbler remain in New York within the lowland plain south of Lake Ontario (NYSDEC 2010). Cerulean warblers are found in areas including the Montezuma Wetlands Complex, Alleghany State Park and National Forest, and the Hudson River Valley and Highlands of southeastern New York (Rosenberg et al. 2000).

### **Research needed:**

- Survey suitable habitat to determine most important breeding sites and potential breeding sites.
- Determine the use of forest patches by transient cerulean warblers in the spring and fall, include urban greenbelts.

### **Threats and threat assessment:**

#### **1. Forest fragmentation.**

##### **Research needed:**

- Further study is needed to determine the degree of fragmentation tolerated by cerulean warbler populations and to define the minimum forest tract size needed to support breeding populations of this species (NYSDEC 2010).

#### **2. Loss of habitat;** at breeding and wintering grounds, as well as migratory stopover habitat.

##### **Research needed:**

- Research is needed to identify specific target areas within the focal area for habitat conservation efforts in support of population goals.
- Research is needed on the life history of the cerulean warbler. The biology's of both male and female cerulean warblers: their conservation needs and any differences between them; factors affecting post-fledging survival; dispersal patterns and their extent as well as patterns of migratory connectivity.
- Research is needed on invasive species such as wood burrowing insects that have the potential of altering a forest ecosystem.
- Research is needed on the shift in forest dynamics within prime breeding habitats due to the increased levels of wind generated by wind turbines.

#### **3. Collision with structures.**

##### **Research needed:**

## **Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area**

- Research is needed to assess and reduce/mitigate risks from collisions (including off-shore oil platforms, wind farms, communication towers, etc.) Currently, little is known about the specifics on migratory behavior. More research is needed in this area to help reduce the risk of collisions with structures.

### **4. Environmental contaminants.**

#### **Research needed:**

- There are no known contaminant issues in this focal area at this time.

### **5. Climate change – changes in habitat community structure or prey base.**

#### **Research needed:**

- Investigate correlations between climate change and forest availability as a potential tool for predicting future changes in cerulean warbler distribution and management needs.
- Investigate correlations between climate change and timing of spring arrival.
- Investigate a change in frequency of catastrophic weather events, particularly hurricanes during the fall migratory period.

#### *Partners/potential funding:*

Haudenosaunee Confederacy, Refuges, U.S. Geological Survey (USGS), U.S. Forest Service (USFS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

#### *Population goal(s) for New York State:*

#### **Objectives:**

- Range-wide, protect or manage at least 1,500 continuous hectares of habitat to support 1,200-1,500 pairs of cerulean warblers in PIF Lower Great Lakes Plain (Physiographic Area 15).
- Achieve less imperiled status on BCR Priority Bird Species list or New York State Species of Greatest Conservation Need List.
- Double cerulean warbler population in next 50 years (Cerulean Warbler Conservation Action Plan [USFWS 2007]).

## **Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area**

- Increase continental population by 100% (PIF goal).

### **Research needed:**

- Current goals are broad, therefore, research is needed to refine population goals for cerulean warblers, and reduce critical knowledge gaps regarding demographics, population size and trends, and life history.

## **CONSERVATION DESIGN**

### ***Strategies for addressing the threats***

#### **1. Forest fragmentation.**

- a. Develop and implement forest management plans for cerulean warbler. Support comprehensive forest planning on all public lands, incorporating needs and objectives to reverse declines of cerulean warbler.
- b. Reduce forest fragmentation and loss on breeding grounds by protecting large contiguous forest tracts via influencing regulatory agency decisions.
- c. Identify and manage for high quality post fledging habitat.
- d. Protect habitat –mature forest with multi-level, diverse.
- e. Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess affects this will have on breeding habitat for the warbler.

#### **2. Loss of habitat (breeding, wintering, migratory stopover).**

- a. [Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species \(CPA\).](#)
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration/enhancement projects to benefit this species, (ex. areas within and surrounding Iroquois National Wildlife Refuge [NWR], Oak Orchard Wildlife Management Area [WMA], Tonawanda Indian Reservation, and Galen WMA).
- c. Leverage money and partners to protect and improve winter habitat (Refuges, communities, Audubon, Natural Resource Damage Assessment and Restoration [NRDAR] funds).
- d. [Evaluate international options for NRDAR projects when opportunity arises \(Environmental Contaminants \[EC\]\).](#)

#### **3. Collision with structures.**



## **Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area**

- a. Evaluate impact of wind turbines at specific sites (Hamlin, Hammond, Lake Erie, and Lake Ontario, etc.); assist with monitoring (CPA).
- b. Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act (SEQRA) process (CPA).

### **4. Environmental contaminants.**

- a. Include cerulean warblers in contaminants analysis for NRDAR and other projects (EC).

### **5. Climate change.**

- a. Strategy will depend upon results of research needs noted above.

### *Partner organizations*

Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 - 2012

### **1. Forest fragmentation.**

- a. Develop Fact Sheets with best management practices (BMP) for Marcellus Shale drilling to reduce fragmentation (CPA 2012).
- b. Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation (CPA 2012).

### **2. Loss of habitat (breeding, migratory, winter stopover).**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat.
- b. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to cerulean warblers and/or their habitat.
- c. Use the complete inventory of most important breeding sites and potential breeding sites to protect, restore, or enhance breeding and migration stopover habitat.

## **Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area**

- d. Conservation delivery should focus on important areas for breeding cerulean warblers in New York as follows (from Rosenberg et al. 2000): Montezuma Wetlands Complex, Allegheny River-Salamanca region, Galen WMA, Iroquois NWR, Salmon Creek near Cayuga Lake, Allegany State Park and vicinity, Tonawanda Indian Reservation, Bear Mountain State Park, Castleton Island State Park, Letchworth State Park, West Point Military Reservation, Murray-Hulberton Area, and Chittenango Creek.
- e. Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.

### **3. Collision with structures.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. Projects identified to date include: Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario.
  - i. Evaluate impact of wind turbines at specific sites (Hamlin, Hammond, Lake Erie, and Lake Ontario); assist with monitoring (CPA).
- b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. (CPA).
  - i. Develop the CPA website with links to all national guidance and guidelines (CPA 2012).
  - ii. Explore development of additional guidance based on species found in New York State, geographic patterns of migratory bat and bird use. (CPA)

### **4. Environmental contaminants.**

- a. Delivery will depend upon results of cerulean warbler contaminant analyses (which will provide an indication of potential effects).

### **5. Climate change.**

- a. Delivery will depend upon strategy determined from research noted above.

#### *Partners/potential funding:*

- Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

# Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

## OUTREACH

- Develop the CPA website with links to all national guidance and guidelines.
- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.
- Develop Fact Sheets with BMP for Marcellus Shale drilling to reduce fragmentation.
- Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline and utility companies to reduce forest fragmentation.

## MONITORING

- As actions are undertaken, monitoring will need to be identified up front in order to implement it as part of the overall action.
- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future cerulean warbler population restoration activities.

## References

Cerulean Warbler Risk Assessment & Conservation Planning Workshop, Shepherdstown, WV, June, 2006.

Dettmers, R., and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.blm.gov/wildlife/plan/pl\\_15\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_15_10.pdf)).

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## **Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area**

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NYSDEC. 2010. Cerulean warbler fact sheet. (<http://www.dec.ny.gov/animals/59560.html>).

Rosenberg, Kenneth V., Sara E. Barker, and Ronald W. Rohrbaugh. 2000. An Atlas of Cerulean Warbler Populations. Final Report to USFWS: 1997–2000 Breeding Seasons. Cornell Lab of Ornithology, Ithaca, NY. December, 2000.

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

USFWS. 2007. A Conservation Action Plan for the Cerulean Warbler (*Dendroica cerulea*) produced for the USFWS, Division of Migratory Bird Management Focal Species Program. Revised version – 30 June 2007.

Existing strategies for cerulean warbler restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003).  
[http://www.partnersinflight.org/bcps/pl\\_15sum.htm](http://www.partnersinflight.org/bcps/pl_15sum.htm).
- Partners in Flight North American Landbird Conservation Plan  
[http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/).
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
- Conservation Action Plan for Cerulean Warbler (USFWS 2007)  
<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/CeruleanWarbler.pdf>.

# Common Tern (*Sterna hirundo*): Great Lakes Focal Area

## Common Tern Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

Bonaparte's gull, little gull, canvasback, common goldeneye, greater scaup, lesser scaup, long-tailed duck

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The common tern is a colonial breeder, breeding in wetland-open water habitats throughout the Great Lakes and along the northern Atlantic Coast. The common tern is an opportunistic forager taking small (3-15 cm) forage fish, crustaceans, and insects within 50 cm of the water's surface. They nest on islands, marshes, and lake and ocean beaches. Common terns prefer nest sites with sand, gravel, shell, or cobble substrates with scattered vegetation, or other protected areas where chicks can shelter. The North American common tern population is migratory, wintering mainly in South America or western Central America.

A recent review (Morris *et al.* 2010) of Great Lakes common tern survey data from 1976-2000, indicates long-term declines in nest numbers and colony sites. Band recovery data indicate that the Great Lakes common tern population is endemic with little immigration from the east coast population or elsewhere (Haymes and Blokpoel 1978; Blokpoel and Courtney 1982, as cited within Morris *et al.* 2010). The authors (Morris *et al.* 2010) suggest that specific policy development and management action is urgently needed to stabilize numbers of common terns on the Great Lakes.

**Justification for species selection:** The common tern is a New York State Threatened Species and a New York State Species of Greatest Conservation Need. In the Great Lakes focal area, common tern is also rated as High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region [(BCR) 13, Atlantic Coast Joint Venture (ACJV) 2007]. The overall trend in Great Lakes common tern nest numbers between 1976 and 2000 was negative (-19.1%) and represents a net decrease of 2,140 nests and 18 active nesting sites (Morris *et al.* 2010).

**State contribution to overall species population:** ACJV (2007) notes an estimated common tern population for BCR 13 of greater than 6,484 pairs. The Thousand Islands area of the St. Lawrence River contains at least 28 colonies (~totaling 700 pairs) of common terns (NYSDEC 2005). An additional 400 pairs are located on Lake Oneida islands in New York (NYSDEC 2005). Common terns also breed along the northern and western shores of Lake Erie (including Buffalo Harbor), the U.S. waters of the Niagara River, and Lake Ontario (Morris *et al.* 2010).

**Research needed:** Increase knowledge/understanding of common tern in New York.

## Common Tern (*Sterna hirundo*): Great Lakes Focal Area

- Great Lakes Colonial Waterbird Surveys conducted every 10 years - determine New York status: survey should be occurring soon (2011-2014).

(Who: NYFO (CPA); Cost: NYFO staff time)

- Recommended monitoring: survey of known nest colonies every 5 years – determine New York status: survey should be occurring soon (2012-2013?).

(Who: Audubon, New York State Department of Environmental Conservation [NYSDEC], NYFO; Cost: NYFO staff time)

- Data on waterbird abundance, distribution, chronology, population trends, and factors affecting them (habitat availability and management).

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Chronology and peaks of waterbird movements, temporal composition of migrants, and factors affecting turnover rates at stopover sites.

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Distribution, abundance, conditions, and ownership of wetlands and other important waterbird habitats, how they are affected by climatic patterns and human activities, and where there is potential to restore and enhance additional waterbird habitat.

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Analyze existing areas of breeding habitat and recently altered shoreline to determine potential breeding areas (FY 2012).

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

### Threats and threats assessment:

1. **Competition and Predation** of nesting and foraging habitat.

#### Research needed:

- Research involving habitat availability, relationships with gulls (specifically, ring-billed gulls [*Larus delawarensis*]), double-crested cormorants (*Phalacrocorax auritus*), and other competitors and food requirements are key areas that need further study (Hyde 1997).

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: Unknown at this time)

## Common Tern (*Sterna hirundo*): Great Lakes Focal Area

- Waterbird nutritional requirements/food preferences.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: Unknown at this time)

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, vegetation succession.

**Research needed:** Assess how human disturbance affects waterbird foraging and breeding, and ways to reduce these impacts.

- Post-construction monitoring at Peace Bridge, related to habitat displacement of the structure.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: NYFO staff time)

- Pre- and post-construction monitoring for on- and off-shore wind projects.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: NYFO staff time)

- Survey to identify potential areas of overlap for nuclear development and common tern habitat.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: NYFO staff time)

- Review Great Lakes water level data and impacts to existing habitat.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO, U.S. Geological Survey [USGS]; Cost: NYFO staff time)

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

**Research needed:** Assess how human disturbance affects waterbird foraging and breeding, and ways to reduce these impacts.

4. **Climate change;** changes in habitat community structure and changes in prey base during breeding season.

**Research needed:**

## Common Tern (*Sterna hirundo*): Great Lakes Focal Area

- Determine changes in species distribution and population sizes due to climate change (especially the impacts of flooding and rising water levels on existing habitat).

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO, USGS; Cost: NYFO staff time)

### 5. Environmental contaminants.

#### Research needed:

- Assess the effects of contaminants on waterbirds, especially at Great Lakes Areas of Concern (AOCs) and Confined Disposal Facilities that are used by foraging birds.

(Who: NYSDEC, NYFO, U.S. Environmental Protection Agency [USEPA] through Great Lakes Research Initiative [GLRI]; Cost: NYFO staff time)

#### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Ducks Unlimited (DU), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, USEPA through GLRI, and other Great Lakes funding sources.

#### *Population goal(s) for New York State:*

Increase to 2,500 pairs (ACJV 2007). The State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) indicated a need to develop a long-term plan that established population objectives for beach and island ground-nesting birds (common tern) and recommended appropriate management options. Currently, NYSDEC recommends protecting existing common tern habitat and creating new habitat to expand nesting opportunities (NYSDEC 2005).

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Objectives: Increase local populations through the protection, preservation, and/or restoration of common tern nesting and foraging habitat along the Great Lakes shoreline.

#### 1. Competition and Predation of nesting and foraging habitat.

- a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects.
- b. Other strategies may result from research need noted above.



## **Common Tern (*Sterna hirundo*): Great Lakes Focal Area**

- 2. Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, vegetation succession.
  - a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas.
  - b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, and nesting habitat improvement projects (including artificial nesting platforms).
  - c. Other strategies may result from research need noted above.
- 3. Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.
  - a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding, foraging, and migration areas.
  - b. Other strategies may result from research need noted above.
- 4. Changes in habitat community structure and changes in prey base during breeding season due to climate change.**
  - a. Identify potential future habitat areas, above current water levels, and protect or restore the habitat for common terns.
  - b. Other strategies may result from research need noted above.
- 5. Environmental contaminants.**
  - a. Evaluate and prioritize USFWS Natural Resource Damage Assessments (NRDA) along the Great Lakes.
  - b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the “Fish Tumors” Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014).
  - c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - d. Other strategies may result from research need noted above.

### **CONSERVATION DELIVERY**

# Common Tern (*Sterna hirundo*): Great Lakes Focal Area

On-the-ground actions using strategies to address threats for FY 2010-2012

## 1. Competition and Predation of nesting and foraging habitat.

- a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects.
  - i. No work identified at this time.
- b. Other actions may result from research need noted above.

## 2. Loss of habitat due to island/shoreline development, water level management of the Great Lakes, vegetation succession.

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas.
  - i. Create map or shapefile of existing and potential common tern breeding and foraging areas for all NYFO programs (2011-2012) (IT).
  - ii. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013). (CPA)
- b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, nesting habitat improvement projects (including artificial nesting platforms).
  - i. Restore common tern habitat in the Niagara River (Natural Resources Damage Assessment and Restoration [NRDAR] Love Canal Settlement: 2012-2013).
- c. Other actions may result from research need noted above.

## 3. Fragmentation of habitat due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

- a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in common tern breeding, foraging, and migration areas.
  - i. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013) (CPA).
- b. Other actions may result from research need noted above.

## Common Tern (*Sterna hirundo*): Great Lakes Focal Area

4. **Changes in habitat community structure and changes in prey base during breeding season due to climate change.**
  - a. Identify potential future habitat areas above current water levels and protect or restore the habitat for common terns.
    - i. No work identified at this time.
  - b. Other actions may result from research need noted above.
5. **Environmental contaminants.**
  - a. Evaluate and prioritize USFWS NRDA along the Great Lakes.
    - i. Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo Potential Responsible Parties (PRPs) including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Tonawanda Subarea (of the Buffalo/Niagara Rivers NRDA case) (2011-2013) (EC).
  - b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the “Fish Tumors” Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2013).
    - i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010) (2011-2013) (EC).
    - ii. Assess the “Fish Tumors” Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats; work will commence in early summer 2011(2011-2013) (EC).
    - iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: 2011-2013) (EC).
  - c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
    - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to common terns and/or their habitat (2011-2013).
  - d. Other actions may result from research need noted above.

# Common Tern (*Sterna hirundo*): Great Lakes Focal Area

## OUTREACH

- Create a Fact Sheet to educate and encourage landowners to control predators that represent significant threats to the viability of species-at-risk such as common tern.

## MONITORING

- Development of protocols to measure progress/success for any common tern habitat enhancement and/or restoration projects developed and constructed.
- Seek funding and support for monitoring.

## Partners

USEPA, USGS, NRCS, NYSDEC, County SWCD, TNC, DU, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, and Haudenosaunee Confederacy.

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([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

## **Common Tern (*Sterna hirundo*): Great Lakes Focal Area**

USFS. 2001. Draft Conservation Assessment for Common tern (*Sterna hirundo*). October 2001. [http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/bird\\_Sterna\\_hirundo-CommonTern.pdf](http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/bird_Sterna_hirundo-CommonTern.pdf).

# Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

## Houghton's Goldenrod Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

small white lady's slipper orchid, yellow lady's slipper orchid, beaked spike-rush, creeping juniper, grass-of-Parnassus, Labrador tea, low nut-rush, eastern massasauga, Ohio goldenrod, bog goldenrod, sticky false asphodel, tufted bulrush, marsh valerian, white camus

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Houghton's goldenrod (*Solidago houghtonii* Torrey & A. Gray [alt. *Oligoneuron houghtonii* (Torr. & A. Gray) Nesom in New York], Asteraceae) (HOGO) is a clonal, perennial plant found almost exclusively along the northern shores of Lake Huron and Lake Michigan in the United States and Canada. The New York population is a distinct outlier and occurs in Bergen Swamp, Genesee County, New York. This site is protected by the Bergen Swamp Preservation Society whose mission statement is to "preserve inviolate for all times" the lands under its supervision.

HOGO occurs exclusively in calcium-rich wetlands ranging from calcareous beach flats and interdunal beach swales, limestone pavement alvars, and marl fens. These occupied habitats are essentially functionally related to the Niagara Escarpment and its landforms. The New York population occurs in a marl fen that is actively depositing marl, which is extremely uncommon. In general, HOGO occurs in habitats experiencing some dynamism in disturbance levels either through wind and wave action or changing water levels resulting in periods of population decrease through destruction and increase through recolonization.

HOGO forms dense, multistemmed genets (clumps) composed of many ramets (individual stems) that can fragment and promote vegetative propagation. This species is also known to be self-incompatible, and, therefore, requires an insect vector for successful pollination. While sexual reproduction does not appear to be hindered in this species, vegetative propagation is an important component of its reproduction.

Flowering occurs in August through early September and is characterized by a flat-topped inflorescence comprised of approximately 20-30 heads of 20-30 pale to bright yellow flowers with 6-9 ray florets and several disc florets. Individual plants can reach 30-60 cm in height and have predominately elongated, acute, linear-oblong basal leaves that are about 20 cm long and 20 mm wide with more scattered cauline leaves up the stem.

Among the possible candidates of similar species, grass-leaved goldenrod (*Solidago graminifolia*) and Ohio goldenrod (*Solidago ohioensis*) are among two of the most superficially similar and can be found in close proximity to HOGO populations. The former can be

## Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

distinguished by its more leafy stem and lacking basal leaves as well as having narrower leaves and smaller floral parts. The latter can be distinguished by its larger size and broader leaves. There are additional, more technical floral and pubescence characters that can be used to distinguish among these species.

Understanding HOGO is complicated by its uncertain taxonomic history and standing. It is commonly accepted that HOGO is a genetically-isolated offspring of hybrid origin from other extant goldenrods (*Aster* and *Solidago* spp.). The debate concerning this species' origins is long and complex and involves several possible progenitors including Ohio goldenrod (*S. ohioensis*), upland white goldenrod (*A. ptarmicoides*), Riddell's goldenrod (*S. riddellii*), and giant goldenrod (*S. gigantea*) (e.g., Morton 1979, Semple et al. 1999, Laureto 2010). Of added confusion is the taxonomic status of the New York population as there is not yet a clear conclusion as to whether or not it represents an oddity within the species or a unique species unto itself (i.e. Pringle 1987). Laureto (pers. comm.) has stated that another inland, outlier population in Michigan is not HOGO and represents a unique species, putatively classified as *Solidago vossii*. Laureto (2010) recently provided an in-depth genetic analysis of HOGO that points to a single speciation event and shared origin for all other extant populations, although this research has yet to be fully evaluated or published through peer review.

**Justification for species selection:** HOGO is a Federally-listed threatened species (listed threatened 1988) as well as a New York State-listed endangered species. As of 2010, including the putative *S. vossii* population, there were 94 reported sites predominantly in Michigan (76 sites) and Canada (17 sites), as well as one site in eastern New York. Approximately 27,000 mature, flowering individuals have been estimated to occur in Canada where HOGO has been down-listed to a species of special concern (COSEWIC 2005). There are no known quantitative estimates for total U.S. population sizes, although 41 (including New York) of the most viable occurrences are located entirely or partially on protected lands owned or managed by the State or Federal government, or non-governmental organizations.

HOGO habitat is highly-specific, calcareous wetlands generally along the coast of the Great Lakes, and as a result, there has been a great deal of focus on habitat protection. This has been juxtaposed with a high concentration of impact from coastal development including infrastructure (the majority of sites in Michigan are closely paralleled by highways) and residential pressures that fragment and destroy populations. Concurrent changes in hydrology through these activities can permanently dewater or flood areas of suitable habitat, resulting in species loss. Additionally, changes in overall lake level regime can either effect similar changes if maintained, or result in habitat degradation through increased competition if stabilized at a particular level. Although listing will not prevent private landowner loss, it has allowed for the recognition and protection of this species on Federal lands and in conjunction with Federal projects.

One of the most pertinent threats to HOGO is physical destruction through human activity. Off-road vehicle (ORV) use in coastal areas has resulted in destruction of habitat and HOGO individuals. Additionally, unauthorized and excessive foot traffic through sensitive areas has much the same effect. These activities are often difficult to control and prevent and have been a continuing struggle during this species' recovery.

## Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

Invasive species can be a significant detriment to rare plant conservation as they can crowd out native species, introduce allelopathic chemicals, and alter physical gradients in suitable habitats. This can be especially pronounced in highly productive wetland habitats where aggressive invaders can become a monoculture representing a significant proportion of the biomass. The quantities of excess evapotranspiration and detritus input resulting from this level of invasion can dramatically alter water levels and nutrient cycling/composition within these systems and cause significant habitat alteration and species loss.

Although there has been significant progress in identifying, and in some cases protecting, new and existing HOGO sites, the population status at most sites has not been updated for at least ten years. Even sites on public lands that are considered protected have little or no history of observation and may, in fact, be essentially unprotected due to unmonitored threats. HOGO occurrence in a highly-limited habitat and the continual pressures and destruction arising from these pressures indicates that any losses in this species cannot be replaced. It is unlikely that habitat will increase, and although this species can establish and spread readily, loss and fragmentation of this species' habitat will progressively decrease overall population size and continue to threaten HOGO recovery into the future.

**State contribution to overall species population:** HOGO is found predominantly in coastal Michigan and Canada along the northern shores of Lakes Michigan and Huron, although a few outliers are known to exist. The New York population is the most severe of these outliers as it occurs ~225 miles from the nearest population and in an atypical, noncoastal habitat. While its current taxonomic status is not definite, it may serve as an important genetic and physical refugium for this species in the event of losses in shoreline areas. The population was estimated in 1992 as "hundreds of plants" (as cited within U.S. Fish and Wildlife Service [USFWS] 1997), but a more recent quantitative census recorded 771 plants in two locations associated with the two marl rooms present at the site (Young 2008). After several successive attempts at additional surveys in the few suitable habitats this species prefers, it is felt that the Bergen Swamp population is the only location in New York (Young, S.M., pers. comm.).

### Threats and threat assessment:

Threats (See Recovery Plan for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Habitat loss to development and physical destruction (e.g., foot traffic, ORVs) are the primary threats to this species via destruction and degradation of coastal habitats. The New York population is located in an inland fen on a private nature reserve, so this threat is minimal with regard to physical destruction. However, as marl fens depend entirely on having an abundance of calcium-rich groundwater flowing through them, modifications or contamination of the groundwater could have a dramatic effect on this species.

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**



## Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

- A. The Bergen Swamp Preservation Society has established protocols for scientific studies that limit researcher impacts on this population. Additionally, the site location is relatively inaccessible; therefore, additional human pressures are considered limited. <http://www.bergenswamp.org/research.htm>

### Factor C. Disease or predation:

- A. As with other goldenrod species (*Solidago* spp.), herbivory and parasitism are common, but not chronic in this species.

### Factor D. The inadequacy of existing regulatory mechanisms: NA.

### Factor E. Other natural or manmade factors affecting its continued existence:

- A. Limited disturbance cycles can result in excessive competition and population decline. Invasive species have become a serious concern in Bergen Swamp, specifically common reed (*Phragmites australis*) and more recently false brome (*Brachypodium sylvaticum*) (Young, S.M., pers. comm.).

### Recovery Goals

**Range-wide Recovery Goals/Objectives:** Protect all known occurrences of the species or 30 distinct, self-sustaining occurrences. This objective has not been revised since 1998 and a current objective level or species status is still in review. Minimally, a census of known sites will be necessary in order to evaluate the current recovery status.

**Conservation goal(s) for New York State:** Promote viability in the known population in order to contribute to the required viable population level needed to delist the species.

**Research/Actions needed:** Certain actions will focus primarily on biological planning research activities in order to understand the current and future status of this population and its threats. Specifically, the following:

- [Coordinate with the East Lansing Field Office \(ELFO\) and species lead with regard to the current 5-year review, in review \(FY 2011\). Recovery Task 1.1.2. \(Endangered Species \[ESA\]\)](#)
- [Establish an open access research permit with the Bergen Swamp Preservation Society \(FY2011\). Recovery Task 1.2. \(ESA\)](#)
- Conduct site visits and population counts on five-year intervals to continue current population monitoring (FY 2013, \$5000). Recovery Task 2.2.
- Fully review taxonomic literature in order to assess the current knowledge about the population status and possible listing actions (FY 2012). Recovery Task 5.1.

## Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

- Measure water level and chemistry during site visits to evaluate hydrologic impacts (FY 2013, \$500). Recovery Task 4.
- Determine the groundwater watershed area and evaluate possible threats to groundwater quality and flow (FY 2013). Recovery Task 4.

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan (1997) [http://ecos.fws.gov/docs/recovery\\_plan/970917b.pdf](http://ecos.fws.gov/docs/recovery_plan/970917b.pdf)
- 5-Year Review (2011), in review
  - Next 5-year review anticipated in 2016

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- Develop control methods and/or habitat manipulation necessary to control invasive species (FY 2011, \$0). Recovery Task 4.
- Assess watershed dynamics in relation to water levels and chemistry in order to develop watershed management protocols, if necessary (FY 2014, \$0). Recovery Task 4.

### CONSERVATION DELIVERY

#### *On-the-ground actions using strategies to address threats FY 2010 - 2012*

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Limit possible habitat and physical destruction
  - 1. Coordinate with Bergen Swamp Preservation Society in order to maintain the integrity of the site (Recovery Task 1.4.1) (ES)

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
No actions planned

**Factor C. Disease or predation:** No actions planned

**Factor D. Other natural or manmade factors affecting its continued existence:**

## Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

### A. Control invasive species

1. Implement developed invasive species control measures (FY 2012-2013, [cost unknown until extent of problem and method of control established])

### B. Manage watershed inputs

1. Dependent upon developed protocols (FY2014-[continuing], \$Unknown)

## OUTREACH

- Construct a HOGO web page for the NYFO site. Recovery Task 3.1. (ESA and Information Technology [IT])

## MONITORING

- A. Monitor/measure invasive species control method responses (FY 2014, \$0 [conducted in conjunction with population counts]). Recovery Task 2.11.

### *Partners*

Bergen Swamp Preservation Society, New York State Department of Environmental Conservation (NYSDEC), New York Natural Heritage Program (NYNHP)

### *References*

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## **Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area**

submitted to the Bergen Swamp Preservation Society. New York Natural Heritage Program, Albany, NY.

# Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

## Indiana Bat Species Action Plan

### FOCAL AREA: GREAT LAKES

### BIOLOGICAL PLANNING

#### *Other species benefitting:*

Eastern small-footed, little brown, tri-colored, northern, big brown

#### *Introduction to species*

**Species information:** The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h (diameter at breast height). Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at <http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf>.

Streams associated with floodplain forests and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.*, old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service [USFWS] 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

**Justification for species selection:** The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

**State contribution to overall species population:** New York used to have ~11% of wintering Indiana bats rangewide before White-nose syndrome (WNS). New York still has the largest number of wintering (and likely summering) Indiana bats in the region. The USFWS has proposed recovery units in the draft recovery plan (Plan) (USFWS 2007) and New York is part of the Northeast Recovery Unit.

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

### Threats and threat assessment:

Threats<sup>10</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** *See the Plan for in-depth discussion (USFWS 2007, page 71).*

- A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) have been identified as long-standing and ongoing threats to the species.
- B. Winter – potential to impact hibernacula with gas drilling, filling, etc.
- C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development
- D. Fall (swarming) – same pressures as spring/summer habitat

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** *See the Plan for in-depth discussion (USFWS 2007, page 80).*

- A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

**Factor C. Disease or predation:** WNS is most significant threat in New York. Predation is also a threat.

**Factor D. The inadequacy of existing regulatory mechanisms:** *See the Plan for in-depth discussion (USFWS 2007, page 90).*

- A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

**Factor E. Other natural or man-made factors affecting its continued existence:** *See the Plan for in-depth discussion (USFWS 2007, page 91).*

- A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.
- B. Anthropogenic factors that may affect the continued existence of Indiana bats include

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<sup>10</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and polychlorinated biphenyls [PCBs]), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

### *Recovery Goals*

**Range-wide Recovery Goals/Objectives:** Intermediate - reclassification, Long-term - delisting

**Conservation goal(s) for New York State:** The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit.

### **Research/Actions needed:**

- A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions – not included in recovery plan – WNS will eventually have a separate plan).
- B. WNS-related research is needed to better understand the threat.
  - 1. Assist with requests for proposals (RFPs) as requested (Endangered Species Act [ESA]).
  - 2. Review proposals if requested to be on review team (ESA).
  - 3. Provide grant oversight for FY08 and FY09 projects (FY2011-2012) (ESA).
  - 4. Assist with field work (FY2011) (ESA).
- C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6)
  - 1. Assist with Indiana bat modeling shared decision-making (SDM) effort until completion (ESA)
    - a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3) (FY11)
    - b. Participate in calls during Beta testing (FY11)
    - c. Attend workshop to test model (FY11)
    - d. Assist with roll-out of model (FY11)
    - e. Provide technical assistance to Field Offices (FOs) with use of model (FY11,12,13)
- D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4)

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

1. Environmental Contaminants (EC) WNS research - send all samples out for analysis (FY11, EC)
2. Prepare 2009 bat mercury Natural Resource Damage Assessment and Restoration (NRDAR) report for Onondaga Lake (FY11, EC)

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (USFWS 2007)
- Last 5-year review completed 2009 (USFWS 2009)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

#### A. Assist R3 with finalizing Recovery Plan as requested (FY11, NYFO ESA)

B. Reduce current threats at known hibernacula (primarily WNS-related actions - not included in recovery plan - WNS will eventually have a separate plan) (Recovery Action 1.1.1)

##### 1. WNS National Plan

- a. Provide technical assistance during USFWS and/or public review periods (FY2011) (ESA)
- b. Participate in Communications Group (FY2011,12,13, NYFO ESA)

##### 2. WNS-related research is needed to develop conservation strategies to respond to WNS.

- a. Assist with captive bat management structured decision making process (FY10, 11, NYFO ESA)

C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.

##### 1. Participate in multi-region project to develop guidance (FY10,11, NYFO ESA)

##### 2. Coordinate first R3, Regions 4 and 5 (R4, R5) threatened and endangered species wind call - 2/3 (FY10)[completed]

##### 3. Participate in multi-region calls (FY10-13, NYFO ESA)



## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

- D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)
  - 1. Assist R3 with this effort
- E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)
- F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)
  - 1. Assist with funding automation of acoustic survey data analysis
    - a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system (FY10,11) (ESA)
    - b. Assist with Phase 1 grant agreement (FY10)[completed]
  - 2. Determine whether netting guidelines should be revised to include acoustic detectors
    - a. Participate in Indiana bat/Wind Initiative protocol workgroup (FY10)[completed]
    - b. Participate in team to revise Indiana bat survey protocols as requested (FY11) (ESA)
  - 3. Assist New York State Department of Environmental Conservation (NYSDEC) with acoustic transect project
    - a. Conduct 1 acoustic transect route 2-3 nights (FY10)[completed]
    - b. Conduct 1 acoustic transect route 2-3 nights (FY11, NYFO any program; ESA to coordinate)
- G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)
  - 1. Fund or otherwise coordinate wind project research
    - a. Flight altitude?
    - b. Migratory pathways?
    - c. Impacts of wind turbines on resident v. migrating bats?
    - d. Minimization/mitigation measures?
    - e. Post-construction monitoring techniques?
- H. Regional coordination role
  - 1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads (FY11) (ESA)

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

2. Potential outcomes:
  - a. Provide updates to FOs on literature, information from other regions
  - b. Provide technical assistance to FOs on formal consultations/Habitat Conservation Plans (HCPs)
  - c. Provide R5 comments on national issues (e.g., survey protocol updates)
  - d. Provide R5 end-of-year reporting info to R3
  - e. Maintain understanding of current literature
  - f. Participate in WNS-related projects as needed

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

#### Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

- A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)
  1. Army Compatible Use Buffer (ACUB) program has been initiated at Fort Drum. This is a great opportunity to target lands for protection that meet Town, Army, and conservation goals. Partners include Army, Ducks Unlimited (DU), Ontario Bays Initiative (OBI), NYSDEC
    - a. Participate in meetings/calls to target Indiana bat lands (FY11-13) (ESA)
    - b. Provide technical assistance to Fort Drum with easement language (FY11, NYFO ESA)
    - c. Complete consultation on ACUB program (FY11, NYFO ESA)
- B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)
  1. Fort Drum
    - a. Ensure implementation of conservation measures of existing Biological Opinion (BO) (also see Action 2.6)
    - b. Participate in semi-annual Natural Resources Branch Meetings
      - i. Attend at least one in person and one over the phone (FY10,11,12) (ESA)
    - c. Recognize the Army for assisting with recovery actions
      - i. Nominate for Military Partnership Award - January 2010 (FY10) [completed-not awarded]

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

- ii. Send recognition letter to Army (FY11) (ESA)
  - d. Assist Fort Drum with WNS research/monitoring
    - i. Assist with summer transmission study
      - Assist with capture and processing of bats at condo 1-3 nights (FY10,11, NYFO ESA)
- C. Encourage habitat protection through acquisition/easements
  - 1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants
  - 2. Provide technical assistance to the Natural Resources Conservation Service (NRCS) for potential easements
- D. Minimize adverse impacts to Indiana bat during project reviews (Recovery Action 2.6)
  - 1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor
    - a. Review annual reports from
      - i. Fort Drum (FY10-13, NYFO ESA)
      - ii. Fort Drum Connector (FY10,11,12, NYFO ESA)
  - 2. Habitat protection through informal and formal consultations and HCPs (NYFO ESA).
    - a. Assist with development of measures for NiSource HCP (ESA)
    - b. Develop conservation framework, including standard conservation measures, for residential and commercial projects (ESA)
    - c. Complete St. Lawrence Wind consultation (ESA)
    - d. Participate in consultation with Fort Drum (FY2011, NYFO ESA)

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
No work planned for FY 2011.

**Factor C. Disease or predation:** Need to determine what conservation measures will be available for WNS-response.

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Review NYSDEC permit conditions (FY11) (ESA)
- B. Coordination Regional review of Indiana bat permit conditions (ESA)

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

**Factor E. Other natural or man-made factors affecting its continued existence:** Wind project work being addressed through consultations/HCPs (see above)

### OUTREACH

- A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat including development of guidelines, best management practices (BMP), land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)
- B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)
  - 1. Current Indiana bat/WNS display
    - a. Continue to rotate display at nature center (any NYFO program; ESA to coordinate)
    - b. Update display at least once/year (ESA)
  - 2. New Indiana bat display
    - a. Provide technical assistance to the U.S. Forest Service (USFS) in the development of a new display (ESA)
    - b. Receive transfer funding from USFS and develop contracts to complete display (FY2011, Cost:\$10-15,000 [\$5,000 from USFS, rest from WNS and NYFO]) (ESA)
  - 3. New Indiana bat cave display
    - a. Develop new cave display (FY2012, Cost: \$1000)
  - 4. Attend meetings/workshops
- C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)
  - 1. Update Fact Sheets and web materials (NYFO ESA and R5) (FY10,11)
- D. Assist with Freedom of Information Act (FOIA) responses as needed

## Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

### MONITORING

- A. Survey winter populations of Indiana bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)
  - 1. Assist NYSDEC with 2010 hibernacula surveys (FY10)[completed]
    - a. Glen Park
  - 2. Assist NYSDEC with “Indiana bat on year” winter 2010-2011 surveys (FY11) (ESA, staff costs)
    - a. Glen Park (St. Lawrence focal area)

Review and track recovery progress.

#### *Partners*

NYSDEC, R3, R4, R5 FOs, Montezuma National Wildlife Refuge (NWR), U.S. Army, USFS, New York State Department of Transportation (NYSDOT), Federal Highway Administration (FHWA), OBI, DU, USGS

#### *References*

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U.S. Fish and Wildlife Service, Bloomington, IN.

# Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

## Lake Sturgeon Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

American eel, walleye, redhorse/white suckers, mooneye

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Lake sturgeon is a long-lived, late-maturing species that inhabits large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins. Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warm water species with water temperature and depth preferences of low 50s to mid-60°F and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Life history characteristics of lake sturgeon are unique with respect to other fishes. Females mature between 14 and 33 years, males between 8 and 12 years. Spawning occurs only once every 2-7 years for males and 4-9 years for females. As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population spawns during a given season. Spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-60-°F. The typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

**Justification for species selection:** In the past, sturgeon have comprised an important biological component of the Great Lakes fish community. By the early 1900s many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and reduced water quality. Within the Great Lakes basin, the lake sturgeon population is estimated to be at 1% of historic abundance levels. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. In New York State and the Province of Ontario, lake sturgeon are listed as a threatened species. In addition, the lake sturgeon is a Federal trust species and has been identified as a priority species under the New York Field Office (NYFO)-Fish Enhancement, Mitigation, and Research Fund (FEMRF).

**State contribution to overall species population:** Currently there are remnant populations of lake sturgeon occurring in Upper Niagara River/Lake Erie, Lower Niagara River, St. Lawrence River (middle corridor), St. Lawrence River (lower corridor), and the Grasse River. Among these remnant populations we see varying population trends, ranging from populations that are recovering to populations that remain very low, but apparently stable. Within the State, the populations maintaining themselves today are recognized as being in five geographic units, contrasted to more than 12 units historically. The New York State Department of Environmental Conservation (NYSDEC) Lake Sturgeon Recovery Plan states the goal of maintaining these

## Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

5 units and restoring populations in three other units. The NYSDEC has stocked 6 waterbodies in efforts to establish populations in three other units.

### Research needed:

- Conduct surveys to determine current population levels and presence/absence. (Who: NYSDEC, U.S. Geological Survey [USGS], Ontario Ministry of Natural Resources [OMNR], and U.S. Fish and Wildlife Service/Lower Great Lakes Fish and Wildlife Conservation Office/NYFO [USFWS/LGLFWCO/NYFO] to assist with lake sturgeon surveys to determine presence/absence and population densities, coupled with habitat investigation and evaluation of stocking initiatives; Cost: NYFO staff time)
- Complete a New York State Lake Sturgeon Management Plan.

(Who: USFWS [NYFO], NYSDEC, USGS, and Cornell University to assist with completion of New York State Lake Sturgeon Management Plan to address recovery, habitat restoration strategies and population goals; Cost: < \$30K, NYFO FEMRF funding)

### Threats and threat assessment:

#### 1. Loss of Spawning Habitat

##### Research needed:

- Conduct surveys to determine quantity and quality of known spawning habitat.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: NYFO staff time)

- Identify and prioritize areas for habitat restoration and enhancement.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, FEMRF funding)

#### 2. Barriers to Migration (including dams and impassable culverts).

##### Research needed:

- Identify barriers having an influence on lake sturgeon spawning migration and prioritize barrier removal.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, FEMRF funding)

- Conduct surveys to determine available sturgeon spawning habitat above existing barriers, in regards to both quantity and quality of habitat present.

# Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

(Who: NYSDEC, USGS, USFWS [NYFO] ; Cost : unknown at this time, FEMRF funding)

## 3. Environmental Contaminants.

### Research needed:

- Assess the effects of contaminants on lake sturgeon, especially at Great Lakes Areas of Concern (AOC) that are used by lake sturgeon.

(Who: NYSDEC, USFWS [NYFO], U.S. Environmental Protection Agency [USEPA] through Great Lakes Restoration Initiative [GLRI]; NYFO staff time)

- Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically the effects from polychlorinated biphenyls (PCBs), mirex, dioxin, mercury, and emerging contaminants.

(Who: USFWS [NYFO-Environmental Contaminants [EC]]; Cost: unknown at this time, Natural Resource Damage Assessment and Restoration [NRDAR], GLRI funding)

## 4. Invasive Species (and associated disease transmission).

### Research needed:

- Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.

(Who: USGS, academics; Cost: unknown at this time, FEMRF funding)

## 5. Climate change; changes in riverine discharge regimes.

### Research needed:

- Identification of climate change related impacts to lake sturgeon.

(Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

### *Partners/potential funding:*

USFWS/LGLFWCO, USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, New York Power Authority (NYPA) Cornell University, State University of New York-College of Environmental Science and Forestry (SUNY-ESF).



# Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

## *Population goal(s) for New York State:*

Currently, several agencies have published three population goals for lake sturgeon in the Lake Ontario/St. Lawrence River basin and these goals vary. The NYSDEC Lake Sturgeon Recovery Plan states the goals are to increase the number of naturally reproducing sturgeon populations in New York to 8 (up from 5) and the removal of the species from State-listing. The Great Lakes Fishery Commission stated goals are the rehabilitation of lake sturgeon populations including the expansion of sturgeon populations into favorable habitats and to enhance sturgeon spawning habitat. Their metric for success is based on a catch per unit effort (CPUE) of 0.1 sturgeon/net/night; CPUE rates observed from 2000 to 2007 ranged from 0 to 0.06 sturgeon/net/night. The OMNR, in a draft Lake Sturgeon Rehabilitation Plan, state goals as conserve and/or rehabilitate the existing self-sustaining lake sturgeon spawning populations with a minimum target of at least 750 sexually mature sturgeon in each system. This number was selected because it represents the minimum number thought to be present in remnant Great Lakes populations that are considered to be either stable or increasing in abundance. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Lake Ontario/St. Lawrence River basin.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of spawning habitat.**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
- b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (Partners for Fish and Wildlife [PFW]).
- c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations.
- d. Promote habitat restoration projects that control sediment entering riverine environments and reduce quality of spawning habitat.
- e. Facilitate reintroduction of lake sturgeon to their known former range.

#### **2. Barriers to migration (including dams and impassable culverts).**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

## **Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area**

- b. Work with partners to identify, prioritize, and remove sturgeon barriers.
- c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.

### **3. Environmental contaminants.**

- a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants.
- b. Evaluate and prioritize USFWS NRDA's along the Great Lakes.
- c. As part of GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014).
- d. Other strategies may result from research need noted above.
- e. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

### **4. Invasive Species (and associated disease transmission).**

- a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.

### **5. Climate change; changes in riverine discharge regimes.**

- a. Identify potential effects to lake sturgeon spawning habitat and water quality.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY2010-2012

### **1. Loss of spawning habitat and habitat function.**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
  - i. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon \(CPA\).](#)
- b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements.

## Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

- i. Work with PFW and NYSDEC to begin to identify opportunities for the placement of spawning substrate beds in tributaries to Lake Ontario (NYFO FEMRF funding) (PFW, FEMRF).
  - c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations.
    - i. Develop NYFO FEMRF Geographic Information Systems (GIS) Decision Support Tool to focus preservation efforts (NYFO FEMRF funding) (FEMRF).
  - d. Promote habitat restoration projects which also control sediment entering riverine environments.
    - i. Work with U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) to focus their programmatic efforts to reduce sediment input and agricultural run-off (USDA-NRCS funding).
  - e. Facilitate reintroduction of lake sturgeon to their known former range.
    - i. Facilitate the writing of a New York State Lake Sturgeon Management Plan (FEMRF funding) (NYSDEC, USGS, FEMRF).
    - ii. Assist the NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation. NYFO-FEMRF to provide equipment, assistance with INAD permits, and field assistance. (FEMRF funding) (FEMRF).
    - iii. Assist the NYSDEC with 5-year population assessments through providing field assistance and PIT tagging supplies (FEMRF funding, , \$10K) (NYSDEC, FEMRF).
- 2. Barriers to migration** (including dams and impassable culverts).
- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
    - i. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA).
  - b. Work with partners to prioritize, identify, and remove sturgeon barriers.
    - i. Develop FEMRF GIS Decision Support Tool to prioritize tributaries for restoration activities (FEMRF funding) (FEMRF).

## Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

- c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.
  - i. Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range (NYSDEC, FEMRF).

### 3. Environmental Contaminants.

- a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants.
  - i. Facilitate the investigation of the effects of contaminants on the survival and reproductive success of lake sturgeon (FEMRF, NRDAR, GLRI funding).
- b. Evaluate and prioritize USFWS NRDA along the Great Lakes.
  - i. Manage Buffalo/Niagara Rivers Case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Tonawanda subarea of the Buffalo/Niagara rivers NRDA case (2010-2013) (EC).
- c. As part of GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the “Fish Tumors” Beneficial Use Impairment for the Niagara River AOC (potentially 2010 – 2014).
  - i. Evaluate emerging contaminants in Rochester Embayment AOC. Pilot study on emerging contaminants in sediment, water, and fish was initiated in September 2010 for Rochester embayment (CPA).
  - ii. Assess the “fish tumors” Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (Niagara River pilot study will commence in early summer 2011). (EC)
  - iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependant on USEPA funding) (EC).
- d. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to state and federal Superfund sites.
  - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to lake sturgeon and/or their habitat (2010-2013) (CPA).

# Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

## 4. Invasive Species (and associated disease transmission).

- a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.
  - i. No work identified at this time.

## 5. Climate change; changes in riverine discharge regimes.

- a. Identify potential effects to lake sturgeon spawning habitat and water quality
  - i. Work with National Weather Service to create models for determining climate change related precipitation impacts to spawning habitat and tributaries.

## OUTREACH

The New York State Lake Sturgeon Recovery Plan (pending), when complete will have an outreach component identifying our path forward.

The NYFO has FEMRF and EC web pages with “ongoing projects” on our website.

Assist NYSDEC with lake sturgeon placard placement and fishermen education.

## MONITORING

- Work with partners to monitor lake sturgeon habitat restoration and enhancement projects, including spawning substrate additions and use of habitat post-removal of barriers.
- Monitor status and contribution to the population of stocked eggs/sturgeon as part of reintroduction strategy.
- Establish benchmarks for success based on New York State Lake Sturgeon Management Plan (pending).

### *Partners*

USFWS (LGLFWCO), USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, NYPA, Cornell University, SUNY-ESF

### *References*

Bouton, D. 1994. A Recovery Plan for Lake Sturgeon (*Acipenser fulvescens*), NYSDEC publication.

## **Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area**

Carlson, D. 2000. A Recovery Plan for the Lake Sturgeon in New York State, NYSDEC publication, updated.

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<http://www.glfco.org/lakecom/loc/slr/co>.

Farrell, J.M., R. Colesante, D. Dittman, J. Johnson. 2009. Lake Sturgeon Population Enhancement as a Strategy for Improvement of Ecosystem Function and Controlling Invasive Species. Final Report. Submitted to the USFWS in fulfillment of a FEMRF award.

# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

## Massasauga Rattlesnake Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

spotted turtle, bog buckmoth, fen plant communities including Eastern larch, black huckleberry, *Vaccinium corymbosum*, *Acer rubrum*, *Carex lasiocarpa*, *Sphagnum spp.*

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The eastern massasauga rattlesnake (EMR) is a Federal Candidate species and a New York State listed endangered species. Habitat: early successional plant communities, open ponds, marshes, peatlands, old fields, and shrublands. Due to threats and its natural patchy distribution within its range, the sub-species is listed as endangered in New York [NY] and conservation efforts are being lead by state biologists. The NY role includes assisting New York State Department of Environmental Conservation (NYSDEC) and Bergen Swamp Conservatory with protection and habitat management of Bergen-Byron Swamp and adjacent lands.

**Justification for species selection:** The eastern massasauga rattlesnake is a Federal Candidate species and our goal is to preclude listing the species. Due to threats and its natural patchy distribution within its range, the sub-species is listed as endangered in New York.

**State contribution to overall species population:** Two known populations – Cicero Swamp Wildlife Management Area (CSWMA) in Onondaga County and Bergen-Byron Swamp in the Towns of Byron and Bergen, Genesee County. Bergen Swamp Conservatory manages Bergen-Byron Swamp, a protected 2,000-acre (810 ha) swamp and nature preserve. The preserve is 400 million years old. The Bergen Swamp Preservation Society was formed in 1935 to protect and preserve this delicate ecological environment. It was designated a National Natural Landmark in 1964. Population studies have been conducted and EMR numbers could increase with habitat management such as prescribed burns, mechanical brush clearing, and herbicide application of invasive species.

#### **Threats and threat assessment:**

Threats<sup>11</sup>:

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

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<sup>11</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area**

A. Habitat loss/degradation in the form of:

1. succession of peatlands to closed canopy and forest regeneration
2. wetland filling/drainage and urbanization

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

A. Illegal collecting is a threat.

### **Factor C. Disease or predation:**

A. Predators include carnivorous species (Johnson 1995) such as “weasels, mink, and coyotes, as well as [birds of prey], owls, and turkey.”

### **Factor D. The inadequacy of existing regulatory mechanisms:**

A. This is a threat and part of the reason for consideration for listing.

### **Factor E. Other natural or manmade factors affecting its continued existence:**

Other threats include:

- A. Genetic viability, loss of genetic diversity due to isolation
- B. Invasive species encroachment
- C. Illegal collecting

### ***Conservation Goals***

***Range-wide Goal:*** Preclude the need to list EMR

### ***Conservation goal(s) for New York State:***

Determine New York State goal for population

### **Research/Actions needed:**

Research needed:

- NYSDEC/State University of New York-College of Environmental Science and Forestry (SUNY-ESF) use of seasonal habitats
- Reintroduction
- Other habitat management plan
- Invasive species
- Genetics
- NYSDEC/SUNY-ESF EMR habitat requirements at Bergen
- Survey sites outside Bergen for potential available habitat in New York



# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

## *Partners/potential funding*

U.S. Army Corps of Engineers (USACE), NYSDEC, Bergen-Byron Swamp Conservancy grants

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- U.S. Fish and Wildlife Service (USFWS) Status Assessment for Eastern Massasauga (*Sistrurus c. catenatus*)1998
- NYSDEC Draft Recovery Plan (NYSDEC 2009)
- Cicero Burn Plan (NYSDEC 2009)
- State Wildlife Habitat Conservation Plan (NYSDEC 2009)
- USFWS Status Assessment for Eastern Massasauga (*Sistrurus c. catenatus*)1998
- P:\Endangered Species\recovery plans
- NYSDEC Draft Recovery plan for EMR (NYSDEC 2009)
- State Wildlife Habitat Conservation Plan  
[http://www.wildlifeactionplans.org/new\\_york.html](http://www.wildlifeactionplans.org/new_york.html)
- Annual Candidate Notice of Review (2009)  
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C03P>

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Address threat of habitat loss due to succession of peatland to closed canopy, forest regeneration.
  1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat.
- B. Address threats of habitat degradation due to invasive species encroachment.
  1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability.
- C. Address loss of habitat due to alternations in wetland hydrology, including wetland draining, urban run-off, and water quality degradation.
  1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands with a focus on wetlands that have suitable habitat.

# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

- D. Address population decline including those due to loss of individual snakes due to illegal collecting.
  - 1. Develop a reintroduction plan using results of genetics research.
  - 2. Develop a captive rearing plan.
  - 3. Develop a plan for enhanced protection of existing population.

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010-2012

### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Threat of habitat loss due to succession of peatland to closed canopy, invasive species, forest regeneration.
  - 1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied yet suitable habitat.
  - 2. Respond to Candidate Notice of Review to USFWS Region 3 (FY 2011) (Endangered Species [ESA])
- B. Habitat degradation and loss due to alternations in wetland hydrology, including wetland draining, urban run-off and water quality degradation.
  - 1. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands by:
    - a. Develop fact sheets and best management practices (BMPs) to minimize impacts to this species (New York Field Office [NYFO] staff). (ESA)
    - b. Post these fact sheets/BMPs on our website. (Information Technology [IT]).
    - c. Provide substantive comments on proposed actions with potential impacts on this species (FY 2011). (Conservation Planning Assistance [CPA], ESA)

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Address loss of individual snakes due to illegal collecting.
  - 1. Reintroduce after developing data on genetics and a reintroduction plan

### **Factor C. Other natural or manmade factors affecting its continued existence:**

## **Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area**

- A. Threats of habitat degradation due to invasive species encroachment,
1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability.
    - a. Assist NYSDEC and BSPS with habitat management.
    - b. Provide technical assistance to Bergen Swamp Preservation Society (BSPS) for Great Lakes Restoration Initiative (GLRI) proposal (FY 2010 completed)
    - c. [Grant oversight \(FY 2011\) \(ESA\)](#)
    - d. Provide technical assistance to BSPS
    - e. Pursue Candidate Conservation Agreement with Assurances (CCA) with NYSDEC and BSPS. Pursue CCA with R7.
    - f. Identify ways to protect habitat outside CSWMA and incorporate buffers.
    - g. Consider the affects of slender false brome grass on EMR.
- B. Reintroduction: Town of Arcadia in Wayne County (Reixinger and Peterson 1982). The Arcadia site is of interest because it appears to possess many habitat characteristics suitable for EMR. It consists of a basin containing an extensive floating bog mat at its north end and a series of shrubby and open peatland to the south. These peatlands are structurally and floristically similar to Cicero Swamp and offer numerous overwintering sites for EMR. The basin is bordered to the west and east by drumlins that are primarily forested, interspersed with old fields and agricultural lands (Johnson and Breisch 1992).

### **OUTREACH**

Coordinate with NYSDEC to design outreach exhibit for use in New York.

Increase public awareness and knowledge of the species through fact sheets posted on NYFO website.

Massasauga Rattlesnake USFWS Fact Sheet

### **MONITORING**

Monitor EMR response to habitat management

*Partners*

# Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

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NYSDEC Website - DRAFT Eastern Massasauga Recovery Plan- NYSDEC 2009 Fact Sheet: <http://www.dec.ny.gov/animals/7154.html>

NYSDEC State Wildlife Habitat Conservation Plan [http://www.wildlifeactionplans.org/new\\_york.html](http://www.wildlifeactionplans.org/new_york.html)

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USFWS Annual Candidate Notice of Review (2009)

<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=C03P>

USFWS websites: Fact Sheet: <http://www.fws.gov/midwest/endangered/reptiles/conserv.html>

USFWS. 2008. Species Assessment and Listing Priority Assignment Form for Eastern Massasauga (*Sistrurus catenatus catenatus*).

USFWS Q and A's about the Conservation of EMR:

[http://www.fws.gov/midwest/Endangered/reptiles/eama\\_qanda.html](http://www.fws.gov/midwest/Endangered/reptiles/eama_qanda.html)

USFWS - Handbook for Land Managers

2000 <http://www.fws.gov/midwest/Endangered/reptiles/pdf/eama-mgmt-guide.pdf>

# Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

## Piping Plover Species Action Plan

### FOCAL AREA: GREAT LAKES

#### *Other species benefitting:*

killdeer (M/B), spotted sandpiper (M/B), migrants in high concentrations, and Bird Conservation Region (BCR) 13 is very important (least sandpiper, pectoral sandpiper, dunlin, short-billed dowitcher, long-billed dowitcher), other shorebirds

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Great Lakes breeding population was listed as endangered in 1986. Critical habitat was designated for the Great Lakes breeding population in 2001. Piping plovers have not been seen using the eastern end of Lake Ontario for breeding since 1984.

**Justification for species selection:** Federally-listed endangered. State-listed endangered. New York Field Office (NYFO) is regional lead.

**State contribution to overall species population:** 17 miles of critical habitat along Lake Ontario. No current breeding population in New York - only occasional sightings during migration.

#### **Threats and threat assessment:**

Threats<sup>12</sup> (See 5-year review for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Shoreline development, vegetation encroachment, water level control

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** NA

#### **Factor C. Disease or predation:**

- A. Disease has emerged as a potential new threat (currently at a low level).
- B. Predation is a threat to adults, chicks, and nests.

#### **Factor D. The inadequacy of existing regulatory mechanisms:**

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<sup>12</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

- A. In the absence of the Endangered Species Act (ESA), there is insufficient regulatory protections.

## **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Disturbance by humans and pets.
- B. Wind projects.
- C. Climate change.
- D. Small population size/genetic diversity.

## ***Recovery Goals***

***Range-wide Recovery Goals/Objectives:*** To restore and maintain a viable population (95% or greater chance of persisting 100 years) to the Great Lakes region and remove the Great Lakes population from the list of Threatened and Endangered Species by 2020.

***Conservation goal(s) for New York State:*** No specific goal for New York. Great Lakes states outside of Michigan need to have 50 breeding pairs total. New York may be able to contribute to that recovery criterion.

**Research/Actions needed:** Survey known, historic, and potential breeding sites to locate breeding piping plovers (Recovery Action 1.21).

- Provide training in identification of piping plovers to SeaGrant interns (NYFO ES)
- [Assist with 2011 International Census \(1 day, FY2011, NYFO any program; ES to coordinate\)](#)

Target bird watching groups in each state and Ontario and request assistance in locating migrating piping plovers (Recovery Action 3.2).

Quantify other factors (disturbance, predation) limiting piping plovers at current and historic breeding sites (Recovery Action 4.212).

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan 2003 (Service 2003)
- 5-year review completed September 2009 (Service 2009a)
  - Next 5-year review anticipated in 2014

# Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

- Spotlight Species Action Plan 2009 (Service 2009b)
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain (BCR 13) (Service 2007)

## Research/Actions needed:

Develop a state-by-state wintering and migration habitat use atlas (Recovery Actions 2.12, 2.13, 2.16).

Conduct studies to understand potential effects of wind turbine generators that may be located or proposed for the Great Lakes, nearshore, and within or between nesting or foraging habitats. Information needs include migration routes and altitude, flight patterns associated with breeding adults and post-fledged young of the year foraging at nearby sites that are not contiguous with nesting habitats, and avoidance rates under varying weather conditions.

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

- A. Incorporate protection of breeding areas into land use plans and existing permitting processes (Recovery Action 1.341).
  1. [Request surveys prior to work done in critical habitat areas \(FY2011-2013, NYFO ES and Conservation Planning Assistance \[CPA\]\)](#)

**Factor B. Disease or Predation:** No work planned in next 2-3 years.

**Factor C. The inadequacy of existing regulatory mechanisms:** No work planned in next 2-3 years.

**Factor D. Other natural or manmade factors affecting its continued existence:** Participate in Great Lakes Wind Conferences and Initiatives.

## OUTREACH

Nothing currently identified for next 2-3 years.

## MONITORING

Review and track recovery progress.

[Provide sighting information to Region 3 for annual Regional Data Collection \(RDC\) \(FY2011-2013, NYFO ES\).](#)

# Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

## *Partners*

New York State Natural Heritage Program, New York State Department of Environmental Conservation, The Nature Conservancy, Audubon Society

## *References*

U.S. Fish and Wildlife Service. 2003. Recovery plan for the Great Lakes piping plover (*Charadrius melodus*). Fort Snelling, Minnesota.

U.S. Fish and Wildlife Service. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13).

U.S. Fish and Wildlife Service. 2009a. Piping Plover 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Northeast Region, Hadley, Massachusetts, and Midwest Regions' East Lansing Field Office, Michigan.

U.S. Fish and Wildlife Service. 2009b. Draft Spotlight Species Action Plan for the Great Lakes Population of the Piping Plover (*Charadrius melodus*). U.S. Fish and Wildlife Service, East Lansing, MI.



## LONG ISLAND FOCAL AREA

The Long Island Focal Area (LIFA) is located in the extreme southeastern corner of New York and contains approximately 1,413 square miles or 2.6% of the state. The focal area is located entirely on Long Island and its associated islands. The LIFA contains the glacially-determined transition from the forested, Long Island Sound Coastal Lowland in the northwest with local relief of 20-50 feet to the sandy Long Island/Barrier Islands and Coastal Marshes to the south and east with a local relief of 0-10 feet. Overall elevation range within Long Island is 0-250 feet. This focal area is characterized by its maritime climate, coastal sounds and bays, barrier beaches, and barrier and bay island systems.

Long Island is the longest and largest island in the continental United States and represents one of the most important areas commercially and biologically in the United States. It is also one of the most populous islands in the world. Four New York counties are included within the LIFA boundary including Kings, Queens, Nassau, and Suffolk counties. Approximately 7,400,000 people live on Long Island, concentrated primarily in the western third of the island associated with the New York Metropolitan Area boroughs of Brooklyn and Queens. Land uses transition from heavily urbanized in the western portion of the island grading into successively less dense suburban areas eventually converting to primarily agricultural and forest lands in the eastern end.

This focal area was selected because it contains significant coastal and marine resources. The Long Island Wildlife Refuge Complex is located in this focal area and consists of nine National Wildlife Refuge Units – Amagansett (36 acres), Conscience Point (60 acres), Elizabeth A. Morton (187 acres), Oyster Bay (3,204 acres), Seatuck (209 acres), Target Rock (80 acres), Wertheim (2,572 acres), Sayville (26 acres), and Lido Beach (22 acres). There are currently five Federally-listed species (endangered [E], threatened [T], candidate [C]) and three identified species of concern within the focal area. Located in the Atlantic Flyway, Bird Conservation Region 30 (New England/Mid-Atlantic Coast), and Partners in Flight Physiographic Area 9 (Southern New England), the LIFA provides stopover, breeding, and wintering habitat for migrating bird species including piping plover (T), roseate tern (E), and red knot (C). Additionally, coastal saltmarshes provide breeding habitat for the saltmarsh sharp-tailed sparrow. Beach and dune habitats are used extensively by bird species for nesting; however, they are also necessary habitat for the reproduction of seabeach amaranth (T). Nearshore and offshore waters are important feeding and breeding grounds for a variety of important fish stocks including the historically overfished winter flounder. Upland habitats associated with sandplains and pine barrens also contain unique habitats that support species of concern including sandplain gerardia (E) and tiger salamander.

The Long Island and New York Field Offices actively seek to promote the above resources by addressing issues related to interactions with recreation, fishing, beach nourishment, navigation, transportation, wind power, and development. Specific threats include habitat loss, land conversion, shoreline hardening/development and dredging, overharvesting, invasive species, decreased habitat complexity, altered disturbance cycles, degraded water quality, and climate change. Current projects include the Fire Island Inlet to Montauk Point Beach Erosion Control

and Hurricane Protection Project (FIMP), Federal and non-federal permit review for U.S. Army Corps of Engineers projects and wind power development, and endangered species consultation and recovery activities.

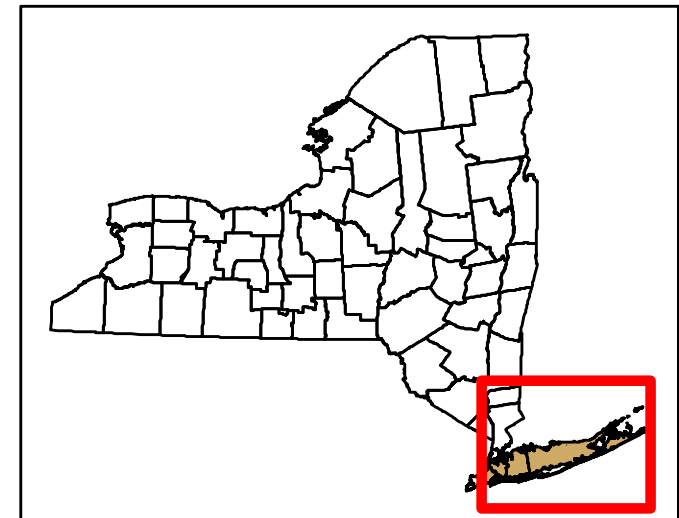
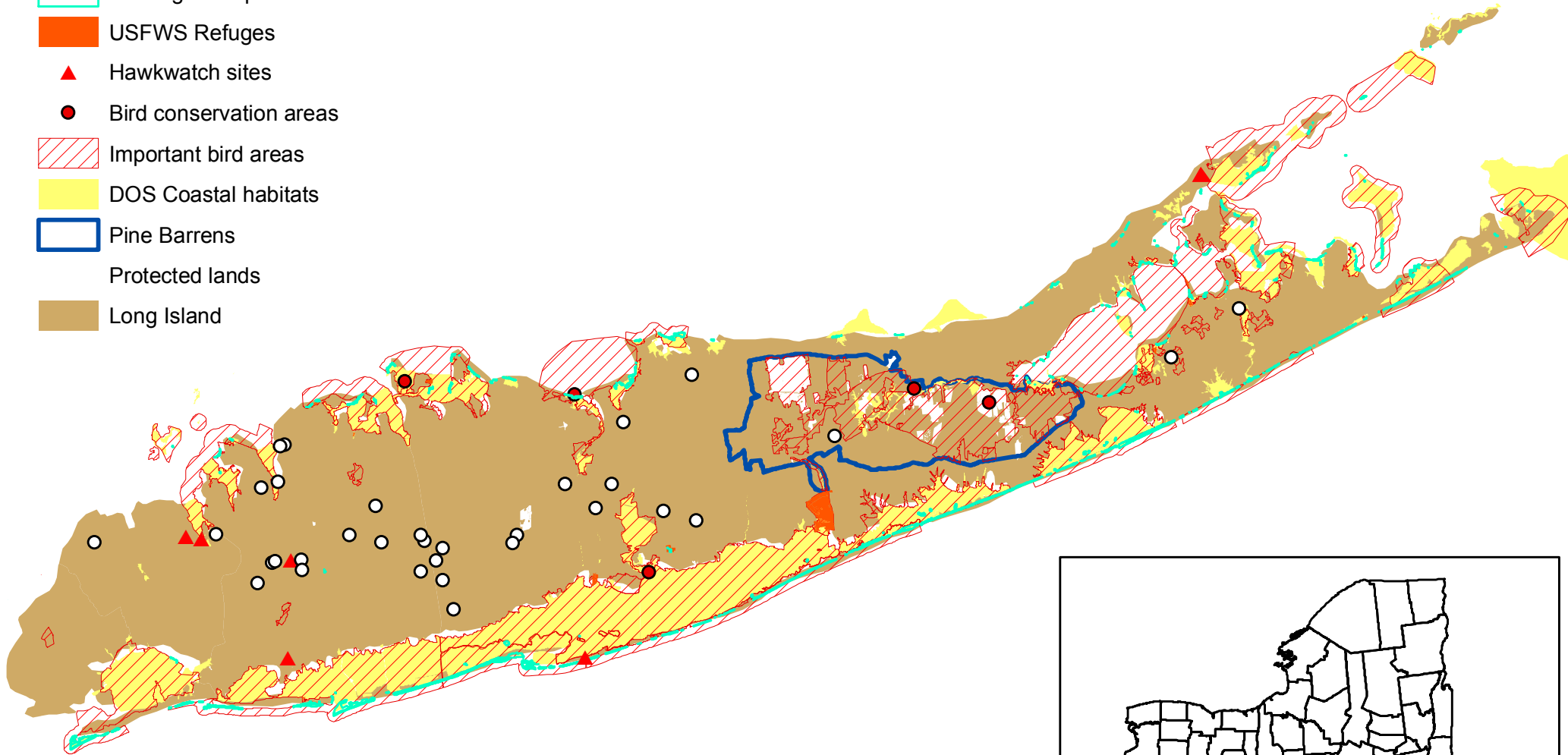
# Long Island Focal Area

0 5 10 20 Miles



## Legend

-  Endangered species
-  USFWS Refuges
-  Hawkwatch sites
-  Bird conservation areas
-  Important bird areas
-  DOS Coastal habitats
-  Pine Barrens
-  Protected lands
-  Long Island



# Piping Plover (*Charadrius melodus*): Long Island Focal Area

## Piping Plover Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

American oystercatcher, black skimmer, sanderling, gull-billed tern, red knot, least tern, common tern

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Atlantic coast piping plovers breed on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. After they establish nesting territories and conduct courtship rituals beginning in late March or early April, pairs form shallow depressions - nests - in the sand on the high beach close to the dunes. They sometimes line nests with small stones or fragments of shell. Piping plovers typically lay four eggs that hatch in about 25 days. The downy chicks are soon able to follow their parents in foraging for the marine worms, crustaceans, and insects that they pluck from the sand and eat.

Both the eggs and piping plover chicks blend into the beach so thoroughly that they are almost impossible to see. When predators or intruders come close, the chicks squat motionless on the sand while the parents attempt to attract the attention of the intruders, often by feigning a broken wing. Surviving chicks are able to fly in about 30 days.

Storm tides, predators, or intruding humans sometimes disrupt nests before the eggs hatch. When this happens, the plovers often lay another clutch of eggs. Chicks hatched from these late-nesting efforts may not fly until late August.

Piping plovers often gather in groups on undisturbed beaches before their southward migration. By mid-September, both adult and young plovers have departed for their wintering areas. These birds winter on the Atlantic coast from North Carolina south to Florida, along the Gulf coast, and in the Bahamas and West Indies.

**Justification for species selection:** The Atlantic coast piping plover is a Federally-listed threatened species (listing date 1986) and a New York State-listed endangered species. Within New York State, all occurrences of this species occur on Long Island, within the New York City boroughs, and occasionally in Westchester County. Within this geographical area, there are typically between 65 and 75 sites that support breeding piping plovers.

Piping plover nests are situated above the high tide line on coastal beaches, sandflats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and washover areas cut into or between dunes. They may also nest on areas where suitable dredged material has been deposited. Nest sites are shallow scraped depressions in substrates ranging from fine grained sand to mixtures of sand and pebbles, shells, or cobble (Bent 1929,

## Piping Plover (*Charadrius melodus*): Long Island Focal Area

Burger 1987, Cairns 1982, Patterson 1988, Flemming *et al.* 1990, MacIvor 1990, Strauss 1990). Nests are usually found in areas with little or no vegetation, although on occasion, piping plovers will nest under stands of American beachgrass (*Ammophila breviligulata*) or other vegetation (Patterson 1988).

A number of anthropogenic factors affect the piping plover and their habitat on Long Island, including large scale fireworks events, un-regulated off-road vehicle (ORV) driving, and pedestrians spurred by residential and public land development projects. Further habitat modification and destruction caused by beach nourishment, and other shoreline and channel stabilization projects, can also adversely affect piping plover habitat.

Because threats to Atlantic coast piping plovers persist (and in many cases have increased since listing), reversal of gains in abundance and productivity would quickly ensue from diminishment of current protection efforts. Insufficiently reliable funding to support annual protection efforts poses a current threat. Considerable additional progress is required to accomplish recovery criterion 4 [of the recovery plan] - institution of long-term agreements among cooperating agencies, landowners, and conservation organizations to ensure sufficient protection and management to maintain population targets and average productivity in all recovery units (USFWS 2010).

Apart from being a major focus of the Long Island Field Office (LIFO) Endangered Species Recovery Program over the years, at the State level it has recently been identified as a “Species of Greatest Conservation Need” and recommendations to assist in its recovery are given in the New York State Department of Environmental Conservation’s (NYSDEC) New York State Comprehensive Wildlife Conservation Strategy (see [http://www.dec.ny.gov/docs/wildlife\\_pdf/lowerhudson.txt.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/lowerhudson.txt.pdf)). The piping plover is also on the National Audubon Society’s Red Watchlist, being identified as a species of “Highest Continental Concern.” Audubon New York has stepped up its efforts on Long Island, recently installing a Bird Conservation Coordinator to focus on increasing the involvement of members of local Audubon Chapters in recovering this species.

**State contribution to overall species population:** The latest population data for 2008 showed New York contributing 443 pairs of piping plovers to the New York/New Jersey Recovery Unit. This equates to 79% of the population of this recovery unit and 23% of the Atlantic coast total.

### Threats and threat assessment:

Threats<sup>13</sup> (See 2009 5-year review for full assessment):

#### Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

- A. Shoreline development and stabilization; and, subsequent vegetation encroachment, long and short term shoreline erosion related to human attempts at shoreline stabilization, breach responses, preclusion of overwash/early successional habitat formation.

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<sup>13</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# Piping Plover (*Charadrius melodus*): Long Island Focal Area

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
NA

**Factor C. Disease or predation:**

- A. Mammalian and avian predators – human influenced changes to predator efficiency, and habitat (e.g. increases in feral cat populations, perching structures for avian predators, trash attracting mammalian predators to the nesting area).

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. The Endangered Species Act (ESA) does not provide land use regulation tools that are needed for long term maintenance of habitat and long term protection of species breeding, foraging, and loafing habitat.
- B. Disturbance by humans and pets, feral cats, unregulated or poorly regulated recreational activities including ORVs, kite flying, fireworks, chronic disturbances, and beach lighting.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Sea level rise – potential loss of nesting habitat
- B. Wind projects – potential direct mortality from the structures
- C. Climate change – potential changes in prey availability and success of nesting
- D. Small population size/genetic diversity

## ***Recovery Goals***

### ***Range-wide Recovery Goals/Objectives:***

Increase and maintain for 5 years a total of 2,000 breeding pairs, distributed among four recovery units as follows: Atlantic Canada, 400 pairs; New England, 625 pairs; **New York-New Jersey, 575 pairs;** Southern (DE-MD-VA-NC),400 pairs.

Achieve 5-year average productivity of 1.5 fledged chicks per pair in each of the four recovery units described in criterion 1, based on data from sites that collectively support at least 90% of the recovery units. As explained in the 1996 revised recovery plan and 5 year review document, modified productivity criteria that are specific to recovery units (rather than the "one-size-fits-all" measure of 1.5 chicks fledged per pair) should be developed in response to anticipated new information about the latitudinal variation in productivity needed to maintain a stationary population.

Institute long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit.

# Piping Plover (*Charadrius melodus*): Long Island Focal Area

## *Conservation goal(s) for New York State:*

Working with New Jersey Field Office (NJFO), NYSDEC, and Federal, State, and local cooperators achieve Piping Plover Recovery Plan goal of 575 pairs in New York-New Jersey Recovery Unit.

Achieve and maintain between 450 and 475 breeding pairs over the next 5 years.

Achieve and maintain productivity goal of 1.5 chicks fledged per pair over next 5 years.

## **Research/Actions needed:**

- Identify sites most likely to maintain (or increase) characteristics of suitable piping plover breeding and/or migration habitat. Identify human coastal stabilization practices that increase or decrease adverse effects of sea-level rise on coastal piping plover habitats.

(Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the Landscape Conservation Cooperatives [LCC] through Fish and Wildlife Information Needs System [FWINS]; Cost: TBD)

- Conduct studies to understand potential effects of wind turbine generators that may be located or proposed for the Outer Continental Shelf, nearshore, and within or between nesting and foraging habitats. Information needs include migration routes and altitude; flight patterns associated with breeding adults and post-fledged young of the year foraging at nearby sites that are not contiguous with nesting habitats; and, avoidance rates under varying weather conditions.

(Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

- Conduct studies, including meta-analyses of local studies, to understand factors that affect latitudinal variation in productivity needed to maintain stationary populations of Atlantic coast piping plovers.

(Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

- Conduct studies of ecology and foraging behavior of key predators; for example, studies assessing the adequacy of buffers between feral cat colonies and piping plover nesting sites would be useful.

(Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

## Piping Plover (*Charadrius melodus*): Long Island Focal Area

- Conduct demographic modeling to explore effects of latitudinal variation in productivity, survival rates, and the carrying capacity of habitat on population viability within individual recovery units and the Atlantic coast population as a whole.

(Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan 1996 (Service 1996) [http://ecos.fws.gov/docs/recovery\\_plan/960502.pdf](http://ecos.fws.gov/docs/recovery_plan/960502.pdf)
- 5-year review completed September 2009  
([http://www.fws.gov/northeast/endangered/PDF/Piping\\_Plover\\_five\\_year\\_review\\_and\\_summary.pdf](http://www.fws.gov/northeast/endangered/PDF/Piping_Plover_five_year_review_and_summary.pdf))
- Spotlight Species Action Plan 2009  
<http://www.fws.gov/northeast/endangered/pdf/Piping%20plover%20SSAP.pdf>  
The Atlantic coast Breeding Range spotlight action plan provides a goal that in 5 years the status of the Atlantic coast population has been maintained or improved. Three measures are identified to achieve that goal:
  1. Reduced or stabilized threat from effects of sea level rise.
    - a. Develop a strategy to address this.
    - b. Work with land managers to incorporate explicit measures to preserve resilience of habitat into at least one pilot management plan for an important breeding site.
  2. Increased abundance of the population, and for New York Field Office, recouping and maintaining the New York/New Jersey recovery until target of greater than 575 pairs reached only once.
    - a. Continue vigorous implementation of recovery plan tasks 1.1 through 1.5.
    - b. Work with U.S. Department of Agriculture (USDA) Animal Wildlife Services to develop targeted predator management plans where predation is a major factor limiting productivity.
  3. Demonstrating progress towards achieving recovery criterion 4 which is establishment of long term agreements for protection and management of habitat.



## Piping Plover (*Charadrius melodus*): Long Island Focal Area

- a. Complete at least one prototype agreement to ensure long term protection of plovers and their habitat, responding to listing factors A, C, D, and E, recovery task 1.62, and 5-year review number 3.
- Atlantic Coast Population website: <http://www.fws.gov/northeast/pipingplover/>
  - Bird Conservation Plan for the New England/Mid Atlantic Coast Bird Conservation Region (BCR 30) ( <http://www.nabci-us.org/bcr30.htm>)

### Research needed:

- Develop a state-by-state wintering and migration habitat use atlas (Recovery Actions 2.12, 2.13, 2.16).

(WHO: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS) (cost TBD)

- Conduct studies to understand potential effects of wind turbine generators that may be located or proposed for the coast, nearshore, and within or between nesting or foraging habitats. Information needs include migration routes and altitude, flight patterns associated with breeding adults and post-fledged young of the year foraging at nearby sites that are not contiguous with nesting habitats, and avoidance rates under varying weather conditions.

(WHO: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS) (Cost: TBD)

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range by:**

- A. Incorporating protection of breeding areas into land use plans and existing permitting processes (Recovery Action 1.341).
  1. Provide technical assistance on appropriate conservation measures e.g. time-of-year restrictions to avoid and minimize adverse effects relative to U.S. Army Corps of Engineers (USACE) and U.S. Coast Guard permit, planning and operations decisions (LIFO).

**Factors A, C, and D by identifying and securing reliable funding to support continuing management of threats from human disturbance and predation (Recovery Plan Tasks 1.1, 1.3, and 1.4).**

## Piping Plover (*Charadrius melodus*): Long Island Focal Area

- A. Implement monitoring and management of piping plovers at select sites such as Sand City, Crab Meadow Beach, Breezy Point, West Hampton, Plum Island, Fishers Island, Centre Island, and Silver Point, between April 1 and September 1. Depending on availability and need, assist Long Island's east end towns with monitoring and management. This effort also includes cross-programmatic efforts with Long Island National Wildlife Refuge Complex (LINWRC) and USFWS-Law Enforcement (LE), coordination with cooperators, providing technical assistance, funding and supplies, and when available, outside funding from the USACE to hire a plover monitor for the Federal Fire Island Inlet Navigation Project Area (LIFO).
- B. Survey Cedar Beach Mount Sinai and other key breeding sites (to be listed) within each sub-basin for feral cats. Coordinate with cooperators to assess predator issues at breeding sites and develop action plans as necessary.
  1. Assess feasibility of a plan regarding feral cats on Cedar Beach Mount Sinai and other breeding sites within the Town of Brookhaven. Continue to participate in national teleconferences to develop USFWS guidance on feral cats. On Long Island, obtain and gather information on feral cat colony locations; do outreach to local government to advise them about removal of colonies (LIFO).
- C. Coordinate with USDA – Animal Wildlife Services on Long Island-wide predator management program, a subpart of the overall Northeast Corridor Plan.
  1. Provide input for Long Island.
  2. Complete any intraservice consultations on removal of predators in breeding habitat (LIFO).
- D. Provide cooperators piping plover equipment such as signs, predator exclosures, fencing, and string for identified priority sites (as funding allows) (LIFO).
- E. Hold steward training sessions.
  1. Hold two steward training sessions for incoming stewards and land managers (LIFO).
  2. Work with USFWS-LE to assess need for special training for USFWS-LE agents from cooperating land managers (LIFO).
- F. Conduct Long Island Colonial Waterbird and Piping Plover Surveys at Sand City, Centre Island, Tobay Marsh Islands, Silver Point, Crab Meadow Beach, Breezy Point, Fishers Island, and Plum Island. Assess piping plover use of mainland upland sand dredging disposal sites located at Roe and Grove Avenue in Patchogue by conducting periodic surveys (LIFO).
- G. Work with NYSDEC and National Park Service (NPS) to organize and implement annual End of Season cooperators meeting to assess season results and recognize stewards.

## Piping Plover (*Charadrius melodus*): Long Island Focal Area

- H. Continue to promote the restoration and maintenance of natural coastal formation processes in the New York-New Jersey recovery unit (specifically, Long Island) where threats from development and artificial shoreline stabilization are highest, and in the Southern recovery unit, where the plover's habitat requirements are the most stringent (recovery task 1.2). This action is also critical to reducing adverse effects of accelerating sea-level rise. Where possible, reestablish high quality intertidal forage habitats by promoting, with land use regulators, the natural formation of overwash fans and other like formations. Where possible, work with landowners to develop plans to reestablish high quality foraging habitats by either manufacturing sandflats, mudflats, or overwash fans, or allowing such formations to build naturally. Also, ephemeral pool creation adjacent to beach nesting habitat will be pursued in these plans.
- I. On a case by case basis, assess impacts of USACE and local government projects on coastal processes through Section 7 consultation and Section 10 permit review (LIFO).
- J. Meet with Fire Island National Seashore Natural Resource Management to review results of 2010, and plan for 2011, threatened and endangered species monitoring and protection efforts within the Seashore.
- K. As follow up to existing Section 7 consultations with the NPS and Suffolk County Department of Parks, Recreation and Conservation, determine compliance with project commitments to undertake habitat restoration at Cupsogue County Park and Smith Point County Park (LIFO).
- L. Work with New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) on a conservation strategy to address long term conflicts between recreational uses of barrier beaches and listed species habitat protection and avoidance of adverse effects/take (all LIFO).
  - 1. Meet with NYSOPRHP to discuss loss of two chicks when ORV traffic impinged on natural movements of adults and hatched chicks in pre-fledged condition.
  - 2. Meet with Regional Office (RO) and other Habitat Conservation Plan (HCP) experts to draft a strategy for assisting the State in developing an HCP and Section 10 permit.
  - 3. Convene a workshop with NYSDEC and NYSOPRHP to explain HCP process and develop a timeline for the State to apply for a Section 6 HCP writing grant, if interested; for developing the parts of the HCP and to show significant progress towards its completion before plover breeding season 2011. Key issues to iron out include: covered species, covered activities, covered lands, permit duration, and discuss impacts/effects, take and the impacts of the take. Set biological goals and objectives and development of a conservation strategy, including explicit measures for avoidance, minimization and mitigation; address monitoring and adaptive management measures. Fully discuss alternatives to take.

## **Piping Plover (*Charadrius melodus*): Long Island Focal Area**

- M. As needed, work with Valley Stream office of USFWS-LE to investigation alleged endangered species take incidents. Develop a work plan for a seasonal intern to undertake piping plover monitoring at Southampton and Huntington, New York, in support of USFWS-LE activities (contingent on funding) (LIFO).
- N. As requested, undertake Section 7 consultation with the Federal Emergency Management Agency (FEMA) for emergency disaster declaration projects (LIFO).
- O. Address oystercatcher predation pressure on plovers.
  - 1. Develop a scope of work to investigate the scope of the problem.
  - 2. Develop a research proposal to ascertain pressures causing this problem, including competition for breeding areas or for forage.
- P. Continue to lead ESA efforts on review of General Services Administration's Draft Environmental Impact Statement regarding the proposed disposition of Plum Island Animal Research Lab (LIFO).

### **Address Factor E. Other natural or manmade factors affecting its continued existence:**

Nothing planned this year.

#### *Partners*

NYSDEC Regions 1 and 2, New York State Parks, TNC, Audubon, Nassau and Suffolk Counties, Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, Oyster Bay, City of Long Beach, City of Glen Cove, Queens County, Kings County, Fire Island National Seashore.

### **OUTREACH**

Participate in two outreach events to promote listed species conservation on Long Island.

### **MONITORING**

Continue to review and track recovery progress.

Conduct Long Island Colonial Waterbird and Piping Plover Surveys at Sand City, Centre Island, Tobay Marsh Islands, Silver Point, West Hampton Dunes, Breezy Point, Fishers Island, and Plum Island.

Conduct weekly monitoring and management at Breezy Point, Sand City, and Plum Island. Monitor Cedar Beach Mount Sinai, Village of Westhampton Dunes, beaches within the Towns of Easthampton, Southampton, and Huntington, and Silver Point, as needed.

## **Piping Plover (*Charadrius melodus*): Long Island Focal Area**

Supervise and assist volunteer piping plover monitors at Half Moon Beach, Crab Meadow Beach, and Prospect Point.

Secure funding for monitoring and management of listed species at Fire Island Navigation Project Area. Oversee subcontractor efforts.

### *Partners*

New York State Natural Heritage Program, NYSDEC, The Nature Conservancy, Audubon Society

### *References*

U.S. Fish and Wildlife Service. 1996 Recovery plan for the Atlantic coast piping plover (*Charadrius melodus*) Hadley, MA. [http://ecos.fws.gov/docs/recovery\\_plan/960502.pdf](http://ecos.fws.gov/docs/recovery_plan/960502.pdf)

U.S. Fish and Wildlife Service. 2007. Final Draft Bird Conservation Plan for the Mid Atlantic Coast Bird Conservation Region (BCR 30) (<http://www.nabci-us.org/bcr30.htm>)

U.S. Fish and Wildlife Service. 2009a. Piping Plover 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Northeast Region, Hadley, Massachusetts. ([http://www.fws.gov/northeast/endangered/PDF/Piping\\_Plover\\_five\\_year\\_review\\_and\\_summary.pdf](http://www.fws.gov/northeast/endangered/PDF/Piping_Plover_five_year_review_and_summary.pdf))

U.S. Fish and Wildlife Service. 2009b. Draft Spotlight Species Action Plan for the Atlantic Coast Population of the Piping Plover (*Charadrius melodus*). Northeast Regional Office, U.S. Fish and Wildlife Service, Hadley, MA. <http://www.fws.gov/northeast/endangered/pdf/Piping%20plover%20SSAP.pdf>

# Red Knot (*Calidris canutus rufa*): Long Island Focal Area

## Red Knot Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

sanderling, black-bellied plover, dunlin, ruddy turnstone, sandpiper spp.

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The red knot (*Calidris canutus*) is a worldwide species with a total population of approximately 1.05 million (Wetlands International 2006, Minton unpublished data, this review). There are six subspecies of the red knot which together have a circumpolar arctic breeding distribution, though each breeds in a distinct area and winter separately. This species action plan focuses on the New World red knot subspecies *Calidris canutus rufa*.

Essentially, the plumage of all red knots is mainly chestnut-red or salmon-colored during the breeding season and white and gray for the remainder of the year. The differences between the subspecies are largely confined to breeding plumage and size. Pair bonds form soon after arrival on breeding grounds and remain intact until shortly after the eggs hatch (Niles et al. unpublished data) when the females leave their broods. Nests are cup-shaped depressions, often with well-defined rims, lined with dried leaves, grasses, and sometimes lichens. Red knots lay only one clutch per season and as far as is known, do not lay a replacement clutch if the first is lost. The usual clutch size is 4 eggs, though 3-egg clutches have been recorded. The incubation period lasts approximately 22 days from the last egg laid to the last egg hatched. Both sexes participate equally in egg incubation. Hatching occurs within the first half of July and is generally synchronized. Hatching within clutches is apparently quite synchronous, occurring within the same day. The fledgling period is estimated to be 18 days. Soon after the chicks hatch in mid-July, the females leave the breeding grounds and start moving south. Males look after the chicks until they fledge at about 25 days when they too abandon them and move south. Not long after, they are followed by the juveniles, which start to appear along the northeast coast of the U.S. in the second half of August. Throughout the flyway, the adults generally precede the juveniles as they move south from stopover to stopover.

**Justification for species selection:** The red knot is a candidate species for listing under the Endangered Species Act of 1973. It is found at shorebird migratory stopover sites on Long Island during the summer.

**State contribution to overall species population:** The numbers of red knots who use Long Island as a migratory stopover are based on limited casual observations of the species during the migration period.

#### **Threats and threat assessment:**

# Red Knot (*Calidris canutus rufa*): Long Island Focal Area

## 1. Reduction in foraging resources

The main identified threat to the rufa population is the reduced availability of horseshoe crab eggs in Delaware Bay, arising from elevated harvest of adult crabs for bait in the conch and eel fishing industries. Since 1990, there has been a substantial decline in the crab population. Although significant uncertainty regarding the extent of the decline of the horseshoe crab population remains, there is general agreement that horseshoe crab stocks have declined to a level where increased management of the fishery is necessary and appropriate. The decline in crabs has led to a decrease in the density of eggs available to shorebirds. Because of their delayed maturity, demographic models indicate that even if further exploitation of crabs ceases immediately, it will be some years before the horseshoe crab population recovers to its former level.

The greatest risk of the declining availability of horseshoe crab eggs in Delaware Bay to red knots is that it jeopardizes their ability to achieve the mass required to reach the Arctic and attain good breeding condition.

### Research needed:

- How many crab eggs are enough? Integration of horseshoe crab egg data and shorebird behavior into a model that can predict the numbers of eggs needed by shorebirds. From this an estimate of the density of eggs required to support present and future numbers of shorebirds can be calculated.
- Modeling food availability to red knots in Delaware Bay will need bay-wide egg data and an understanding of the conditions under which the egg supply in the top 5 cm of sand (and, therefore, potentially available to knots) increases and decreases.
- Studies that determine the level of harvest that will ensure enough eggs for migratory shorebirds are essential.

(Who: U.S. Fish and Wildlife Service [USFWS] via species coordinator; Costs: unknown at this time)

## 2. Decreased habitat availability from beach erosion and shoreline stabilization

Delaware Bay's sandy barrier beaches are dynamic features that respond in a generally predictable manner, migrating landward by storm overwash as the bayward shoreline is also retreating landward in the face of continued sea level rise (Phillips 1986a).

### Research needed:

- Evaluate threat to species as a result of decreased habitat availability due to beach erosion and shoreline stabilization.

(Who: USFWS via species coordinator; Costs: unknown at this time)

## Red Knot (*Calidris canutus rufa*): Long Island Focal Area

### 3. Curtailment of habitat use from disturbance by people and dogs

Human disturbance can have an adverse effect on shorebird foraging and this depends on the degree of disturbance and the availability of other suitable feeding areas. Disturbance compels birds to pay the energetic cost of flying to a new area; it may reduce the amount of time that the birds are able to feed, and can prevent them from feeding in the most preferred sites. Any overall reduction in energy intake as a result of these responses is the net impact of disturbance on energy budgets (Davidson and Rothwell 1993).

#### Research needed:

- Effects of disturbance mechanisms on red knot.

(Who: USFWS via species coordinator: Costs: unknown at this time)

### 4. Competition from gulls

Gulls are both competitors for food and potential predators of shorebirds. They take advantage of abundant horseshoe crab eggs, particularly on that part of the New Jersey bayshore that lies close to their Atlantic coast breeding colonies.

#### Research needed:

- Effects of gull competition on foraging resources and harassment of red knot.

(Who: USFWS via species coordinator: Costs: unknown at this time)

### 5. Risks associated with small population size

The threat to *rufa* may become further increased if the population drops below about 10,000 because Baker *et al.* (2005a) has shown that, due to their low genetic variability, the effective size of shorebird populations is much smaller than numbers censused (i.e., not all individuals contribute to the gene pool). As a result, census populations of 5,000 - 10,000 are likely to be especially vulnerable to the accumulation of harmful genetic mutations. Small populations are also at greater risk from the effects of stochastic events. This applies especially to those which, like the red knot, are highly dependent on a small number of sites.

#### Research needed:

- Modelling analysis of risks associated with small population size.

(Who: USFWS via species coordinator: Costs: unknown at this time)

### 6. Weather-related threats to red knots



## Red Knot (*Calidris canutus rufa*): Long Island Focal Area

Cold and/or wet weather during the brief arctic summer can have a severely adverse effect on the breeding success of shorebirds (van de Kam et al. 2004). Global climate warming may lead to alterations in arctic weather patterns. These may be beneficial to shorebirds if they lead to warmer, longer breeding seasons, but this is by no means certain (Rehfishch and Crick 2003).

In the very long term, global warming may lead to large-scale habitat changes which will greatly exacerbate the vegetation responses to increased atmospheric carbon dioxide (Rehfishch and Crick 2003).

### **Research needed:**

- Modelling analysis of risks associated with weather-related threats on red knot populations.

(Who: USFWS via species coordinator: Costs: unknown at this time)

## **7. Inadequacies of the Federal and regional regulatory system**

The existing regulatory system creates a number of problems for the conservation of red knots stopping over in Delaware Bay in that different agencies have jurisdiction over the protection of horseshoe crabs (and their eggs) on the one hand, and red knots on the other. The birds are under the legal jurisdiction of the USFWS, and the horseshoe crabs are under the legal jurisdiction of the Atlantic States Marine Fisheries Commission (ASMFC) which has the authority to set quotas for adoption by the states. The ASMFC is overseen by the National Marine Fisheries Service (NMFS) which has ultimate responsibility for the management and conservation of living marine resources.

### **Research needed:**

- Analysis of most effective regulatory mechanisms to help recover red knots.

(Who: USFWS via species coordinator: Costs: unknown at this time)

## **8. Inadequacies of regulatory systems in individual states**

Without adequate Federal coordination, the attempts of individual states to conserve red knots have lacked consistency. This has led to substantial gaps in protection, especially when horseshoe crab fishermen have exploited differences in regulations among states.

### **Research needed:**

- Analysis of most effective regulatory mechanisms to help recover red knots.

(Who: USFWS via species coordinator: Costs: unknown at this time)

# Red Knot (*Calidris canutus rufa*): Long Island Focal Area

## 9. Disease or predation

Potential predators of shorebirds, especially peregrines, red foxes (*Vulpes vulpes*), and feral cats (*Felis catus*), are possibly more of a threat to knots in Delaware Bay as sources of disturbance than as agents of mortality. An epizootic disease resulting in large-scale mortality of knots reported from the west coast of Florida in December 1973 and November 1974 was caused by a protozoan parasite, most likely an undescribed sporozoan species (Harrington 2001). Further reports on knot mortality in Florida in 1981 were due to *Plasmodium hermani* (Harrington 2001). In 1981 there was a report of an adventitious molt in red knots caused by a mallophagan parasite (Mallophaga: Menoponidae) in feather shafts (Harrington 2001). No systematic effort has yet been made to assess the parasite load of birds passing through Delaware Bay, but field workers have noticed ectoparasites on a substantial number of knots caught there (Minton and Niles unpublished information). This is a factor worthy of further investigation.

### Research needed:

- Analysis of disease pathways and predation on red knots

(Who: USFWS via species coordinator: Costs: unknown at this time)

### *Partners/potential funding:*

Partners: National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC) Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### 1. Reduction in foraging resources and decreased habitat availability from beach erosion and shoreline stabilization

- a. Seek to minimize loss of horseshoe crab habitat by influencing regulatory agency decisions regarding shoreline modifications including bulkheading; and, “unnatural” erosion mitigation practices, dredging, and placement of fill along bay shorelines.
- b. Target USFWS habitat restoration and enhancement projects to horseshoe crab habitat including adding enhancements to shoreline beach nourishment projects; promoting habitat restoration projects; and, provide technical assistance on restoration projects.
- c. Facilitate habitat preservation through coordination with Federal, State, and local government agencies as well as private organizations such as land trusts.

## **Red Knot (*Calidris canutus rufa*): Long Island Focal Area**

- d. Preserve, restore, and/or enhance shorelines known to support horseshoe crabs.
- e. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

### **2. Curtailment of habitat use from disturbance by people and dogs**

- a. Coordinate with land managers to evaluate land use measures to reduce disturbances from humans and dogs.
- b. Develop outreach materials specific to this issue through the Beach Awareness and Habitat Campaign which is comprised of Federal, State, and local agencies and non-governmental organizations (NGO).

### **3. Competition from gulls**

- a. Collect data on gull absence/presence at horseshoe crab spawning sites.

### **4. Risks associated with small population size**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### **5. Weather-related threats to red knots**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### **6. Inadequacies of the Federal and regional regulatory system**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### **7. Inadequacies of regulatory systems in individual states**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### **8. Disease or predation**

## Red Knot (*Calidris canutus rufa*): Long Island Focal Area

- a. Record dead red knot specimens; identify sources of predation at key migratory stopover areas.

*Partners/potential funding:*

*Partners*

NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Reduction in foraging resources and decreased habitat availability from beach erosion and shoreline stabilization**
  - a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding shoreline modifications, including bulkheading and “unnatural” erosion mitigation practices, dredging, and placement of fill along bay shorelines and wetlands.
    - i. Developing Fact Sheets and best management practices (BMP) to minimize impacts to red knot from a suite of different construction activities.
    - ii. Post these Fact Sheets/BMP on our website.
    - iii. Writing substantive comments on proposed Federal agency actions with likely adverse impacts on red knot (Conservation Planning Assistance [CPA]).
  - b. Target USFWS habitat restoration and enhancement projects for red knot, including adding enhancements to shoreline protection design projects; promoting habitat restoration projects; and, provide technical assistance on beach nourishment and restoration projects.
    - i. Incorporate Fire Island to Montauk Point Restoration proposals into horseshoe crab habitat enhancement planning.
  - c. Facilitate habitat preservation through coordination with Federal, State, and local government agencies as well as private organizations such as land trusts.
    - i. Coordination with Peconic Land Trust and other organizations to protect important horseshoe crab spawning sites and red knot foraging areas.
  - d. Preserve, restore, and/or enhance shorelines known to support horseshoe crabs and red knots.

## Red Knot (*Calidris canutus rufa*): Long Island Focal Area

- i. Coordinate with Federal, State, and local agencies as well as NGOs on methods to preserve, restore, or enhance red knot habitat.
  - e. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
    - i. [Coordinate with Federal, State, and local regulatory and land use agencies on measures that could minimize impacts to horseshoe crab and red knot habitat, including the Plumb Beach Shoreline Protection Project \(LIFO\).](#)
2. **Curtailment of habitat use from disturbance by people and dogs**
  - a. Coordinate with land managers to evaluate land use measures to reduce disturbances from humans and dogs.
  - b. Develop outreach materials specific to this issue through the Beach Awareness and Habitat Campaign which is comprised of Federal, State, and local agencies and NGOs.
3. **Competition from gulls**
  - a. Collect data on gull absence/presence at horseshoe crab spawning sites.

### 4. **Risks associated with Small population size**

Please go to these documents for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### 5. **Weather-related threats to red knots**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### 6. **Inadequacies of the Federal and regional regulatory system**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

### 7. **Inadequacies of regulatory systems in individual states**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

# Red Knot (*Calidris canutus rufa*): Long Island Focal Area

## 8. Disease or predation

- a. Record dead red knot specimens; work to reduce feral cat and red fox populations near known migratory stopover areas.

*Partners/potential funding:*

Partners: NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

## OUTREACH

### Potential outreach needs:

- Landowner education
- Public outreach

*Partners/potential funding:*

Partners: NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

## MONITORING

- Work with NYSDEC to monitor red knot at migratory stopover areas such as West Hampton Dunes, Southampton, and Jamaica Bay.
- Evaluate habitat restoration projects and resulting effects on red knot habitat use and abundance during migration.
- Seek funding and support for monitoring.

*Partners/potential funding:*

Partners: NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

### Other Research needed as identified in USFWS (2007):

- How do birds from different wintering populations use Delaware Bay?
- Why has there been a trend for northward migration to become later?

## Red Knot (*Calidris canutus rufa*): Long Island Focal Area

- About 20% of the red knots passing through Delaware Bay have isotope signatures not compatible with known molting areas – where do these birds molt?
- Why have there been declines in some wintering areas in southern South America and not others?
- Why have many southern South American wintering birds not passed through Delaware Bay in Spring?
- What is the extent of the roselaari and rufa wintering areas, do they both pass through Delaware Bay and where do they breed?
- Breeding productivity is a major unknown – monitoring it might help with understanding the impact of depleted food resources in Delaware Bay as well as allowing full demographic modeling.
- Virginia - Investigation of which prey red knots are targeting on the Virginia barrier islands, with specific attention paid to identifying the availability of prey on peat banks vs. on high energy beaches and the relative importance of each to migrating red knots.
- North Carolina - Research on impacts of beach stabilization and impacts of human disturbance.
- South Carolina - Develop a South Carolina Department of Natural Resources web site with information on the status, management, and natural history of red knots in South Carolina. Work with public and private land managers to protect areas identified as important red knot roost sites. Obtain travel money to participate in red knot working groups.
- Massachusetts - High priority needs for the State of Massachusetts include research and monitoring of human disturbance in shorebird habitats, particularly those disturbances associated with commercial and recreational fishing and public access to beaches.

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# Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

## Roseate Tern Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

common tern, least tern, red-throated loon, common eider, razorbill, scoter spp., long-tailed duck

### BIOLOGICAL PLANNING

#### *Introduction to species*

#### **Species information:**

**Justification for species selection:** Federally-listed (endangered) State Status. New York field Office (NYFO) national or regional lead?

**State contribution to overall species population:** Federally-listed endangered species, New York sustains approximately 50% of the Atlantic Coast population. Roseate terns have been fairly stable for the past 5 years, though the number of breeding locations has declined in recent years, with Great Gull Island and Fort Tyler (Gardiners Point Island) as the only stable breeding locations in all of New York.

#### **Threats and threat assessment:**

Threats<sup>14</sup> (See 5-year review for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Long- and short-term shoreline erosion
- B. Preclusion of overwash/early successional habitat
- C. Shoreline development and stabilization
- D. Sea level rise
- E. Storm-induced flooding

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** NA

#### **Factor C. Disease or predation:**

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<sup>14</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act



## **Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area**

- A. Mammalian and Avian Predators: Nest predation can be very high, particularly from fox, crow, and most recently, American oystercatchers. Predation of chicks by cat, gull, raccoon, fox, and crow limits productivity of successfully nesting birds.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Recreational Activities

### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Invasive vegetation
- B. Wind energy projects
- C. Sea level rise As sea level continues to rise and erosion of historical breeding islands continues, suitable nesting sites of both Common and Roseate terns are likely to decrease, exposing both species to a higher likelihood of drastic population declines as the few remaining breeding locations contain a higher proportion of the entire population.

### ***Recovery Goals:***

***Range-wide Recovery Goals/Objectives:*** To increase the nesting pairs (U.S. and Canada) to 5,000 breeding pairs at six large colonies. Secondly, to have roseate terns distributed to at least 30 sites, and expand breeding range to historically occupied areas south of current range. (Roseate Tern Recovery Plan [1989] and First Update [1998]).

### ***Conservation goal(s) for New York State:***

**Objective:** Working with Roseate Tern Recovery Team, New York State Department of Environmental Conservation (NYSDEC), and Federal, State, and local cooperators contribute to recovery of the northeastern roseate tern population. On Long Island, achieve and maintain between 1,600 and 1,800 breeding pairs over the next 5 years, and explore potential for expanding the number of colonies in the Long Island Sound and South Shore Ocean and Bays focal areas.

### **Research/Actions needed:**

Movement of bait fish – moving north are species changing or number declining and potential impact on the population.

Additional studies of roseate tern migratory movement along the Atlantic coast.

(WHO – recovery team coordinator Michael Amaral has the lead)

Continuing to fund American Museum of Natural History (AMNH) Great Gull monitoring and management of common tern and roseate tern colony at Great Gull – largest colony in New York State, sustaining and providing 98% of New York population (Long Island Field Office [LIFO]). Participate in roseate tern recovery meeting in Rhode Island end of November (LIFO).

# Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan
- Last 5-year review completed
  - Next 5-year review anticipated
- A number of goals and recommendations for this species have been identified by the NYSDEC in their Comprehensive Wildlife Conservation Strategy for the Lower Hudson – Long Island Basins focal area. ([http://www.dec.ny.gov/docs/wildlife\\_pdf/lowerhudson.txt.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/lowerhudson.txt.pdf)). Several of these are provided below:
- Roseate Tern Recovery Plan (1989) and First Update (1999)
- NYSDEC Long Island Colonial Waterbird and Piping Plover Survey Program (1998-1999)
- U.S. Fish and Wildlife Service (USFWS) Long Island Field Office Piping Plover Steward training and Law Enforcement Training Manuals
- West of Shinnecock Inlet Interim Storm Damage Protection Biological Opinion

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 -2012

### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Develop ideal nesting conditions on islands with less recreational use pressure, selective removal of predators, and be expanded to create new nesting opportunities for species. This will be accomplished through dredge spoil management, input into beach renourishment projects, and de-vegetation of formally suitable sites.
- B. Develop ideal nesting condition on barrier beaches.
  1. Provide technical assistance to Breezy Point Coop, and other sites as needed, for common, least, and roseate tern nesting habitat protection. (LIFO).

## Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

- C. Seek management and restoration opportunities that aim to restore natural shorelines in the basin.
- D. Support cooperative and coordinated interagency invasive species management and control. Also, control density and composition of vegetation at breeding sites to maintain suitability for nesting through planting of fresh spoil sites with desired species, and grading and/or spoil deposition at sites where vegetation has become too dense.
  - 1. Bay Islands (e.g. New Made Island, West Inlet) – essential to establish alternative populations as 98% of New York population is at Great Gull.
  - 2. Continue to support Town of Brookhaven project at New Made Island with installation and broadcasting breeding calls to attract roseate and common terns (LIFO).
  - 3. In cooperation with Long Island National Wildlife Refuge Complex (LINWRC), plan vegetation removal/maintenance at New Made Island. (LIFO).

### Factor B. Disease or predation:

- A. Control predators by encouraging landowners to open property during legal hunting and trapping seasons, as well as allowing trapping within the breeding season if predation levels are excessive.
- B. Address avian predators by ensuring proper disposal and pick up of garbage and litter to minimize likelihood that avian predators will be present.
  - 1. Monitor impacts from Oystercatchers sharing nesting areas with roseate terns (e.g. New Made Island). Convene meeting or provide information via Fact Sheet to webserve of American oystercatcher habitat managers.
  - 2. If needed, assist in funding predator control on Great Gull Island (LIFO).

### Factor C. The inadequacy of existing regulatory mechanisms:

- A. Address impacts of inadequate management of recreational activities by expanding and coordinating seasonal protection of beach and island ground nesting birds and transient shorebirds, including the tree species of terns. This should include fencing of key nesting areas and enhanced stewardship of nesting beaches.
  - 1. Establish symbolic pre-fencing at East Inlet Island.
  - 2. Monitor recreational use of bay islands which may disturb roseate tern nesting (e.g. Goose Island Flat).

## **Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area**

- B. Continue to oversee coordination with private and public landowners regarding implementation of roseate tern recovery activities on Long Island, with special emphasis on Great Gull Island, Fort Tyler, Cartwright Shoals, New Made Island, West Island, East Inlet Island, Sexton Island, and Goose Island Flat.

### **Factor D. Other natural or manmade factors affecting its continued existence:**

- A. Invasive vegetation

### **OUTREACH**

Educate the public on the impacts of domestic cats on birds and encourage landowners to keep their cats indoors.

### **MONITORING**

Review and track recovery progress.

# Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

## Saltmarsh Sharp-tailed Sparrow Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

Clapper rail, other rail species, glossy ibis, marsh wren, seaside sparrows

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The saltmarsh sharp-tailed sparrow is a secretive and highly localized species largely restricted as a breeding bird to wet meadows, edges of freshwater marshes, and saltmarshes in recently deglaciated regions of interior and Atlantic coastal North America (Greenlaw & Rising 1994). In the U.S., the saltmarsh sharp-tailed sparrow is limited in its breeding range from Maine south to the Delmarva Peninsula where its breeding habitat is typically restricted to saltmarshes. Its wintering range extends from New York to Florida. It is a ground nester whose breeding success is largely affected by the timing of nesting in relation to spring high tides and storms which would otherwise flood their nests. In New York, most nests are placed in medium-height cordgrass (*Spartina alterniflora*) growing just below mean high-tide level and in salt-meadow areas above mean high tide. During the breeding season its diet is almost exclusively animal matter (primarily adult and larval insects, spiders, and amphipods) supplemented by seeds of grasses, wild rice, and other herbaceous plants (Greenlaw & Rising 1994).

**Justification for species selection:** The saltmarsh sharp-tailed sparrow was chosen as a priority species because of its importance in the eastern U.S., as well as in New York. The saltmarsh sharp-tailed sparrow is listed as a Highest priority species in Bird Conservation Region (BCR) 30 (USFWS 2008). Due to this species' precarious population status, the National Audubon Society has included it on their species WatchList of "high conservation concern species." The species is also considered globally Vulnerable using IUCN Red List criteria (BirdLife International 2004). It is suggested that possibly half of the world's population of saltmarsh sharp-tailed sparrows occur in southern New England (Dettmers and Rosenberg 2000).

Coastal marsh and mature forested habitats are the highest priority habitats within the BCR due to development pressures, rate of loss, or lack of information on rate of loss and present spatial distribution (USFWS 2008). Saltmarsh sharp-tailed sparrows are at severe risk from climate change impacts such as sea level rise (<http://www.stateofthebirds.org>).

**State contribution to overall species population:** The saltmarsh sharp-tailed sparrow breeds along the northern and southern shores of Long Island. This concern is based on their limited range and specialized habitat use. Saltmarshes along the Atlantic Coast have suffered considerable habitat loss, fragmentation, and modification (Rozsa 1995, Zedler and Adam 2002), and the effects of these changes are exacerbated by reduced sparrow densities in smaller marshes

# Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

(Benoit and Askins 2002, Shriver et al. 2004). Continuing threats to these habitats include the spread of the invasive common reed (*Phragmites australis*), sea level rise, and coastal erosion (Zedler and Adam 2002). It is well documented that saltmarsh sharp-tailed sparrows breed primarily in high marsh habitats dominated by saltmeadow cordgrass (*Spartina patens*; Brawley et al. 1998, Benoit and Askins 1999, DiQuinzio et al. 2002, Shriver 2002, Shriver et al. 2004).

**Threats and threat assessment:** (from Atlantic Coast Joint Venture [ACJV] 2008)

- 1. Loss of habitat and habitat function.** Loss, degradation, and fragmentation of existing habitats are the most pressing threat to saltmarsh sparrows in BCR 30. Populations of most priority species are limited by factors related to the quantity, distribution, connectivity, and quality of habitats (including patch size) available to them during the breeding and non-breeding seasons and during migration. When wetlands, forests, or fields are converted for use as human housing, industry, intensive agriculture, or forestry, they often lose most of their value as bird habitat (i.e., they become unavailable to the vast majority of bird species). Further, the activities, noise, pets, vehicles, buildings, roads, power lines, and other characteristics of anthropogenic land uses often disrupt and decrease the quality of any potential habitats remaining, including lands nearby or adjacent to human developments. The isolation and lack of connectivity of remaining habitat patches (fragmentation) lowers their value to many species.

#### **Research needed:**

- Conduct research on food availability and food habits.
- Conduct research on niche separation between sympatric species.

- 2. Marsh management.** Due to unknown effects of mosquito control, marsh burning, open marsh water management, ditch plugging, etc., the ditching of saltmarshes for the purposes of controlling mosquitoes in proximity to residential developments has resulted in hydrologic changes to marshes throughout much of the range of the saltmarsh sharp-tailed sparrow. Changes in marsh hydrology can result in changes to plant communities, formation of habitat types (such as erosion of mud flats), and tidal amplitudes. Chemical control of mosquito in marsh areas requires application of compounds often by aircraft may affect species' biology and behaviors.

#### **Research needed:**

- Research is needed to determine the impacts of mosquito control and pesticides on sparrow populations resulting from food limitation and food habits.
- Research impacts of marsh management techniques on populations.

- 3. Possible point and non-point sources of mercury deposition.** Saltmarsh sharp-tailed sparrows are considered bioindicators for the presence of mercury in saltmarshes. Recent

## Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

research has detected elevated mercury levels in the blood of passerine species such as the saltmarsh sharp-tailed sparrow. Pathways for mercury contamination include bioaccumulation and direct exposure with contaminated sources such as sediments.

### **Research needed:**

- Research is needed to determine the extent of mercury contamination in saltmarsh sharp-tailed sparrow and other marsh bird populations through sampling of sparrow populations across its range.
4. **Climate change.** Seasonal climate changes could shift migration patterns of birds such as saltmarsh sharp-tailed sparrows and changes in food and habitat availability.

### **Research needed:**

- Research is needed to evaluate effects of climate change on this species.
- Research techniques to increase productivity and survival.

### *Partners/potential funding:*

New York State Department of Environmental Conservation (NYSDEC) Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

### *Population goal(s) for New York State:*

### *Population Goal for New York Field Office (NYFO)*

A coordinated census program for this species has not been undertaken across its range which would currently allow for detailed population estimates to be made. However, some estimates for BCR 30 (ACJV 2008) place the standing population at around 250,000 birds with a future goal of 500,000 birds.

### **Research needed:**

- In 2010, convene a teleconference with University of Maine to identify survey protocols for saltmarsh sharp-tailed sparrows that will be incorporated into a Long Island census of sparrow populations at the following sites: Gardiner County Park, Long Cove Fire Island National Seashore (FIIS), NYSDEC Fireplace Neck wetlands, The Nature Conservancy (TNC) Pine Neck Marsh and Wading River Marsh, Town of Hempstead Oceanside Marine Sanctuary and North Cinder Island, and New York

# Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

City Department of Parks wetlands near JFK Airport and Jamaica Bay (Long Island Field Office [LIFO]).

- Determine the feasibility of developing a monitoring network, similar to the Long Island Colonial Waterbird and Piping Plover survey program, that could undertake coordinated sampling for this and other species, by hold a meeting with the NYSDEC and other principal partners (LIFO).
- In 2010, initiate a status assessment for saltmarsh sharp-tailed sparrow. Coordinate one meeting of interested parties to discuss population objectives and sampling methodology for saltmarsh sharp-tailed sparrows on Long Island (LIFO).
- Build partnerships to determine the population objectives for each of the highest species of concern on Long Island within BCR 30. Additional species may be identified through this process that are on other watch lists or are State listed species. This is envisioned as a longer term initiative but critical to addressing bird conservation issues around Long Island for species using pelagic, forested, grassland, shoreline, and nearshore habitats.
- Participate in the annual two day survey of U.S. Geological Survey (USGS) Breeding Bird Survey routes (Hauppauge and Huntington routes) (LIFO).

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of habitat and habitat function.**

- a. Create a habitat mapping and modeling working group for the BCR to develop specific questions and strategies for conservation/landscape design and select a subset of priority species (focal species) that best represent priority species and habitats. This group should examine habitat mapping and modeling efforts from the eastern United States to assess the best overall strategy for developing a “best-fit” conservation design for BCR 30.
- b. Fee or easement acquisition of priority high-quality habitats including nesting, migratory stopover, and wintering areas, and the upstream headwaters and adjacent buffer habitats throughout the watershed that are central to improving and maintaining water quality in coastal marshes.
- c. Develop decision support tools using habitat data layers and bird-habitat models to determine where conservation should be targeted to optimally achieve population objectives for migratory birds. Make these tools useful and available at the BCR and state scales.



# **Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area**

## **2. Marsh management.**

- a. Restore hydrological conditions of saltmarshes supporting highest and high breeding and non-breeding priority species.
- b. Determine the affects of marsh management (mosquito control, marsh burning, open marsh water management, ditch plugging, phragmites control, etc.) and choose management programs with the most benefit to estuarine emergent wetland species.
- c. Control invasive species.
- d. Create dredge spoil material islands/marshes.

## **3. Possible point and non-point sources of mercury deposition.**

- a. Continue sampling efforts aimed at tracking blood mercury levels in saltmarsh sharp-tailed sparrows. Strategy will depend on results of research need noted above.

## **4. Climate change.**

- a. Control erosion in coastal marshes.
- b. Develop a targeted monitoring program for marsh species following a standardized regional (or national) protocol for both breeding and non-breeding habitats.
- c. Develop probabilistic models to predict the capacity of regions to support bird populations at present and in the future. Compare this capacity with the population and habitat objectives determined by stepping down continental goals. Work with USGS, states, and others to develop models (possibly as part of a Science Support or Multistate grant).

### *Partners/potential funding:*

NYSDEC Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010-2012

### **1. Loss of habitat and habitat function.**

## **Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area**

- a. Assess the carrying capacity needed to accomplish many of the conservation actions identified for priority species.
- b. Identify and protect the most critical coastal marsh habitats and buffers for priority species, taking into consideration projected sea level rise within the BCR to reduce threats from habitat loss, coastal development, and sea level rise.
- c. Improve nesting and wintering habitat quality at multiple geographic scales. For example, at an individual site improve habitat quality by controlling water levels and vegetation, reducing erosion and runoff to the area, and conserving or improving nesting or roosting habitats or buffer habitats (e.g., their width and vegetative composition) adjacent to wetlands. At the larger scale, protect or improve water quality throughout the watershed and increase the number, size, and connectivity of habitat patches (nesting, roosting, stopover, wintering, etc.) in the landscape.
- d. Work with the northeast states, USGS, U.S. Fish and Wildlife Service (USFWS) and other partners to complete the compiling and mapping of basic information on the distribution of existing species, habitat, and managed lands in the BCR including the most recent National Land Cover Data (NLCD) set as well as the more detailed Ecological Systems land cover when available. Organize information by BCR and state. Utilize relationship with regional National Biological Information Infrastructure (NBII) node and NBII bird conservation node to make the information available to partners through a Web site.

### **2. Marsh management.**

- a. Enhance/restore degraded wetlands and adjacent upland habitats (including buffers and marsh islands).
- b. Delivery will depend upon strategy determined from research above.

### **3. Possible point and non-point sources of mercury deposition.**

- a. Delivery will depend upon strategy determined from research above.

### **4. Climate change.**

*Partners/potential funding:*

NYSDEC Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

# Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

## OUTREACH

### Potential outreach needs:

- Landowner education
- Public outreach

### *Partners/potential funding:*

NYSDEC Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

## MONITORING

Develop best management practices from results of monitoring to inform future saltmarsh sharp-tailed sparrow population restoration activities.

- Development of protocols to measure progress/success.
- Monitoring to measure progress/success.

### *References*

Atlantic Coast Joint Venture. 2008. New England-Atlantic coast Bird Conservation Region (BCR) 30 Implementation Plan. Atlantic Coast Joint Venture, Laurel, Maryland.  
[http://www.acjv.org/BCR\\_30/BCR30\\_June\\_23\\_2008\\_final.pdf](http://www.acjv.org/BCR_30/BCR30_June_23_2008_final.pdf).

Brown, S., C. Hickey, B. Harrington, and R. Gill, eds. 2001. United States Shorebird Conservation Plan. 2<sup>nd</sup> edition. May 2001. Manomet Center for Conservation Sciences, Manomet, Massachusetts.

Clark, K.E., L.J. Niles, and members of the Northern Atlantic Shorebird Habitat Working Group. U.S. Shorebird Conservation Plan Northern Atlantic Regional Shorebird Plan Version 1.0. Endangered and Nongame Species Program, NJ Division of Fish and Wildlife, Woodbine, NJ.  
<http://www.fws.gov/shorebirdplan/RegionalShorebird/downloads/NATLAN4.pdf>.

Greenlaw, J.S. and J.D. Rising. 1994. Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:  
<http://bna.birds.cornell.edu/bna/species/112>.

## **Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area**

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

Peconic Estuary Program Office. 2001. Peconic Bay Comprehensive Conservation and Management Plan. Suffolk County Department of Health Services, Riverhead, New York.

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Iñigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panjabi, D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website. [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/) (VERSION: March 2005).

Kushlan, J.A., M.J. Steinkamp, K.C. Parsons, J. Capp, M. Acosta Cruz, M. Coulter, I. Davidson, L. Dickson, N. Edelson, R. Elliot, R. Michael Erwin, S. Hatch, S. Kress, R. Milko, S. Miller, K. Mills, R. Paul, R. Phillips, J.E. Saliva, B. Sydeman, J. Trapp, J. Wheeler, and K. Wohl. 2002. Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1. Waterbird Conservation for the Americas. Washington, DC, U.S.A.

Existing strategies for saltmarsh sharp-tailed sparrow restoration:

Please refer to the following document for existing strategies:

- Bird Conservation Plan for BCR 30 (Atlantic Coast Joint Venture 2008)  
[http://www.acjv.org/BCR\\_30/BCR\\_30\\_June\\_23\\_2008\\_final.pdf](http://www.acjv.org/BCR_30/BCR_30_June_23_2008_final.pdf).
- North American Waterbird Conservation Plan (Kushlan et al. 2002)  
<http://www.waterbirdconservation.org/nawcp.html>.
- U. S. Shorebird Conservation Plan (2001)  
<http://www.fws.gov/shorebirdplan/USShorebird/PlanDocuments.htm>.
- Peconic Bay Comprehensive Conservation and Management Plan  
<http://www.peconicestuary.org/CCMP.html>.
- South Shore Estuary Reserve Comprehensive Conservation and Management Plan  
[http://www.estuary.cog.ny.us/background-pages/SSER\\_Imp\\_Status\\_Report.pdf](http://www.estuary.cog.ny.us/background-pages/SSER_Imp_Status_Report.pdf).
- Long Island Sound Comprehensive Conservation and Management Plan  
<http://www.longislandsoundstudy.net/mgmtplan.htm>Ads.
- Conservation Strategies for the Orient Point to Plum Island Important Bird Area  
<http://ny.audubon.org/PDFs/OPPConservationPlanFINAL.pdf>.
- Comprehensive Restoration Plan for the Hudson-Raritan Estuary  
<http://www.nan.usace.army.mil/harbor/crp/>.
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm).

# Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

## Sandplain Gerardia Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

little/big bluestem, beardgrass, Indiangrass, panic grass, winter bentgrass, short-eared owl, meadowlark, American kestrel, white-tailed deer, eastern cottontail, prairie warbler, woodcock

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Annual plant found in grassland sandplains, flowering and seed production in August-October. Overall plan population was thought to have declined from 49 historical records to 10 populations remaining today. However, in 2007 - 8, two scientists from the University of Maryland completed research that calls into question whether *acuta* is a viable species. From an abstract of a presentation at the 2008 International Congress for Conservation Biology: (2008) James Pettingill, and Maile Neel in: "Upon being listed as a federally endangered species in 1988, *Agalinis acuta* was assumed to represent a distinct species. However, a phylogeny of the genus including single accessions of *Agalinis tenella* and *A. acuta* suggested the two species may not be independently evolving lineages. To better understand the evolutionary relationships of these species, we created a more comprehensive phylogeny from 7 chloroplast DNA loci and the nuclear ITS locus (total aligned length = 11,820 nucleotides) assayed from multiple individuals of these two species and 27 other congeneric species. The resulting phylogeny indicated that there was no statistical support for *A. tenella* and being reciprocally monophyletic and that *Agalinis decemloba* was also indistinguishable. To further evaluate the relationships among *A. tenella*, *A. acuta*, and *A. decemloba*, we sampled 64 morphological characters from multiple individuals from multiple populations of each species. These data suggest high correct classification rates at both the population and species levels. Given the fact that reciprocal monophyly is not always to be expected between recently diverged species due to incomplete lineage sorting and the results of the morphological data, we advocate that *A. acuta* continued to be protected under the Endangered Species Act until more rapidly evolving loci can be assayed." This year James Pettingill completed his dissertation which explores these questions further in: (2010) Elucidating the Macro- and Micro-evolutionary Relationships of the Federally Listed Endangered Species *Agalinis acuta* (Orobanchaceae). University of Maryland.

**Justification for species selection:** Federally-listed endangered species.

**State contribution to overall species population:** Long Island has 4 of the 11 stable range-wide populations (nearly 40%).

**Threats and threat assessment:**

## Sandplain *Gerardia (Agalinis acuta)*: Long Island Focal Area

Threats<sup>15</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Loss/degradation of habitat, suppression of fires/disturbance regimes, vegetative succession, and development.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
NA

**Factor C. Disease or predation:**

- A. Herbivory may play a role.

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Certain recreational activities (e.g. off-road vehicles [ORV] and dirt bikes, for which enforcement of rules is inadequate).

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Encroachment of invasive vegetation.

**Recovery Criteria:** From recovery plan:

There are 20 stable, wild populations located throughout the species historic range to ensure against any unpredictable events that could lead to reproductive failure and subsequent population decline. In order to be deemed “stable,” a population must maintain a five-year running geometric average population size of at least 100 individuals.

At least 15 of these populations are located on protected sites. Protection may be accomplished through: 1) ownership by a government agency or a private organization that considers maintenance of the *A. acuta* population to be the predominating management objective for the site; or 2) a deeded easement or covenant that effectively commits present and future landowners to implementing any management activities needed to perpetuate the population.

There must be proven technology for: 1) propagating the species in a cultivated setting; or 2) storing seed in a seedbank and successfully sowing them on a wild site.

**Recovery Goal for Focus Area:**

Maintain 4-7 sites with stable populations of 100 or more plants; Develop propagation plan; Develop action plan for genetics determination.

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<sup>15</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

## *Recovery Goals*

### **Research/Actions needed:**

- Meet with U.S. Fish and Wildlife Service (USFWS) personnel at USFWS Region 5 Biologist Conference (Feb. 2011) to agree upon a strategy to address *A. acuta* taxon now being *A. decemloba*, and the associated de-listing and possible re-listing. In coordination with USFWS Raleigh North Carolina Field Office, initiate efforts to determine *A. decemloba* range/distribution/abundance in southern states. Identify stakeholders and assign tasks (LIFO).
- Develop a range-wide plan to deal with non-governmental organizations (NGO) and others interested in habitat restoration, reintroduction, and habitat management. (WHO: LIFO has species lead; other involved offices in USFWS R-4 and R-5 to the south and New England Field Office [NEFO], Regional Office [RO]. Cost: TBD, seek potential listing funds for 2011).

## **CONSERVATION DESIGN**

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan 1989
- Last 5-year review completed in draft, 2009

Significant new research casts doubt as to whether *acuta* is a unique species – see introductory paragraph.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Address habitat loss by considering habitat restoration according to a range-wide plan for the species.
  1. Assist The Nature Conservancy (TNC) and Long Island National Wildlife Refuge Complex (LINWRC) in managing suitable habitat in Sayville and TNC properties (LIFO).
  2. Identify other areas where habitat management is critical to maintain existing populations of *agalinis* while its status is reviewed.

## Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

B. Develop a protocol for seed harvesting and redistribution of seeds within “populations”.

### Factors B and C. The inadequacy of existing regulatory mechanisms and other natural or manmade factors affecting its continued existence:

A. Develop outreach materials to promote species conservation.

1. Work with LINWRC to develop temporary/traveling exhibit about *agalinis*, and;
2. Develop outreach materials addressing impacts of ORV activity on listed plant species.

### OUTREACH

See above.

### MONITORING

Work with partner agencies in *decemloba*'s range and range of what we know of as *acuta* to assess success of habitat restoration projects.

Develop a successful monitoring protocol.

Seek funding to do evaluation of success of projects.

Seek data to determine if measures can be taken to preclude the need to list *decemloba*.

### Partners

### References

Pettingill, J. and Neel, M. 2008. "What Is The Taxonomic Status of the Federally Listed Endangered Species *Agalinis Acuta* (Orobanchaceae)?" Paper presented at the annual meeting of the International Congress for Conservation Biology, Convention Center, Chattanooga, TN, Jul. 10, 2008 <Not Available>. 2010-11-02  
<[http://www.allacademic.com/meta/p243624\\_index.html](http://www.allacademic.com/meta/p243624_index.html)>Pettingill, James and M. Neely.

Pettingill, J. 2010. Elucidating the Macro- and Micro-evolutionary Relationships of the Federally Listed Endangered Species *Agalinis acuta* (Orobanchaceae). Dissertation. University of Maryland.

U.S. Fish and Wildlife Service. 1989, Sandplain gerardia (*Agalinis acuta*) Recovery Plan. Northeast Regional Office, Hadley, MA.



# Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

## Seabeach Amaranth Species Action Plan

**FOCAL AREA: LONG ISLAND; SOUTH SHORE BARRIER ISLANDS**

*Other species benefitting:*

seabeach knotweed, dusty miller, sea rocket, sea spurge, least tern, common tern, black skimmer, piping plover, American oystercatcher

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** Annual plant found in barrier island beaches, germination in May-September, seed production in June-September. This species requires extensive areas of barrier islands and inlets, functioning in a relatively natural and dynamic manner. It often grows in the same areas selected for nesting by shorebirds such as plovers, terns, and skimmers. Seabeach amaranth appears to be intolerant of competition and does not occur on well-vegetated sites. The plant acts as a sand binder, with a single plant being able to create a dune up to 6 decimeters high, containing 2-3 cubic meters of sand (USFWS 1996). Seeds can withstand the conditions necessary to move among island conditions and it is likely that it has the ability to persist as seed banks in inlets and possibly offshore (USFWS 2007).

**Justification for species selection:** Federally-listed threatened species.

**State contribution to overall species population:** South Shore of Long Island provides for over 50% of the total range-wide population.

#### **Threats and threat assessment:**

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Destruction of suitable habitat is the most significant threat to this species.
- B. Long and short term shoreline erosion; species could persist as long as other suitable habitat exists; alternative sites often developed, hard shoreline, or utilized for recreation.
- C. Sea level rise.
- D. Preclusion of overwash/early successional habitat development.
- E. Storm-induced flooding.
- F. Storm damage protection and dredging projects.
- G. Certain recreational activities.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
NA

# Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

**Factor C. Disease or predation: Herbivory**

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Certain recreational activities poorly regulated after piping plover breeding season ends.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Vegetative succession
- B. Invasive species
- C. Climate change may be causing increased flooding and erosion of habitat

## ***Recovery Goals:***

***Range-wide Recovery Goals/Objectives:*** Seabeach amaranth will be considered for delisting when the species exists again in at least 6 of the states within its historic range [Delaware (DE), Massachusetts (MA), Maryland (MD), North Carolina (NC), New Jersey (NJ), New York (NY), Rhode Island (RI), South Carolina (SC), and Virginia (VA)], and when a minimum of 75 percent of the sites with suitable habitat within each state are occupied by amaranth populations for 10 consecutive years.

Recovery/Conservation Goal for Focus Area: 5,000-25,000 plants across south shore beaches

## **Research/Actions needed:**

Quantifying the effects of beach nourishment projects on seabeach amaranth recruitment; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. Long Island Field Office/New York Field Office [LIFO/NYFO] to support academia who propose research on Long Island).

Quantifying the effects of hardened structures in seabeach amaranth habitat; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Quantifying the effects of off-road vehicle (ORV) use and mechanical beach raking on seabeach amaranth germination, growth, and reproduction; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Quantifying the effects of symbolic fencing on seabeach amaranth germination, growth, and reproduction; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Determining the ecological requirements of seabeach amaranth, especially pertaining to the nutrients provided by birds, wrack, and other beach vegetation; (Who and cost: Recovery lead

## **Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area**

Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Determining the location of seed banks and seed dormancy; (Who and cost: Recovery lead Dale Suiter to determine. LIFO/NYFO to support academia who propose research on Long Island).

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan 1996
- Last 5-year review completed 06/04/07
  - Next 5-year review anticipated in 2012

**Research/Actions needed:** See range-wide recovery goals/research needed. None proposed by NYFO/LIFO at present time.

### **CONSERVATION DELIVERY**

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Address sea level rise and preclusion of overwash/early successional habitat development by influencing (via Endangered Species Act [ESA] and/or Fish and Wildlife Coordination Act [FWCA] consultations) Federal construction agency to construct lower dune profile to promote natural coastal processes. This includes Fire Island to Montauk Point (FIMP), Interim projects, Fire Island community projects, and Federal Emergency Management Agency (FEMA) funded storm mitigation.
- B. Address storm-induced flooding; promote natural processes.
- C. Address storm damage protection and dredging projects.
  1. Influencing Federal permitting and construction agencies by establishing dredged material disposal windows to minimize impacts to the plants.
- D. Address certain recreational activities.
  1. Establish symbolic fencing; actively manage and protect habitat for plovers and seabeach amaranth at Breezy Point Co-op and Village of Westhampton Dunes, and provide recommendations to land managers regarding protection of amaranth along

## Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

the south shore of Long Island. Assist in installation of symbolic fencing as needed (LIFO).

2. Protect existing populations and essential habitat.
3. Determine and implement the management necessary for long-term reproduction, establishment, maintenance, and vigor.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
NA

**Factor C. Disease or predation: Herbivory**

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Certain recreational activities poorly regulated after piping plover breeding season ends
  1. Enforce laws protecting the species and/or its habitat.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Vegetative succession: Address by promoting habitat restoration projects.
- B. Invasive species: Address by promoting habitat restoration projects.
- C. Climate change: Promote natural processes that create suitable habitat.
- D. Climate change may be causing increased flooding and erosion of habitat.
- E. Annually assess the success of the recovery efforts for the species.

### OUTREACH

Develop materials to inform the public about the status of the species and the recovery plan objectives.

### MONITORING

Review and track recovery progress. Conduct species surveys at Breezy Point, Westhampton Dunes. Assist in surveys throughout Long Island as needed (LIFO).

Maintain Long Island-wide database on species abundance and convey to Dale Suiter, Wendy Walsh (LIFO).

*Partners*

## **Seabeach Amaranth (*Amaranthus pumilus*): Long Island Focal Area**

The Nature Conservancy; New York State Department of Environmental Conservation (NYSDEC); U.S. Army Corps of Engineers; National Park Service's Fire Island National Seashore and Gateway National Recreation Area; Suffolk County Department of Parks and Recreation; New York State Office of Parks, Recreation and Historic Preservation; New York State Natural Heritage Program; Breezy Point Cooperative; Town of Hempstead; New York City Urban Park Rangers; Town of Babylon; Town of Southampton; Town of Easthampton.

### *References*

U.S. Fish and Wildlife Service. 1996. Recovery Plan for Seabeach Amaranth (*Amaranthus pumilus*). Southeast Region, Atlanta, GA.

U.S. Fish and Wildlife Service. 2007. Seabeach Amaranth (*Amaranthus pumilus*) 5-year review: Summary and Evaluation. Southeast Region, Ecological Services, Raleigh, NC.

# Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area

## Eastern Tiger Salamander Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

Pine barrens buck moth, spotted salamander, spotted turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** From New York State Department of Environmental Conservation (NYSDEC) website at <http://www.dec.ny.gov/animals/7143.html>. The tiger salamander is one of the largest terrestrial salamanders in the United States. The biggest specimen recorded was 13 inches long. The average size ranges between 7 and 8 inches. It is stocky with sturdy limbs and a long tail. The body color is dark brown, almost black, and irregularly marked with yellow to olive colored blotches. The only other salamander with which it might be confused is the smaller spotted salamander (*Ambystoma maculatum*). The spotted salamander, however, has two rows of regular, yellow-to-orange spots running parallel down its back, compared to the irregularly distributed spots of the tiger salamander.

The tiger salamander inhabits sandy pine barren areas with temporary or permanent pools for breeding and is thus emblematic of the endangered habitat on the sand plains of eastern Long Island. The tiger salamander spends most of its life underground, as do other members of the group referred to as "mole salamanders." On Long Island, the tiger salamander emerges from its burrow in February or March to migrate at night, usually during rain, to the breeding ponds. After a brief courtship, which consists of the male pushing his nose against the female's body, eggs are laid in a mass and attached to twigs and weed stems under water. The female may deposit one or more egg masses containing 25-50 eggs per mass. Hatching occurs after approximately 4 weeks, and the larvae remain in the ponds until late July or early August. After this time, the larvae transform into air breathing sub-adults measuring between 4 and 5 inches, and leave the ponds at night during wet weather to begin their underground existence. It takes 4 to 5 years for the tiger salamanders to reach sexual maturity and they may live for 12-15 years. The tiger salamander eats invertebrates and small vertebrates.

**Justification for species selection:** Selected as a representative species of wooded freshwater wetland habitats. This species is a New York State endangered species whose range in the northeastern United States is limited to New York.

**State contribution to overall species population:** Species has been extirpated from the rest of New York; the nearest population is in southern New Jersey. More widespread across the central states but everywhere in decline. Breeding areas now limited to approximately 80 small ponds on Long Island.

# Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area

## Threats and threat assessment:

1. Loss of habitat has been responsible for the extirpation of this species from heavily developed western Long Island. Recent surveys have identified about 90 breeding ponds in New York, confined to eastern Nassau County and Suffolk County. Threat of development.
2. Suppression of fire has allowed for conversion of open, grassland and shrub scrub pine barren communities to thick pine-dominated thickets.
3. Habitat fragmentation has threatened the species as increased construction of roads and other land use patterns have also bisected the habitat, jeopardizing migrating adults.
4. Pesticides and other contaminants, including emerging contaminants, threaten the species on the densely populated island which is their last refuge in the State.
5. Disturbance at breeding ponds may include filling isolated breeding areas which are no longer protected by the Clean Water Act Section 404 (post Solid Waste Association of Northern Cook County [SWANCC] decision) nor large enough to be protected by the State freshwater wetlands act (must be >12.4 acres, unless otherwise identified to be unique resources).
6. Introduction of predatory fish into permanent pools and expansion of bullfrog populations threaten annual reproduction.
7. Recreational activities, especially off-road vehicles (ORV), further impact breeding sites and year round habitat.

## Research needed:

- Investigation into the genetic makeup of this isolated population.
- Population viability analysis.
- Formulation of population goals.
- Identification of habitat restoration and creation methods and landscape scale requirements for long term sustainability of the population.
- Investigation of the potential for captive rearing and introduction into restored and protected habitat in its historic range.

## *Partners/potential funding:*

NYSDEC, Suffolk County, State University of New York – Cortland (SUNY-Cortland)

# Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area

## *Population goal(s) for New York State:*

A stable to increasing population, with viable genetic variability, with permanent protection of key breeding habitat.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

1. Coordinate with NYSDEC on how to best assist them in tiger salamander recovery and identify U.S. Fish and Wildlife Service (USFWS) role in this effort.
2. Address loss of habitat including loss by suppression of fire by:
  - a. Developing a coalition of interested scientists to address habitat loss.
  - b. Influencing planning and regulatory agencies by providing information about rare amphibians and reptiles and their conservation needs.
3. Address habitat fragmentation by:
  - a. Developing a green infrastructure study group, and
  - b. Developing a green infrastructure plan for long term landscape scale conservation of rare amphibians and reptiles and associated plant communities.
4. Address pesticides and other contaminants, including emerging contaminants.
  - a. Develop an outreach program to address pesticides and other contaminants, and explore alternatives which could be utilized in sensitive habitats.
  - b. Investigate development of a On-/Off-Refuge research proposal to address impact of contaminants on this and/or other herpetile species and seek funding for such work. (Environmental Contaminants [EC] FY2011)
5. Address disturbance at breeding ponds by:
  - a. Creating a program involving symbolic fencing of sensitive areas and buffers during critical times of the year.
  - b. Developing an outreach program which is targeted at ORV users and other sources of disturbance.



## **Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area**

- c. Developing an outreach program targeted at community leaders within the critical habitat areas and potential restoration areas.
  - d. Developing a program with partners to do “salvage and rescue” operations when unprotected vernal pools and other small ephemeral wetlands are slated for destruction.
  - e. With partners, explore captive rearing of Long Island genetic strains of tiger salamanders, and reintroduction into the wild where sufficient long term protection of habitat is assured.
6. Address the introduction of predatory fish into permanent pools and the expansion of bullfrog populations, both of which threaten annual reproduction, by:
    - a. Developing a program involving pet store owners and the Long Island Herpetological Society and others to discourage release of unwanted pets, including exotic herps.
  7. Address uncontrolled recreational activities, especially ORVs by:
    - a. Convene a workshop of land managers, similar to pre-season piping plover recreational activity management workshops, to develop recreational activity management for ephemeral pool and buffer area protection for tiger salamander breeding areas.
    - b. Develop standard protocols for recreational activity management to minimize take.
    - c. Develop training materials to distribute to land managers and their staff.

*Partner organizations:* See above

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. Address loss of habitat by:
  - a. Convening a workshop of herpetologists, academic researchers, local non-governmental organizations (NGO), to explore opportunities for habitat restoration in the Pine Barrens and in historic habitat where restoration of suitable blocks of habitat may be possible.
    - i. Meet Natural Heritage Staff, American Museum of Natural History, and noted herpetologists (e.g. J. Gibbs, A. Breisch, P. Ducey) to develop an overall strategy.
    - ii. Plan and convene the workshop on Long Island.

## Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area

- iii. Produce proceedings and a standing committee to address amphibian habitat issues on Long Island.
  - b. Influencing planning and regulatory agencies by providing information about rare amphibians and reptiles and their conservation needs.
2. Address habitat fragmentation by:
  - a. Developing a green infrastructure study group.
    - i. Through action item 1Ai, work with a subset of workshop participants to seek funding to develop a landscape scale green infrastructure plan for amphibian and reptile conservation on LI.
  - b. Developing a green infrastructure plan for long term landscape scale conservation of rare amphibians and reptiles and associated plant communities
    - i. With contractors and group of stakeholders, map out green infrastructure plan; utilize information from research studies regarding dispersal patterns once larvae hatch and juveniles move out around the landscape.
    - ii. With steering committee, develop a strategy to ensure that the green infrastructure plan is incorporated into county and local municipal land-use plans.
    - iii. Promote pilot projects involving an underground tunnel to facilitate juvenile dispersal across the landscape.
3. Address pesticides and other contaminants, including emerging contaminants.
  - a. Develop an outreach program to address pesticides and other contaminants, and explore alternatives which could be utilized in sensitive habitats.
    - i. Utilizing term employees and Student Career Experience Program (SCEP) or Student Temporary Employment Program (STEP) opportunities, research pesticide use, and other contaminants and their effects on vernal pool breeding amphibians.
    - ii. Develop minimum standards for buffers to protect amphibian breeding areas from contamination.
    - iii. Develop Fact Sheets to post on the website to convey this information to the public.

## Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area

- b. Implement a research proposal to address impact of contaminants on this and/or other herpetile species when such work is funded.
4. Address disturbance at breeding ponds by:
  - a. Coordinate with NYSDEC and State Parks on feasibility/need of creating a program involving symbolic fencing of sensitive areas and buffers during critical times of the year.
    - i. With State Parks, create a pilot program to assess whether this will help control encroachment on breeding areas.
  - b. Developing an outreach program which is targeted at ORV users and other sources of disturbance.
  - c. Developing an outreach program targeted at community leaders within the critical habitat areas and potential restoration areas.
  - d. Developing a program with partners to do “salvage and rescue” operations when unprotected vernal pools and other small ephemeral wetlands are slated for destruction.
    - i. Complete a memorandum with New York State Department of Transportation (NYSDOT) to ensure notification of resource agencies before destruction of amphibian breeding areas, to allow for salvage.
  - e. With partners, explore captive rearing of Long Island genetic strains of tiger salamanders, and reintroduction into the wild where sufficient long term protection of habitat is assured.
5. Address the introduction of predatory fish into permanent pools and the expansion of bullfrog populations, threaten annual reproduction, by:
  - a. Developing a program involving pet store owners and the Long Island Herpetological Society and others to discourage release of unwanted pets including exotic herps.
6. Address uncontrolled recreational activities, especially ORVs by:
  - a. Convening a workshop of land managers, similar to pre-season piping plover recreational activity management workshops, to develop recreational activity. See above. Management for ephemeral pool and buffer area protection for tiger salamander breeding areas.

## **Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area**

- b. Developing standard protocols for recreational activity management to minimize take.
- c. Developing training materials to distribute to land managers and their staff.

### **OUTREACH**

Develop an urban herpetological initiative, towards conservation of this and other declining populations of species threatened by urbanization of Long Island, in part through classroom educational programs with partner agencies including TNC, American Museum of Natural History (AMNH), local herpetological societies, the New York State Natural Heritage Program, and others.

### **MONITORING**

Coordinate with NYSDEC on need to supplement/expand/assist in their annual monitoring efforts.

Protocols for measuring the success of any on the ground habitat restoration or species reintroduction work will have to be developed.

Formation of a coalition of interested parties to carry out the success monitoring should be formed.

### *References*

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- Pfingsten, R.A. and F.L. Downs. 1989. Salamanders of Ohio. Bulletin of the Ohio Biological Survey. Vol. 7 No. 2. College of Biological Sciences The Ohio State University, Columbus.
- Petranka, J.W. 1998. Salamanders of the United States and Canada. Smithsonian Institute Press, Washington and London.

## **Eastern Tiger Salamander (*Ambystoma tigrinum*): Long Island Focal Area**

Stine, C.J. 1984. The Life History and Status of the Eastern Tiger Salamander, *Ambystoma tigrinum*. Bulletin of the Maryland Herpetological Society. Vol. 20 No. 3.

Vogt, R.C. 1981. Natural History of Amphibians and Reptiles of Wisconsin. The Milwaukee Public Museum, Milwaukee, Wisconsin.

# Winter Flounder (*Pseudopleuronectes americanus*): Long Island Focal Area

## Winter Flounder Species Action Plan

### FOCAL AREA: LONG ISLAND

#### *Other species benefitting:*

windowpane flounder, summer flounder, scup, black seabass

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** From Essential Fish Habitat Source Document: National Oceanic and Atmospheric Administration (NOAA) Tech. Memorandum National Marine Fisheries Service (NMFS)-NE-138 (U.S. Dept. of Commerce 1999). The winter flounder, *Pseudopleuronectes americanus*, a small-mouthed, right-eyed flounder is a valuable commercial and recreational species. It is distributed along the northwest Atlantic coast as far north as Labrador and as far south as North Carolina and Georgia. One of the more familiar fishes in the Gulf of Maine, winter flounder are common on Georges Bank and in shelf waters as far south as Chesapeake Bay, and are ubiquitous in inshore areas from Massachusetts to New Jersey.

The species is managed as three separate stocks - the Gulf of Maine, southern New England and the Middle Atlantic, and Georges Bank. However, there have been questions as to whether the population on Georges Bank, where fish tend to grow larger and have different meristic characteristics and movement patterns than those residing inshore, is in fact a separate species. It has been concluded that many of these differences could be attributed to temperature.

Except for the Georges Bank population, adult winter flounder migrate inshore in the fall and early winter and spawn in late winter and early spring throughout most of their range. In northern waters, spawning occurs somewhat later: April in Passamaquoddy Bay and May and June in Newfoundland. After spawning, adults typically leave inshore areas although some remain inshore year-round.

Winter flounder have been described as omnivorous or opportunistic feeders, consuming a wide variety of prey. Polychaetes and crustaceans (mostly amphipods) generally make up the bulk of the diet. They feed on bivalves, capelin eggs, and fish.

Adult winter flounder are preyed upon by a wide variety of predators including striped bass, bluefish, spiny dogfish, goosefish, oyster toadfish, and sea raven. Cormorants, blue herons, seals, and ospreys have also been cited as predators.

Winter flounder eggs are generally collected from very shallow waters (less than about 5 m), at water temperatures of 10 degrees C or less, and salinities ranging from 10 to 30 parts per thousand (ppt). These shallow water, nearshore, habitats are of critical importance because they are most likely to be impacted by human activities. The type of substrate where eggs are found

## Winter Flounder (*Pseudopleuronectes americanus*): Long Island Focal Area

varies, having been reported as sand, muddy sand, mud, and gravel, although sand seems to be the most common.

**Justification for species selection:** Selected as a representative species of demersal (on or near the bottom) tidal water habitats. This is an important commercial and recreational fishery species. The species is recognized as an important species requiring management by the Atlantic States Marine Fisheries Commission in their management plan for winter flounder of 2005.

**State contribution to overall species population:** Commercial landings of winter flounder peaked in the 1980s throughout its range and have since declined (U.S. Dept. of Commerce, 1999). The New York State Department of Environmental Conservation (NYSDEC) recognized that winter flounder populations are overharvested and designated it as a species of greatest conservation need in their wildlife strategy plan (NYSDEC 2010).

In the southern New England-Middle Atlantic stock, biomass declined from 39,000 metric tons (mt) in 1981 to a record low of 8,500 mt in 1992. Contributions from strong year classes in 1992 and 1994 have rebuilt the stock biomass to 18,000 mt in 1996, but the stock remains overexploited (U.S. Dept. of Commerce, 1999). The southern New England-Middle Atlantic spawning stock biomass (which includes Long Island/New York) is only 9% of the target spawning stock biomass (ASMFC 2005).

### Threats and threat assessment:

1. Nearshore water quality degradation;
2. Suspended sediments from dredging;
3. Entrainment/impingement from power plants and other activities;
4. Commercial and recreational overfishing; and,
5. Habitat alteration from channeling and bulkheading.

### Research needed:

- Focus research on quantifying mortality associated with habitat loss and alteration, contamination by toxics, and power plant entrainment and impingement (U.S. Dept. of Commerce 1999).
- Research studies should be designed to provide reliable estimates of anthropogenic mortality from sources other than fishing. Both mortality sources should then be incorporated into fisheries yield/recruit models to simultaneously evaluate these dual mortality factors (U.S. Dept. of Commerce 1999).

## **Winter Flounder (*Pseudopleuronectes americanus*): Long Island Focal Area**

- Examine the implications of stock mixing from data from the Great South Channel region (U.S. Dept. of Commerce 1999).
- Conduct studies to delineate all major substocks in terms of geographic spawning area and seasonal offshore movements (e.g. exposure to fishing pressure) (U.S. Dept. of Commerce 1999).
- Conduct studies to identify major predators (such as seals, cormorants, or striped bass) of winter flounder and quantify their potential impact on winter flounder stocks. Special emphasis may be warranted on local spawning populations of winter flounder (U.S. Dept. of Commerce 1999).
- Study use of oyster shell hash and reef structures by juvenile winter flounder (NYSDEC 2010).
- Identify and map habitats important to juvenile and spawning winter flounder (NYSDEC 2010).

### *Partners/potential funding:*

NYSDEC, NMFS/NOAA, Atlantic States Marine Fisheries Commission (ASMFC)

### *Population goal(s) for New York State:*

Increase population, with viable genetic variability. The southern New England-Middle Atlantic spawning stock biomass (which includes Long Island/New York) target is 42.7 million pounds (ASMFC 2005). Rebuild winter flounder stocks in sufficient abundance to support stable, productive commercial and recreational fisheries by 2015 (NYSDEC 2010).

## **CONSERVATION DESIGN**

### *Strategies for addressing those threats*

1. Address nearshore water quality degradation by:
  - a. Supporting Federal, State, and local watershed management efforts.
  - b. Promoting use of non-toxic materials for in-water structures.
2. Address suspended sediments from dredging by:
  - a. Providing comments on Section 10/404 permit applications.
3. Address entrainment/impingement from power plants and other activities by:



## Winter Flounder (*Pseudopleuronectes americanus*): Long Island Focal Area

- a. Completing Fish and Wildlife Coordination Act (FWCA) consultations with Federal agencies.
4. Address commercial and recreational overfishing by:
  - a. Supporting NYSDEC and ASMFC efforts in establishing and enforcing landing limits.
5. Address habitat alteration from channeling and bulkheading by:
  - a. Providing comments on Section 10/404 permit applications.

*Partner organizations:* See above

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. Address nearshore water quality degradation by:
  - a. Supporting Federal, State, and local watershed management efforts. Review watershed management/local waterfront revitalization program plans, support efforts to improve nearshore water quality as such plans are proposed.
  - b. Promoting use of non-toxic materials for in-water structures. When reviewing Section 10/404 permit applications, recommend use of non-toxic materials for in-water structures such as bulkheads, piers, pilings, and boat lifts. (Long Island Field Office [LIFO]).
  - c. Evaluate effects of environmental contaminants on resources of Newtown Creek and the East River– initiate Newtown Creek Natural Resource Damage Assessment and Restoration (NRDAR).
  - d. Coordinate Gowanus Canal Biological Technical Assistance Group (BTAG) activities to maximize potential for a remedy which protects wildlife, with U.S. Environmental Protection Agency (USEPA) (Environmental Contaminants [EC]).
2. Address suspended sediments from dredging by:
  - a. Providing comments on Section 10/404 permit applications. When reviewing Section 10/404 permit applications, recommend time of year restrictions so that dredging activities, which increase suspended sediment concentrations, do not occur during winter flounder spawning (generally October- March, coordinate with NYSDEC to confirm) (LIFO).

## Winter Flounder (*Pseudopleuronectes americanus*): Long Island Focal Area

3. Address entrainment/impingement from power plants and other activities by:
  - a. Completing FWCA consultations with Federal agencies. Consult with U.S. Army Corps of Engineers (USACE)/Federal action agencies that authorize, fund, or undertake actions (power plants, tidal power projects) which could entrain/impinge winter flounder and provide recommendations/conservation measures to avoid/minimize or compensate for these impacts (LIFO).
4. Address commercial and recreational overfishing by:
  - a. Supporting NYSDEC/NMFS/ASMFC efforts in establishing and enforcing landing limits.
5. Address habitat alteration from channeling and bulkheading by:
  - a. Providing comments on Section 10/404 permit applications. When reviewing Section 10/404 permit applications, recommend conservation measures that avoid, minimize, or compensate for impacts associated with channeling and/or bulkheading of nearshore habitats (LIFO).
6. Coordinate with NYSDEC on mapping winter flounder habitat, development of management goals and objectives.

### OUTREACH

Support NYSDEC, NMFS/NOAA, ASMFC in any outreach efforts they propose.

### MONITORING

Support NYSDEC, NMFS/NOAA, ASMFC in any monitoring efforts they propose.

### References

Atlantic States Marine Fisheries Commission. 2005. Amendment 1 to the Interstate Fisheries Management Plan for inshore stocks of Winter Flounder. Fishery Management Report No. 43. NOAA.

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U.S. Department of Commerce. 1999. Essential Fish Habitat Source Document: Winter Flounder *Pseudopleuronectes americanus* Life History and Habitat Characteristics. NOAA, NMFS, Northeast Region, Northeast Fisheries Science Center, Woods Hole, MA. NOAA Technical Memorandum NMFS-NE-138.

## LOWER HUDSON FOCAL AREA

The Lower Hudson Focal Area (LHFA) is located in southeastern New York and contains approximately 4,535 square miles or 8.3% of the state. The focal area is largely demarcated by the Lower Hudson River watershed, which extends from the Battery at the southern end of Manhattan to the Rensselaer-Columbia county line. A small portion of the Neversink River in the Delaware River watershed is also included in this focal area. The LHFA contains a wide variety of ecoregions including the glacially deepened Hudson River Valley, the Taconic Foothills and portions of the Taconic Mountains, the Ridge and Valley, and sections of the Pocono Highlands and Catskill Mountains. Local relief ranges from 25-300 feet in areas dominated by large rivers and lowlands up to 1000-2000 feet in mountainous areas. Overall elevation ranges are 0-4180 feet. This focal area is characterized by the tidally influenced Hudson River Valley as well as the complex terrain associated with a variety of mountainous regions and geological histories.

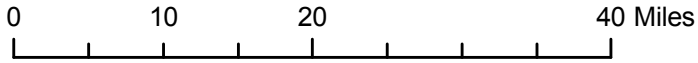
The Hudson River stretches from the Adirondack Mountains to the Battery in Manhattan and is one of the largest watersheds in the eastern United States. More than 8,000,000 people live within this corridor, and it has historically been and is currently one of the major transportation and commercial centers in the country. All of, or portions of, eleven counties are included within the LHFA boundary including Columbia, Greene, Dutchess, Ulster, Sullivan, Orange, Putnam, Westchester, Rockland, Bronx, and New York. Approximately 3,500,000 people live within this focal area, concentrated primarily in the New York Metropolitan area and along the Hudson River, but with other concentrations across the focal area (i.e. Middletown). Land uses transition from heavily urbanized and residential to agriculture with increasing distance from major metropolitan areas to forest with increasing distance from the Hudson River Valley and increasing elevation.

This focal area was selected because it contains significant tidal wetland habitats and habitat complexes located along the Hudson River as well as unique and varied upland habitats. There are currently five Federally-listed species (endangered [E], threatened [T], candidate [C]) and two identified species of concern within the focal area. The productive estuary area of the Hudson River is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine, and marine fish species, including the American eel, and is a migratory and feeding area for birds, including the bald eagle, and fish that feed on the abundant fish and benthic invertebrate resources in this area. Forests, forested wetlands, and the variety of other habitats in the LHFA are also important habitats for Indiana bat (E), bog turtle (E), Blanding's turtle, small whorled pogonia orchid (T), and northern monkshood (T). Successional habitats are also present that are important for New England cottontail (C). Lastly, high quality streams in the Neversink River Valley support populations of dwarf wedgemussel (T).

The NYFO actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss, land conversion, fish barriers, habitat succession, invasive species, decreased habitat complexity, degraded water quality, and

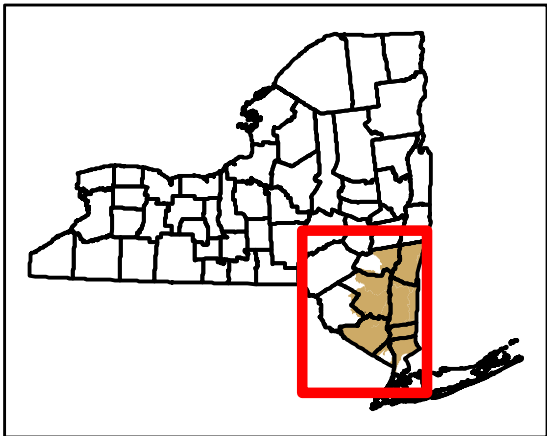
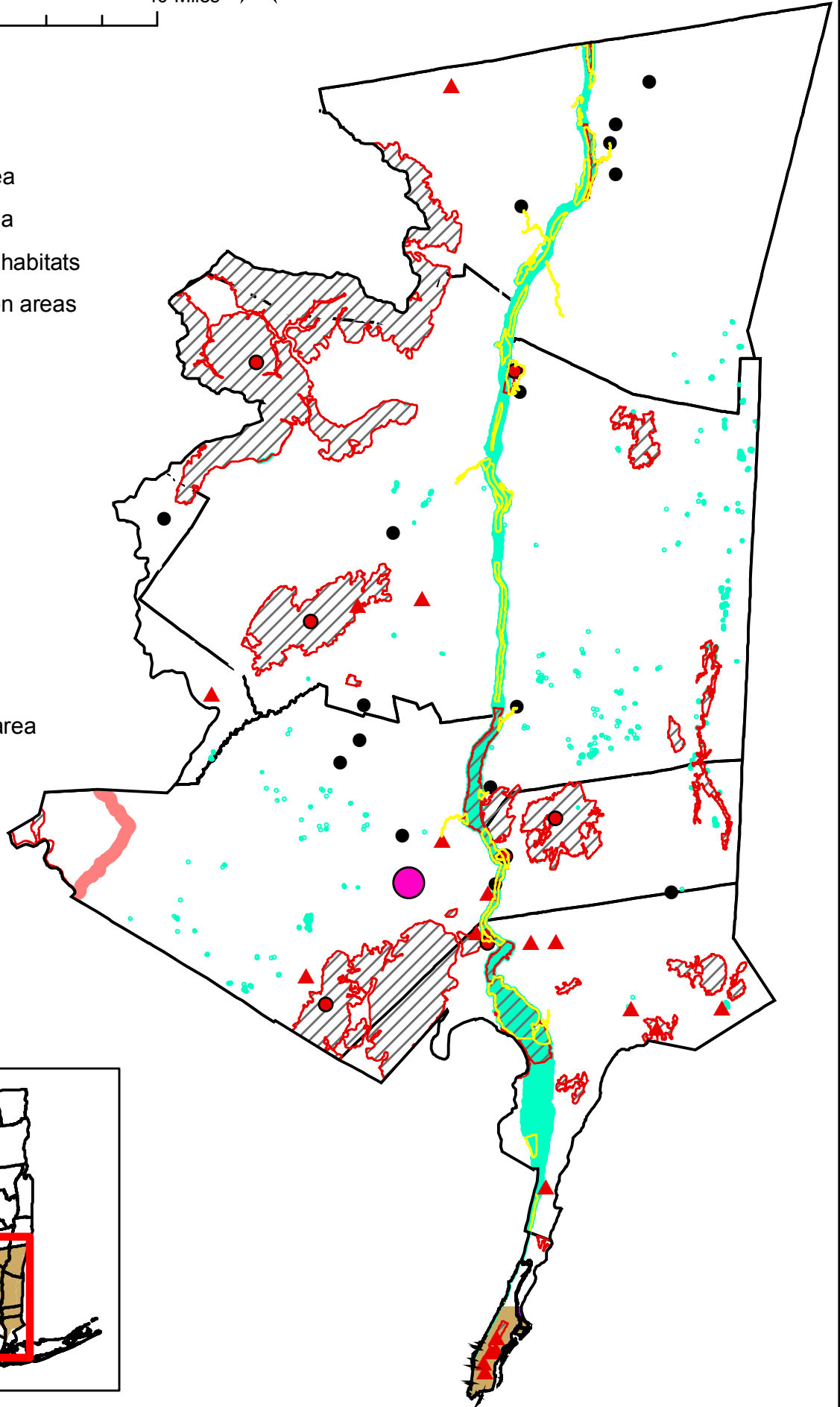
climate change. Current projects include the Hudson River Natural Resource Damage Assessment (NRDA), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

# Lower Hudson Focal Area



## Legend

- Neversink mussel area
- Small whorled pogonia
- Dept of State coastal habitats
- DEC Bird conservation areas
- ▲ Hawkwatch sites
- Important bird areas
- Hydro projects
- Endangered species
- Protected lands
- Karner habitat
- NEC focal areas
- Bog turtle potential
- Indiana bat habitat
- Lower Hudson focal area



# **American Eel (*Anguilla rostrata*): Lower Hudson Focal Area**

## **American Eel Species Action Plan**

### **FOCAL AREA: LOWER HUDSON**

#### *Other species benefitting:*

blueback herring, American shad, alewife, shortnose sturgeon, Atlantic sturgeon, striped bass

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** American eel is a semelparous, catadromous species that is a habitat generalist. Their range includes rivers and inland lakes accessible from the Atlantic Ocean. Eel mature in 8 – 30+ years in freshwater prior to migrating to spawn in the Sargasso Sea. All eel mortality in freshwater occurs prior to spawning, resulting in a cumulative impact.

**Justification for species selection:** American eel stocks range-wide have shown a dramatic decline in the last 20 years. American eel is a Federal trust species. The species underwent a status review by the U.S. Fish and Wildlife Service (USFWS), but was not designated as threatened or endangered. A recent petition was filed to list the species; this petition is currently under review. The Atlantic States Marine Fisheries Commission (ASMFC) developed an Interstate Fishery Management Plan for American eel in 2000, with addendums in 2006 and 2008.

**State contribution to overall species population:** The American eels found in the Lake Ontario/St. Lawrence River basin are exclusively female and represent the largest, most fecund individuals found in the spawning population. As such, it is generally agreed that these females represent a critical component of the spawning population. The Lower Hudson contributes a substantial proportion of the overall spawning population.

#### **Threats and threat assessment:**

- 1. Barriers to riverine movement and upstream habitat access.**
- 2. Hydro turbine mortality of outmigrating eel.**
- 3. Overfishing.**
- 4. Habitat degradation and alteration.**
- 5. Contaminants.**
- 6. Parasitism.**
- 7. Climate change;** potential to affect ocean currents and dispersal of larval eel.

# American Eel (*Anguilla rostrata*): Lower Hudson Focal Area

## 8. Cumulative threats.

### Research needed:

- Conduct surveys to determine stock goals for Lower Hudson.

(Who: Unknown; Cost: Unknown)

### *Population goal(s) for New York State:*

The American eel is a panmictic species with a single population. The goal for the Lower Hudson River basin is to maintain the species as a viable, self-reproducing portion of the ecosystem.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### 1. Barriers to riverine movement and upstream habitat access.

- a. Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts.
- b. Provide technical assistance on stream restoration projects in the watershed, as requested; target USFWS habitat restoration projects to benefit American eel; preserve, restore, and/or enhance streams known to support American eel ([Partners for Fish and Wildlife \[PFW\]](#)) (staff time plus unknown dollars).
- c. Preserve high quality streams known to support American eel (Conservation Planning Assistance [CPA]) (staff time only).

#### 2. Hydro turbine mortality of outmigrating eels.

- a. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities (CPA) (staff time only).

#### 3. Overfishing.

#### 4. Habitat degradation and alteration.

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, and dredging and placement of fill in streams and wetlands (CPA) (staff time only).

## American Eel (*Anguilla rostrata*): Lower Hudson Focal Area

- b. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions (CPA) (staff time only).
  - c. Address status assessment and listing proposal. (Endangered Species [ESA], CPA) (staff time only).
5. **Contaminants** (including dams and impassable culverts).
  - a. Use Hudson River Natural Resource Damage Assessment (NRDA) case to direct restoration activities.
  - b. Determine if contaminants are a significant threat to eels.
  - c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
6. **Parasitism.**
7. **Climate change** (including dams and impassable culverts).
  - a. Follow literature to determine if these are actions we need to pursue.
8. **Cumulative threats.**
  - a. Address status assessment and listing proposal (ESA, CPA) (staff time only).

### *Partner organizations:*

Please refer to the following documents for existing strategies:

- ASMFC/National Oceanic and Atmospheric Administration (NOAA) – Interstate Fishery Management Plan for American Eel
- Coordinate efforts with other organizations/agencies

USFWS-Lower Great Lakes Fish and Wildlife Conservation Office, U.S. Geological Survey, New York State Department of Environmental Conservation, State University of New York – College of Environmental Science and Forestry.

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Barriers to riverine movement and upstream habitat access.**



## **American Eel (*Anguilla rostrata*): Lower Hudson Focal Area**

- a. Address barriers to riverine movement and upstream habitat access by barrier mitigation and habitat restoration/enhancement.
- 2. Hydro turbine mortality of outmigrating eel.**
    - a. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews (CPA) (staff time only).
      - i. Green Island (Done)
      - ii. Normanskill
      - iii. Stuyvesant Falls
- 3. Overfishing.**
  - 4. Habitat degradation and alteration.**
    - a. Review dredging projects for impacts to eels (CPA) (staff time only).
    - b. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews (CPA) (staff time only).
- 5. Contaminants.**
    - a. Manage assessment for FWS for the Hudson River NRDA; review results of fish toxicity pilot study and determine next steps; consider restoration projects that benefit American eel, if possible. (Environmental Contaminants [EC])
    - b. Determine if contaminants are a significant threat to eels.
      - i. Continue with the second year of the funded Off Refuge Laboratory Study, Reproductive Effects of Contaminants on Artificially Matured and Fertilized American Eels (FY 2011-2012) (EC) (staff and analytical funding).
    - c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
      - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat (FY 2011-2013) (EC, CPA) (staff time only).
- 6. Parasitism.**
    - a. No work identified at this time.

# American Eel (*Anguilla rostrata*): Lower Hudson Focal Area

## 7. Climate change.

- a. No work identified at this time.

## 8. Cumulative threats.

- a. [Address status assessment and listing proposal \(ESA, CPA\) \(staff time only\).](#)

## OUTREACH

Status assessment and listing proposal

## MONITORING

- Development of protocols to measure progress/success
- Monitoring to measure progress/success
- Investigate potential barrier removals and available habitat both pre- and post-removal

## *References*

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# **Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area**

## **Bald Eagle Species Action Plan**

### **FOCAL AREA: LOWER HUDSON**

#### *Other species benefitting:*

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

### **BIOLOGICAL PLANNING**

#### *Introduction to species:*

**Species information:** Although newly delisted from the Federal endangered species list, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. During the 2009 winter survey, 79 total eagles (41 adults, 38 immatures) were seen along the lower Hudson River during the yearly aerial count; depending on availability of open water, eagles also overwinter near the NY city reservoirs just west of this focal area. During the evening roosting count within a 20-25 mile stretch of river between Fishkill and Croton Point, 257 eagles were counted in 2009. In 2009, State-wide, 173 breeding pairs were identified as successful and fledged 223 young. Also in 2009, 195 nesting territories were identified.

**Justification for species selection:** Once Federally delisted, the bald and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still State listed and a new permit program for authorization of unavoidable take is slowly being utilized. The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the ridge just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and in the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines.

## **Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area**

**State contribution to overall species population:** The New York State Department of Environmental Conservation (NYSDEC) does an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate between resident eagles and seasonal migrants in the annual count in January. The Lower Hudson River consistently supports the greatest number of wintering eagles in the State (in 2009, 79). According to the NYSDEC, the reason we have come to expect the greatest numbers of wintering eagles in this area is that during a “typical” (i.e., cold and iced-over) winter, the most open water is to be found here. In addition, and not insignificantly, five major power plants are also found in this zone that provide considerable amounts of forage for eagles in the form of entrained fish, making it a highly attractive wintering habitat for eagles. However, it should be noted that even well before any of these power-plants existed, large numbers of eagles were recorded in this same zone as far back as the late 1800s and early 1900s, indicating it has served as prime bald eagle wintering habitat for a long time. The bald eagle is still State-listed as threatened.

### **Threats and threats assessment:**

1. Modification or destruction of habitat(s) including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).
2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.
3. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for “death by a thousand cuts” effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.
4. Other man-made or natural factors including collisions with trains – in 2009, 10 (known) bald eagles were killed along the rail line along the Hudson River.
5. Ingestion of environmental contaminants, impacts to reproduction.

### **Research needed:**

- Identification of essential breeding and wintering habitats to target locations for habitat management and protection.

(WHO: NYSDEC, U.S. Geological Survey [USGS], New York Field Office, Southern New England/New York Bight [SNENYB])

## **Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area**

- Identification of movement patterns, migratory pathways and the locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This needs to include the heights at which eagles fly when riding thermals (in the vicinity of potential wind energy development sites) for both activity associated with breeding and migratory movements.

(WHO: USGS, USFWS Migratory Bird Office, Virginia Tech, Hawk Watch groups, wind energy developers)

- Monitoring contaminant levels in eagles within New York.

(WHO: NYSDEC, NYFO, USGS)

- Continued pathology investigations to determine causes of mortality in bald eagles.

(WHO: NYSDEC, National Wildlife Health Center, NYFO)

- Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed.

(WHO: permittees of BGEPA permit program, NYSDEC, ESA permittees)

### *Partners/potential funding:*

NYSDEC, New York State Energy Research and Development Authority (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers

### *Population goal(s) for New York State:*

Goal – productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population.

(WHO: NYSDEC)

## **CONSERVATION DESIGN**

### **1. Loss of habitat**

- a. Address modification or destruction of habitat(s) including winter roosting areas, and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.

## **Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area**

- b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding, foraging, and migratory routes.
  - c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats.
- 2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**
- a. Through hunter education programs, address nest protection programs.
  - b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.
  - c. Develop a strategy for addressing high levels of contaminants, if found.
- 3. Inadequacy of existing regulatory protections.**
- a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.
- 4. Other man-made or natural factors.**
- a. Address other factors including collisions with trains – (in 2009, 10 known bald eagles were killed along the high speed rail line along the Hudson River) – by developing a programmatic permit for take by the rail companies associated with their operations along the Hudson River Corridor. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles.
  - b. Address wind and rail related mortalities by improved intraoffice coordination on development of BMP and other strategies.
- 5. Ingestion of environmental contaminants, impacts to reproduction.**
- a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.
  - b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

# Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area

*Partner organizations:*

Ripley Hawk Watch, Onondaga Audubon Society, Cornell Lab of Ornithology, NYSDEC, Riverkeeper, Haudenosaunee Confederacy.

## CONSERVATION DELIVERY

### 1. Loss/degradation of habitat.

- a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs, and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.
  - i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc.
  - ii. [Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes \(Conservation Planning Assistance \[CPA\]\).](#)
  - iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting.
  - iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting, and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews.
  - v. [Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat \(CPA\).](#)
- b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats.
  - i. Obtain, prepare, and/or distribute maps outlining key areas for conservation to coworkers who may be reviewing projects in bald eagle habitat,.
  - ii. Assist coworkers in drafting language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats.

## **Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area**

- iii. Develop/tweak national guidelines for land management agencies to ensure that their trail systems minimize impacts to bald and golden eagles in concentration areas. Prepare guidelines, and distribute to State Parks, State Forests, and National Forests interpretation staff.
- 2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**
    - a. Through hunter education programs, address nest protection programs.
    - b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.
    - c. Develop a strategy for addressing high levels of contaminants if found.
- 3. Inadequacy of existing regulatory protections.**
    - a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office Migratory Bird Program office, and State protections under the State ESA.
- 4. Other man-made or natural factors.**
    - a. Address other factors including collisions with trains by developing a programmatic permit for take by the rail companies associated with their operations along the Hudson River Corridor.
      - i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles.
      - ii. Address wind- and rail-related mortalities by improved intraoffice coordination on development of BMP and other strategies.  
[Send letter to rail companies reminding them of need to pursue authorization of incidental take \(CPA\) \(for 2009, N=10\).](#)
      - iii. [Meet with new Northern BGEPA coordinator to discuss an approach to compliance \(CPA\).](#)
      - iv. [Meet with NYSDEC, Solicitor's Office-NE, Bald Eagle Coordinator, and Law Enforcement to strategize next steps, by mid-November 2010 \(CPA\).](#)
      - v. [By December 31, 2010, convene a multiparty meeting to discuss next steps with the rail companies and their attorneys \(CPA\).](#)



## **Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area**

- vi. Work with the NYSDEC, industry, other field offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors (CPA).
- 5. Ingestion of environmental contaminants, impacts to reproduction.**
    - a. Determine if there are impacts to bald eagles from environmental contaminants (EC) within the watershed and if so, implement mitigative measures.
      - i. Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment (NRDA); review bald eagle data and assess status of injury (EC).
    - b. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
      - i. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat (CPA) (2010-2013).
  - 6. Address disease or predation**, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs.
    - a. Investigate whether bald and golden eagle fact sheets could be provided at hunter training programs run by the NYSDEC. Develop fact sheets and distribute.
  - 7. Address inadequacy of existing regulatory protections** by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.
    - a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes.
    - b. Identify three organizations with whom we could meet to further BGEPA education – builders, outfitters, etc.

### **OUTREACH**

See specific examples, above

Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current (CPA).

### **MONITORING**

Development of protocols to measure progress/success.\

# Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area

Monitoring to measure progress/success.

Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles (CPA).

Investigate options for funding to assist the state with post-listing activities (CPA).

## References

Bull, J. and J. Farrand, Jr. 1977. *The Audubon Society field guide to North American birds*. Alfred A. Knopf, New York. pp. 468-469.

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[http://www.dec.ny.gov/docs/wildlife\\_pdf/baea2009.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/baea2009.pdf).

Nye, P. 1990. A second chance for our national symbol. *The Conservationist*. July/August 1990.

Nye, P. 1992. Winter Eagles. *The Conservationist*. January/February.

# **Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area**

## **Blanding's Turtle Species Action Plan**

### **FOCAL AREA: LOWER HUDSON**

#### *Other species benefitting:*

(shrub swamps/marshes/fens/vernal pool habitat) New England cottontail, bog turtles, black duck, wood duck, American woodcock, golden-wing warbler, spotted salamanders

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** The Blanding's turtle is a long-lived, late-maturing species that inhabits a wide range of habitats throughout its range, including shrub swamps, marshes, vernal pools, bogs, ponds, lakes, wet prairies, forested wetlands, and low-gradient streams and rivers. Blanding's turtles main range extends disjunctly from southeastern Ontario, adjacent Quebec, and southern Nova Scotia, south into New England, and west through the Great Lakes to western Nebraska, Iowa, and extreme northeastern Missouri. Several disjunct populations occur in the Northeast (eastern New York, eastern Massachusetts, southern New Hampshire, southern Maine, and southern Nova Scotia). These eastern populations have been effectively isolated from the main range for several millennia, are genetically distinct, and may qualify for Federal listing as a Distinct Population Segment under the U.S. Endangered Species Act (ESA). Blanding's turtles mature between 14-21 years, and can attain ages greater than 75 years and still reproduce successfully.

In addition, Blanding's turtles use uplands for several parts of their life cycle for nesting, moving among wetlands, basking, aestivation, and possibly feeding. Most individuals move overland (over 3 km) among multiple wetlands throughout the season. In addition, females often move long distances to nesting sites. Habitat, therefore, must be considered in the context of its landscape setting.

Because Blanding's turtles have a generation time of nearly 40 years and population increases take place slowly, recoveries from declines may take many decades or centuries. Therefore, to be effective, conservation efforts must take place well in advance of severe declines.

**Justification for species selection:** Blanding's turtles are State-listed as either threatened or endangered in nine of 15 states where they occur, including three of the four states in the Northeast. In New York, the Blanding's turtle is State-listed as threatened. At the Federal level, the species is not currently listed under the U.S. Fish and Wildlife Service (USFWS) ESA; under the Canada Species at Risk Act, the species is considered threatened (endangered in Nova Scotia).

**State contribution to overall species population:** In New York, Blanding's turtles are known from the following counties: Dutchess, Saratoga, St. Lawrence, Jefferson, Niagara, and Erie.

## **Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area**

Evidence suggests there are 3 evolutionary significant units (ESU) for Blanding's turtles across their range. Two of these units occur in New York – the St. Lawrence/western New York populations and those populations in the Hudson River basin. It is likely that there would be a minimum of two recovery units established in New York, if the species is Federally-listed. With two ESUs, it could be stated that New York's Blanding's turtle population is genetically more diverse than any other State.

### **Threats and threat assessment:**

Threats<sup>16</sup> (see Status Assessment in references):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).
- B. Fragmentation of habitat (connectivity of wetland and upland habitat).

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

#### **Factor C. Disease or predation:**

- A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

#### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

#### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

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<sup>16</sup> Refers to 5 listing factors A-E in Section 4 of ESA.

# **Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area**

## ***Recovery Goals***

### ***Conservation goal(s) for New York State:***

The New York State Department of Environmental Conservation (NYSDEC) is currently writing a Blanding's Turtle Recovery Plan. Although no population goals have been established for New York, the New York Field Office (NYFO) will continue to collaborate with partners to establish target population goals. Empirically determining the status and trends of Blanding's turtles is difficult; this is the result of sparse data and a long generation time for the species. In general, trends must be inferred based upon the species life history and condition/trends of habitat.

### **Research/Actions needed:**

- Extensive surveys to assess known sites and identify new populations.

(Who: NYSDEC, Hudsonia Ltd, New York Natural Heritage Program [NYNHP] State University of New York-Potsdam [SUNY-Potsdam], USFWS; Cost: unknown at this time)

- Conduct genetic analyses needed to address Distinct Population Segment issue before species can be considered for listing.

(Who: NYSDEC, U.S. Geological Survey [USGS], Hudsonia Ltd, NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

- Conduct study on road designs to reduce adult mortality (underpass or overpass designs, crossing signage).

(Who: NYSDEC, USGS, University of Massachusetts (UMass), Federal Highway Administration [FHWA], New York State Department of Transportation [NYSDOT], Hudsonia Ltd., NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Status Assessment - 2007
- Nova Scotia Recovery Plan – 2003
- Quebec Recovery Plan – 2005

In addition, the NYSDEC is developing a Blanding's turtle recovery plan for New York State (A. Ross).

# Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Assist with development/review of New York State Recovery Plan.

Recovery Plan is currently being drafted by NYSDEC.

- B. Assist with development/review of Northeast Blanding's Turtle Conservation Initiative.

Northeast States recently applied for FY10 multi-state wildlife grant to develop a conservation plan for Blanding's turtles in the northeast region of the United States and initiate implementation of the plan.

- C. Determine potential role with New England Field Office (NEFO)/NYSDEC.

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).
- B. Fragmentation of habitat (connectivity of wetland and upland habitat).
  - 1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.
    - a. Draft standard language and compile materials to share with the public (Endangered Species [ESA]).
    - b. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(Conservation Planning Assistance \[CPA\]\).](#)
  - 2. Develop standard avoidance and minimization measures for development projects.
    - a. Develop standard guidelines to minimize development impacts to the Blanding's turtle (ESA).
    - b. Educate local government/townships of presence of the species and provide recommendations regarding development guidelines to reduce impacts.

## **Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area**

3. Target wetland mitigation projects, including vernal pool creation/restoration.
  - a. Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species (CPA).
4. Work with NYSDOT and FHWA to reduce road mortality.
  - a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA).
5. Work with partners to proactively protect the complexes of wetlands and uplands used by extant populations.
  - a. Work to ensure information on known locations of Blanding's turtles is conveyed to land protection partners and land trusts to focus their efforts (ESA).
6. Participate in New York State Recovery Plan and Conservation Initiative meetings.
  - a. Attend and provide input at NYSDEC Recovery Plan meetings as requested. Assist NYSDEC with development of best management plans (BMP), threats assessment, and mitigation strategies as requested. (ESA)
  - b. Provide USFWS support for 2011 multi-state State Wildlife Grant (SWG) Blanding's turtle proposal submission, with a priority given to the population genetics research, as requested (ESA).
7. Assist with NYSDEC surveys.
  - a. Coordinate with the NYSDEC and Hudsonia to determine survey schedule. (ESA/NYFO).

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.
  1. No work identified at this time.

### **Factor C. Disease or predation:**

- A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

# **Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area**

1. No work identified at this time.

## **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.
  1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.
    - a. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(CPA\).](#)

## **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).
  1. Identify potential effects to the Blanding's turtle from climate change.
    - a. Work with National Weather Service to create models for determining climate change impacts to the Blanding's turtles.
    - b. [Prepare expedited pre-assessment document to determine whether Hertel Landfill \(National Priorities List \[NPL\] Site\) poses threats to trust resources and opportunity exists for Natural Resource Damage Assessment and Restoration \(NRDAR\) work \(EC\).](#)
    - c. [Prepare expedited pre-assessment document to determine whether Harbor at Hastings NPL Site poses threats to trust resources and opportunity exists for NRDAR work \(EC\).](#)

## **OUTREACH**

Develop education and outreach tools – on land protection needs and conservation restriction options for landowners, on turtles crossing roads, on turtles as pets, on life history strategy, and on nesting turtles.



# Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

## MONITORING

- Work with partners to review and track recovery progress.
- Establish benchmarks for success based on New York State Blanding's turtle Recovery Plan (pending).

### *Partners*

NYSDEC, NYSDOT, FHWA, USGS, NYNHP, USFWS/NEFO, Hudsonia Ltd., Wilton Wildlife Preserve and Park, The Nature Conservancy (TNC), UMass, SUNY-Potsdam, land trusts, adjacent States

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# **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area**

## **Bog Turtle Species Action Plan**

### **FOCAL AREA: LOWER HUDSON**

### **BIOLOGICAL PLANNING**

#### *Other species benefitting:*

spotted turtle, fen plant communities, Indiana bat, New England cottontail

#### *Introduction to species*

**Species information:** Bog turtles often hibernate communally with other bog turtles and with spotted turtles. The bog turtle emerges from hibernation which is often spent in an abandoned muskrat lodge or other burrow, by mid-April when both the air and water temperatures exceed 50°F. Sexual maturity may be reached between 8-11 years old. Mating occurs in the spring (primarily) or fall, and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest (tussocks). The eggs hatch around mid-September and the adults enter hibernation in late October. Bog turtles live for 30 years or more in wetland (fen) communities and may use adjacent upland areas. Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

**Justification for species selection:** The bog turtle was Federally-listed as threatened in 1997 and listed as endangered by the State of New York. The bog turtle is a U.S. Fish and Wildlife Service (USFWS) Spotlight Species and Region 5 of the USFWS has a new bog turtle initiative.

**State contribution to overall species population:** There are 2 Recovery Units (RU) in New York, the Prairie Peninsula/Lake Plain RU (New York has all known extant sites) and the Hudson Housatonic RU (HHRU).

#### **Threats and threat assessment:**

Threats<sup>17</sup> (See 5-year review for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Residential and commercial development continues to be a leading cause of habitat loss and degradation. Most direct effects to bog turtles and their habitat are now avoided. Indirect effects to wetlands remain.

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<sup>17</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

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### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collection is an ongoing threat.

### **Factor C. Disease or predation:**

- A. New concerns about potential disease issues in New York and Massachusetts.
- B. Predation is a threat at certain sites.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Continues to pose a threat.

### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Beaver use of sites, weather events (flooding, drought).
- B. Climate change may or may not be a threat to the species.
- C. Invasive species.

### ***Recovery Goals***

***Range-wide Recovery Goals/Objectives:*** Protect and maintain the northern population of this species and its habitat, enabling the eventual delisting of the species.

***Conservation goal(s) for New York State:*** Long-range protection is secured for at least 40 viable populations in HHRU, including at least 10 populations in each of the following recovery subunits: the Wallkill River, the Hudson River, and the Housatonic River.

### **Research/Actions needed:**

- A. Coordinate with Pennsylvania Field Office (PAFO), New Jersey Field Office (NJFO), New England Field Office (NEFO), and partners on goal for New York for HHRU subunits (FY2011) (Endangered Species [ESA]).
- B. Conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4).
  1. Recommend surveys during project reviews (annually, FY2011-2013, New York Field Office (NYFO) ESA, Conservation Planning Assistance [CPA]).
  2. Conduct proactive surveys to locate additional populations (ESA).
    - a. Complete grant agreement for contractor (Tesauro) (FY2011, NYFO ESA).

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- b. [Manage grant agreement \(FY 2011, NYFO ESA\).](#)
  - c. [Apply for additional funding \(ESA\).](#)
- C. Monitor status of and threats to extant populations (Recovery Actions 3.5 and 6.1).
- 1. Monitoring of potential new disease is needed.
  - 2. Conduct bog turtle surveys at extant sites.
    - a. Develop a schedule and assign monitors to adopt a site (FY2012, NYFO ESA).
- D. Develop a strategy for evaluating bog turtle populations and managing those populations (where necessary) (Recovery Action 7.1).
- 1. State University of New York-College of Environmental Science and Forestry (SUNY-ESF) is developing population estimates for Perry Preserve.
    - a. [Meet with SUNY-ESF to learn more about developing population estimates for Perry Preserve \(FY2011\) \(ESA\).](#)

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan completed 2001 (Service 2001)
- 5-year review drafted 2008 (Service 2008)
- Spotlight Species Action Plan 2009 (Service 2009)
- National Fish and Wildlife Foundation (NFWF) Business Plan (NFWF 2009)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. [Participate in Bog Turtle Initiative \(ESA\).](#)
  - 1. [Participate in conference calls \[ongoing\].](#)
  - 2. Attend March 10, 2010, meeting [completed FY2010].

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3. Assist Alison Whitlock in planning and convening next workshop (FY2011).
- B. In each recovery unit, identify and prioritize sites for appropriate conservation efforts (Recovery Action 2.1).
1. Initiate HHRU recovery implementation team.
    - a. Hold initial call/meeting to reinvigorate Hudson/Housatonic team (FY2011) (ESA).
  2. Complete 1-3 year implementation plan for Hudson, Housatonic, and Wallkill recovery subunits by August 1, 2011 (ESA).
  3. Develop site-specific management plans for each priority site.
- C. Conduct research/studies to understand and identify the degree to which land-use activities alter bog turtle habitat (Recovery Action 6.2).
1. Conduct research to help understand indirect effects such as hydrological changes from residential and commercial development.
    - a. Request U.S. Geological Survey (USGS) Science Support Partnership (SSP) funding through Fish and Wildlife Information and Needs Studies (FWINS) posting.

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Protect bog turtle sites through purchase and conservation easements (Recovery Action 2.3).
1. Provide technical assistance to partners that may be able to protect sites (Recovery Land Acquisition grant, New York State Department of Environmental Conservation [(NYSDEC) Environmental Protection Fund [EPF], The Nature Conservancy [TNC], or land trusts).
    - a. Coordinate with land trusts.
    - b. Provide technical assistance to Natural Resources Conservation Service (NRCS) on Wetlands Reserve Program (WRP) projects.

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- i. Meet with NRCS on status of projects and plans (FY 2011) (ESA).
    - c. Target Section 404 mitigation projects.
  - B. Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting activities in wetlands (Recovery Action 1.2) and avoid and minimize direct and indirect adverse effects to bog turtles and their habitat (Recovery Action 1.3).
    - 1. Develop standardized avoidance, minimization, and compensation measures (AMM).
      - a. Pipelines.
        - i. Utilize materials on pipelines (AMM's, best management practices [BMP]) from NiSource Habitat Conservation Plan [HCP] to develop pipeline factsheet (FY2011) (ESA).
        - ii. Post BMP on website (FY 2011) (IT).
      - b. Marcellus shale drilling.
        - i. Assess potential threat – coordinate with PAFO.
      - c. Residential/Commercial Development.
        - i. Develop standardized exposure/response table and narratives to explain threats.
    - 2. Identify opportunities to add features promoting bog turtle conservation for Clean Water Act (CWA) section 404 compensatory mitigation permit requirements for development projects in counties with bog turtle populations, and
    - 3. Once identified, provide substantive comments on measures to avoid and minimize direct and indirect effects, including those effects associated with development that originate in uplands.
  - C. Coordinate with New York State Department of Transportation (NYSDOT) to address potential problems with culverts/crossings at sites.
    - 1. Attend site visit (FY2011, NYFO ESA, Partners for Fish and Wildlife [PFW]).
    - 2. Determine any funding needs.

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

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- A. Monitor potential collection at Perry Preserve (NYFO ESA, Law Enforcement, TNC).

### **Factor C. Disease or predation:**

- A. Assist with health assessment with Wildlife Conservation Society (WCS) (ESA).
  - 1. Fund project with NEFO (Who: NYFO ESA) [completed FY 2010].
  - 2. Assist with field collection of samples in coordination with NEFO (FY2011, NYFO ESA, RO ES, NEFO).
  - 3. Provide grant oversight (FY2011, NYFO ESA).

**Factor D. The inadequacy of existing regulatory mechanisms:** No work planned in next 2-3 years.

**Factor E. Other natural or manmade factors affecting its continued existence:** Control invasive species, especially *Phragmites australis*, monotypic stands of *Typha* spp., and *Lytrum salicaria* (purple loosestrife).

- A. Manage, restore, and maintain bog turtle habitat, as appropriate (Recovery Action 6.4) and control succession and invasive exotic plants (Recovery Action 6.3.1).
  - 1. Continue habitat restoration projects in focused areas. (ESA and PFW).
    - a. Meet with NRCS, TNC, and NYSDEC to determine how USFWS can best assist in FY2011-2013.
    - b. Provide technical assistance to NRCS (review site plans, ensure consistency with NRCS BO) as requested (annually, NYFO ESA).
    - c. Assist with habitat restoration projects (e.g., fence installation, woody vegetation removal) as NRCS Wetland Reserve Program (WPR) cost-share or Partners stand-alone projects (Who: NYFO PFW, t/e funding).
    - d. Fund Jason Tesauro to continue landowner outreach, surveys, development of site plans, and monitoring (see above) (Who: Service, cost \$22,000) (FY 2010 end of year).
    - e. 1 project confirmed; 2 more in planning.
    - f. Explore an NRCS or coastal/partners cost-share position at NYFO (Who: NYFO).

## **OUTREACH**

## **Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area**

Current ideas include:

- Update website with BMPs.
- Target nature centers located in the RU and research the need for educational opportunities.
- Design outreach exhibit to inform the public on bog turtle life history, threats (including Climate Change), avoidance, minimization, and conservation measures.

### **MONITORING**

Review and track recovery progress.

Monitor vegetation and turtle response at restoration projects (Environmental Defense [ED], NRCS, and SUNY-Purchase).

#### *Partners*

NYSDEC, New York Natural Heritage Program (NYNHP), ED, NRCS, TNC, NYSDOT, U.S. Army Corps of Engineers (USACE), Columbia County Land Trust, Dutchess County Land Conservancy

#### *References*

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2008. Draft Bog Turtle Northern Population 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, State College, Pennsylvania

U.S. Fish and Wildlife Service. 2009. Draft Spotlight Species Action Plan.



# Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

## Dwarf Wedgemussel Species Action Plan

### FOCAL AREA: LOWER HUDSON HOUSATONIC

#### *Other species benefitting:*

Bottom-dwelling fish host species; tessellated darter and mottled sculpin and other mussels

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The dwarf wedgemussel (DWM) is a Federally-listed endangered species and a New York State-listed endangered species. This mussel is sexually dimorphic; however, the dimorphism is very subtle and routine determination of sex in DWM is difficult. DWM live embedded in the fine sediment that has accumulated between cobbles in slow to moderate current and relatively shallow water (40 cm) in small cool water rivers and similar habitat in larger rivers in New York (New York National Heritage Program [NYNHP]).

Fish hosts for DWM are small, bottom-dwelling fish, such as the tessellated darter and the mottled sculpin. The darter and sculpin glochidial host fish species are generally pollutant sensitive taxa and a healthy fish assemblage is critical to viable mussel populations. The glochidium receives little nutrition from the fish, but uses it for dispersal. After several weeks, the glochidium detaches itself from the unharmed fish and drops to the river bottom. It is then a juvenile mussel.

Many mussels have life spans that range upwards of 20, 30, or even 100 years. The DWM appears to only live about 10 years. Adults must, therefore, be constantly replaced to maintain a viable population.

**Justification for species selection:** The DVM is State- and Federally-listed as endangered. This mussel was once found at 70 locations in 15 major Atlantic Coast drainages. DWM is discontinuously distributed along Atlantic seaboard drainages from New Hampshire to North Carolina (New Hampshire [NH], Vermont [VT], Connecticut [CT], New York [NY], New Jersey [NJ], Pennsylvania [PA], Massachusetts [MA], Maryland [MD], Virginia [VA], and North Carolina [NC]). Numbers have declined drastically; most populations that remain number in the 100s. The two exceptions are the lower Neversink River in Orange County, where there were at one time, at least ten thousand dwarf wedge mussels, and the Tar River in North Carolina. In New York, extant DWM's are only known to occur in the Neversink River and East Branch of the Delaware River; however, additional surveys are needed. For example, a specimen was recently discovered in the Weatuck Creek in Dutchess County, New York.

**State contribution to overall species population:** Historically known from about 70 locations in 15 major drainages, it was listed as a Federally endangered species in the United States in 1990. When the Federal recovery plan was published three years later, the dwarf wedgemussel

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was known to exist in only 20 of 70 locations where it had originally been known to occur. Most of the populations were thought to be small and declining. Since the Federal recovery plan was published in 1993, surveyors have found nearly 40 new populations in locations where the species had been presumed extirpated or in rivers where the species had never been found (Nedeau 2005). The only two known populations occur in the upper Delaware River in Sullivan and Delaware Counties and one of its major downstream tributaries, the lower Neversink River in Orange County. It is an important part of species distribution.

### **Threats and threats assessment:**

Threats<sup>18</sup> (See 5-year review for full assessment):

#### **Factor A. Destruction, modification, or curtailment of its habitat or range:**

- A. Direct impacts from impoundments and linear crossings (pipelines)
- B. Indirect impacts from water quality including agriculture, pollution (industrial, agricultural, and domestic), and excess sediment.
- C. Review water quality standards for contaminants (copper, ammonia)

#### **Factor B. Disease or predation**

- A. Some site-specific impacts to small populations are possible (i.e., muskrats)

#### **Factor C. Other natural or manmade factors affecting its continued existence:**

- A. Competition with exotic bivalves, both the Asian clam (*Corbicula fluminea*) and zebra mussel (*Dreissena polymorpha*), could pose a threat because they are expected to eventually invade all of New York's watersheds, although neither has yet invaded the upper Delaware system (Strayer and Ralley 1991).
- B. Flooding has been a severe problem in the Delaware River drainage.
- C. Climate Change: The Neversink River water levels are expected to rise due to an increase in precipitation (rain more so than snow), which would increase volume, velocity, and temperature of the water. Stream morphology, dimension, pattern, and profile may change river dynamics. Habitat loss and mortality would be expected if changes were severe.

### ***Recovery Goals***

#### ***Range-wide Recovery Goals/Objectives:***

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<sup>18</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area**

Maintain and restore viable populations of DWM to a significant portion of its historical range in order to remove the species from the Federal list of endangered and threatened species. In order to reclassify the DWM as threatened from endangered, this criterion must be met:

- The following populations of the DWM must be shown to be viable (a population containing a sufficient number of reproducing adults to maintain genetic variability, and annual recruitment is adequate to maintain a stable population): Mainstem Connecticut River (NH/VT), Ashuelot River (NH), Neversink River (NY), Upper Tar River (NC), Little River (NC), Swift Creek (NC), Turkey Creek (NC), and six other rivers/creeks representative of the species' range.

*This criterion has been partially met.*

Viable populations have been found in the mainstem Connecticut River and Ashuelot River. In order to remove the DWM from the Federal list, the following additional criteria must be met:

- At least 10 of the rivers/creeks in Criterion 1 must support a widely dispersed viable population so that a single catastrophic event in a given river will be unlikely to result in the total loss of that river's population.
- The rivers in Criterion 2 should be distributed throughout the species' current range with at least two in New England (NH, VT, MA, CT), one in New York, and four south of Pennsylvania.
- All populations referred to in Criteria 1 through 3 must be protected from present and foreseeable anthropogenic and natural threats that could interfere with their survival.

*These criteria have not been met, and in some cases have become irrelevant, see 2007 5-year review.*

### ***Conservation goal(s) for New York State:***

The Neversink River population has apparently declined by 75% since it was first located in 1990 when it dropped from an estimated 80,000 individuals to 50,000 in 1991, then to 20,000 in 1994. It is not known if the population still numbers in the tens of thousands since the last survey over a decade ago. Since these population estimates are based on the direct capture of only a small number of individuals and standardized monitoring methods have only recently been adopted for Unionids, the estimates may not be accurate, nor directly comparable. The short-term trend for the Delaware River (meta) population is not known at this time because the sites have not been monitored since they were first located by U.S. Geological Survey (USGS) researchers in 2000 (NYNHP).

Neversink is an important river for the conservation of DWM (see criterion 1).

# Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

## Research/Actions needed:

- Confirmation of host fish(es) in the Delaware and the Neversink Rivers, diet, age, and growth, and mortality factors.
- Details about habitat requirements (current speed, water depth, substrate grain size, substrate stability, water temperature, and water quality factors) also need work.
- Define viable population.
- Additional presence/absence surveys are needed to find new sites.
- Genetic work.
- Identify barrier removal opportunities.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for existing strategies:

- Federal recovery plan 1993
- 5-year review completed 2007

Note that the 5-year review recommended a revision of the recovery plan.

Assist the New England Field Office (NEFO) with revision when initiated.

## Research/Actions needed:

- Conduct life history studies and identify ecological requirements of the species (U.S. Fish and Wildlife Service [USFWS] 1993).
- Preserve DWM populations and occupied sites (USFWS 1993). Locate and prioritize stream reach with known locations for long-term protection.
- Reduce alterations to the natural flow caused by the upstream Neversink Reservoir Dam (NYNHP). Work with Delaware River Basin Commission (DRBC) on water level regulation (Pennsylvania Field Office [PAFO] lead).
- Evaluate outcome of this management strategy on the mussel populations (NYNHP).
- Reintroductions may be needed to bring low-density populations back up to viable levels and re-establish populations extirpated from certain rivers (USFWS 1993).
- Monitor population levels and habitat conditions (USFWS 1993).
- [Assist with development of measures for NiSource Habitat Conservation Plan \[HCP\]. \(Endangered Species \[ESA\]\)](#)
- [Develop conservation framework, including standard conservation measures, for bridge projects. \(ESA\)](#)

## CONSERVATION DELIVERY

# **Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area**

On-the-ground actions using strategies to address threats FY2010-2012

Recommendations for specific recovery actions from 5-year review:

1. Identify high priority populations needed for the recovery of the species (if recovery plan revision does not proceed quickly).
2. Develop habitat protection strategies for high priority populations.
  - a. Coordinate with The Nature Conservancy (TNC), New York State Department of Environmental Conservation (NYSDEC), and USGS to determine options for Neversink population
3. Encourage and support publication of gray literature in peer-reviewed journals.
4. Develop accurate fact sheets for the DWM (outreach).
5. [Assist with development of measures for NiSource HCP \(2011\). \(ESA\)](#)
6. [Develop conservation framework, including standard conservation measures, for bridge projects \(2011\). \(ESA\)](#)
7. Programmatic consultations with Federal Highway Administration (FHWA)/U.S. Army Corps of Engineers (USACE) (2011). (ESA)
  - a. Programmatic assessment of impacts to mussels from crossings (pipeline, bridges, culverts). Develop matrices and conservation measures.
8. [Obtain final USGS East Branch Delaware River Report \(2011\). \(ESA\)](#)

In addition, surveys are needed in the Webatuck drainage (Dutchess County)

- Request funding for surveys (2010) (completed)
- Complete grant agreement (2010) (completed)
- Grant oversight (2010) (completed)
- Review final report (2010) (completed)
- Geographic Information System (GIS) mapping of potential habitat (New York Field Office [NYFO] 2010 completed)
- Evaluate impacts to Neversink and Delaware from water regulation and gas drilling (2011-2012).

## **OUTREACH**

Design and construct a mussel/aquatic invertebrate exhibit to add to the Outreach Strategic Plan.

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Attend events at nature centers/festivals to educate the public on the importance of mussel species in New York.

Develop fact sheet on DWM and other mussels, salamanders, and other aquatics (2012).

### MONITORING

Recommendations for specific recovery actions from 5-year review:

1. Complete population genetic analyses, determine correct taxonomic nomenclature (USGS, 2013-2015, \$10,000).
2. Complete ongoing state-wide population surveys in North Carolina and Virginia, assess population status in these states.
3. Resurvey Neversink and Delaware Rivers to assess impacts from severe flooding in 2005 and 2006 and establish new baselines for future comparison.
  - *Delaware surveys ongoing - funded USGS in 2009*
  - Request funding for additional surveys (USGS 2012 cost estimate \$5,000)

### *Partners*

USGS, TNC, NYSDEC, NYNHP

### *References*

NYNHP. DWM website <http://acris.nynhp.org/guide.php?id=8375&part=1>  
Dwarf wedgemussel Recovery Plan. 1993. <http://www.fws.gov/northeast/nyfo/es/dwm.pdf>  
Dwarf wedgemussel 5 yr review. 2007.  
[http://www.fws.gov/newengland/pdfs/DwarfWedgemussel\\_5yrreivew.pdf](http://www.fws.gov/newengland/pdfs/DwarfWedgemussel_5yrreivew.pdf)

# Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

## Indiana Bat Species Action Plan

### FOCAL AREA: LOWER HUDSON RIVER

#### *Other species benefitting:*

eastern small-footed, little brown, tri-colored, northern, big brown, bog turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h. Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at <http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf>.

Streams associated with floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (e.g., old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (Service 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

**Justification for species selection:** The Indiana bat is Federally- and New York State-listed as endangered. The NYFO has the R5 species lead.

**State contribution to overall species population:** New York used to have ~11% of wintering I bats rangewide before White-nose syndrome (WNS). NY still has the largest number of wintering (and likely summering) Indiana bats in the region. There are draft recovery units and NY is part of the northeast recovery unit.

#### **Threats and threat assessment:**

## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

Threats<sup>19</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** *See the Plan for in-depth discussion (Service 2007, page 71).*

- A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) has been identified as a long-standing and ongoing threat to the species.
- B. Winter – potential to impact hibernacula with gas drilling, filling, etc.
- C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development
- D. Fall (swarming) – same pressures as spring/summer habitat

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** *See the Plan for in-depth discussion (USFWS 2007, page 80).*

- A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

**Factor C. Disease or predation:**

- A. WNS is most significant threat in New York. Predation is also a threat.

**Factor D. The inadequacy of existing regulatory mechanisms:** *See the Plan for in-depth discussion (USFWS 2007, page 90).*

- A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

**Factor E. Other natural or manmade factors affecting its continued existence:** *See the Plan for in-depth discussion (USFWS 2007, page 91).*

- A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.
- B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and PCBs), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and

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<sup>19</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act



## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

climate change.

### *Recovery Goals*

**Range-wide Recovery Goals/Objectives:** Intermediate- reclassification, Long-term- delisting

### **Conservation goal(s) for New York State:**

The Draft Recovery Plan does not have specific criteria for NY. However, NY has several P1 and P2 hibernacula and there are criteria for protecting 80 % of P1 hibernacula in each Recovery Unit.

### **Research/Actions needed:**

- A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions- not included in recovery plan- WNS will eventually have a separate plan).
- B. WNS-related research is needed to better understand the threat.
  - 1. Assist with RFPs as requested (ESA)
  - 2. Review proposals if requested to be on review team (ESA)
  - 3. Provide grant oversight for FY08 and FY09 projects (FY2011-2012) (ESA)
  - 4. Assist with field work (FY2011). (ESA)
- C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6).
  - 1. Assist with Ibat modeling SDM effort until completion (NYFO ESA)
    - a. Respond to data requests from USGS and R3 (FY11)
    - b. Participate in calls during Beta testing (FY11)
    - c. Attend workshop to test model (FY11)
    - d. Assist with role out of model (FY11)
    - e. Provide TA to FOs with use of model (FY11,12)
- D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4).
  - 1. Send all samples out for analysis (FY11, EC)

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (Service 2007)
- Last 5-year review completed 2009 (Service 2009)

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. [Assist R3 with finalizing Recovery Plan as requested \(FY11, NYFO ESA\)](#)
- B. Reduce current threats at known hibernacula (primarily WNS-related actions- not included in recovery plan- WNS will eventually have a separate plan) (Recovery Action 1.1.1)
  1. WNS National Plan
    - a. [Provide technical assistance during FWS and/or public review periods \(FY2011\) \(ESA\)](#)
    - b. [Participate in Communications Group \(FY2011,12,13, NYFO ESA\)](#)
  2. WNS-related research is needed to develop conservation strategies to respond to WNS.
    - a. [Assist with captive bat management structured decision making process \(FY10, 11, NYFO ESA\)](#)
- C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.
  1. [Participate in multi-region project to develop guidance \(FY10,11, NYFO ESA\)](#)
  2. Coordinate first R3, R4, R5 t/e wind call- 2/3 (FY10)[completed]
  3. [Participate in multi-region calls \(FY10 and beyond\) \(ESA\)](#)
- D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)
  1. Assist R3 with this effort
- E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)
- F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)

## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

1. Assist with funding automation of acoustic survey data analysis
    - a. participate in Regional WNS funding discussions and promote funding by FY10 Congressional pot (FY10,11)
    - b. assist with grant agreement (FY10)[completed]
  2. Determine whether netting guidelines should be revised to include acoustic detectors
    - a. Participate in Ibat/Wind Initiative protocol workgroup (FY10)[completed]
    - b. Participate in protocol team as requested (FY11)
- G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)
1. Fund or otherwise coordinate wind project research
    - a. Flight altitude?
    - b. Migratory pathways?
    - c. Impacts of wind turbines on resident v. migrating bats?
    - d. Minimization/mitigation measures?
    - e. Post-construction monitoring techniques?
- H. Regional coordination role
1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads (FY11) (ESA) Potential outcomes:
    - a. Provide updates to FOs on literature, information from other regions
    - b. Provide technical assistance to FOs on formal consultations/HCPs
    - c. Provide R5 comments on national issues (e.g., survey protocol updates)
    - d. Provide R5 end-of-year reporting info to R3
    - e. Maintain understanding of current literature
    - f. Participate in WNS-related projects as needed

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)

## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

- B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)
- C. Encourage habitat protection through acquisition/easements
  - 1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants
  - 2. Provide technical assistance to NRCS for potential easements
- D. Minimize adverse impacts to Ibat during project reviews (Recovery Action 2.6)
  - 1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor
    - a. Review annual reports from
      - i. Adams Fairacre Farms (FY11,12, NYFO ESA)
  - 2. Habitat protection through informal and formal consultations and HCPs.
    - a. Assist with development of measures for NiSource HCP (ESA)
    - b. Develop conservation framework, including standard conservation measures, for residential and commercial projects (ESA)

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

**Factor C. Disease or predation:** Need to determine what conservation measures will be available for WNS-response.

**Factor D. The inadequacy of existing regulatory mechanisms:** Review NYSDEC permit conditions (FY11) (ESA)

### **Factor E. Other natural or manmade factors affecting its continued existence:**

## **OUTREACH**

- A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat, including development of guidelines, best management practices, land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)
- B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)

## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

1. Current Indiana bat/WNS display
    - a. Continue to rotate display at nature center (any NYFO program)
    - b. Update display at least once/year (ESA)
  2. New Indiana bat display
    - a. Provide technical assistance to the USFS in the development of a new display (ESA)
    - b. Receive transfer funding from USFS and develop contracts to complete display (FY2011, Cost:\$10-15,000 [\$5,000 from USFS, rest from WNS and NYFO]) (ESA)
  3. New Indiana bat cave display
    - a. Develop new cave display (FY2012, Cost: \$1000)
  4. Attend meetings/workshops
- C. Use Service websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)
1. Update fact sheets and web materials (NYFO and R5) (FY10,11)
- D. Assist with FOIA responses as needed

### MONITORING

Survey winter populations of I bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

- A. Assist NYSDEC with 2010 hibernacula surveys (FY10)[completed]
  1. Graphite
  2. Barton Hill
  3. Williams Complex
- B. Assist NYSDEC with “Ibat on year” winter 2010-2011 surveys (FY11) (Who: NYFO, staff costs) (ESA)

Review and track recovery progress.

*Partners*

## Indiana bat (*Myotis sodalis*): Lower Hudson Focal Area

NYSDEC, R3, R4, R5 FOs, NYSDOT, FHWA, USGS, Hudsonia, TNC

### *References*

U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 600 pp. (This document has been peer-reviewed and is available at <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Bloomington, IN.

# New England cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

## New England Cottontail Species Action Plan

### FOCAL AREA: LOWER HUDSON

### BIOLOGICAL PLANNING

#### *Other species benefitting:*

American woodcock, golden-winged warbler, blue-winged warbler, brown thrasher, common nighthawk, ruffed grouse, whip-poor-will

#### *Introduction to species*

**Species information:** The New England cottontail (NEC) is New England's only native cottontail rabbit. The NEC populations historically occurred throughout the New England states and eastern New York and have declined dramatically in recent decades due to habitat loss and fragmentation resulting from land use change; habitat loss continues within its currently limited range. The NEC is a Species of Greatest Conservation Need (SGCN) in all seven states in its range, and a Candidate Species for Federal listing under the Endangered Species Act (ESA). The NEC requires thicket habitat and is frequently associated with shrublands and early successional forests. Studies show that the NEC's mortality rate is twice as high on patches smaller than 6 acres than it is on patches over 12 acres. On small patches, the habitat may provide insufficient food to support the cottontails throughout the winter. In these conditions, NECs either starve or risk predation in search of food outside the safety of dense cover. Habitat blocks of at least 25 acres in size (ideally much larger) and close to additional patches of habitat are necessary for the species to survive. (Arbuthnot 2008).

**Justification for species selection:** The NEC is a Federal candidate (since 2006) for listing and is a New York State Species of Concern. It is also a U.S. Fish and Wildlife Service (USFWS) Spotlight Species. There is a 2007 Memorandum of Understanding among the Natural Resources Conservation Service (NRCS), USFWS, and Association of Fish and Wildlife Agencies to strengthen cooperation to conserve at-risk species and prevent their need for future listing under the ESA. Among the highest priorities in the New York Comprehensive Wildlife Conservation Strategy in 2009 is a Private Landowner Management Program for shrubland species, including NEC. There is a National Fish and Wildlife Foundation Keystone Initiative for the NEC. The NRCS has secured "special project" funding for NEC conservation activities.

**State contribution to overall species population:** Currently unclear. Working with New England Field Office (NEFO) and State partners to determine how many populations/acres we should target in New York.

#### **Threats and threat assessment:**

Threats<sup>20</sup>:

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<sup>20</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **New England cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area**

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Habitat succession
- B. Residential and commercial development

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Limited hunting

**Factor C. Disease or predation:**

- A. Numerous diseases affect cottontail rabbits, but no information to suggest this is a significant threat.
- B. Predation is a significant threat, particularly because current patches are insufficient to provide adequate cover and food. Common predators include coyotes, red foxes, bobcats, fishers, domestic cats, and owls.

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Ongoing threat.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Invasive species.
- B. Eastern cottontail competition.
- C. White-tailed deer competition.
- D. Weather.
- E. Road-kill.

### ***Conservation Goals***

***Range-wide Conservation Goals/Objectives:*** The 2009 Spotlight Species Action Plan goal is to reduce listing priority number from 2 to 8 by 2012. The ultimate goal of the USFWS is to preclude the need to list the NEC.

Population and/or habitat goals are not developed yet.



## **New England cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area**

**Conservation goal(s) for New York State:** Long-term goals are not developed yet. 2011 NRCS goal for New York is 40 acres entered into the Wildlife Habitat Incentive Program (WHIP).

### **Research/Actions needed:**

- Develop range-wide Conservation Strategy.  
  
Participate in Steering Committee.  
Assist NEFO with development of Strategy upon request.
- Develop New York conservation goals using predictive modeling from the State Wildlife Grant Program (SWG) projects as starting point (ES)
- Conduct additional surveys to better understand current range of NEC in New York.  
  
Assist New York State Department of Environmental Conservation (NYSDEC) with pellet collection (FY 2011, New York Field Office (NYFO) Endangered Species [ES]).  
Assist NYSDEC with pellet analysis.

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Spotlight Species Action Plan completed in 2009 (Service 2009)
- Landowners Guide to Habitat Management (Arbuthnot 2008)

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Participate in multi-state SWG project and NEC USFWS Initiative.
  1. Range-wide efforts (all items are ES)
    - a. Participate in monthly calls (FY2010, FY2011, FY2012)
    - b. Participate in steering committee calls/meetings
    - c. Assist with development of range-wide conservation strategy
    - d. Review products from SWG grant
  2. New York efforts

## **New England cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area**

- a. Attend New York kick-off meeting October 2009 (completed)
  - b. Assist with development/review of focus area maps (FY2010, FY2011) (ES)
  - c. Hold joint New York bog turtle/NEC initiative meeting June 2010 (completed)
  - d. Develop goals for New York populations (see biological planning above) (ES)
- B. Participate in NRCS NEC Restoration Initiative (FY2011 and potentially beyond)
1. Participate in initial conference calls (FY2011, NYFO ES, Partners for Fish and Wildlife [PFW])
  2. Assist NRCS with ranking criteria for FY2011 WHIP (NYFO ES, PFW)
  3. Assist NRCS with signing up landowners for FY2011 WHIP (PFW)
  4. Provide technical assistance to NRCS for development of outreach products as needed (example – Maine Field Office brochure) (ES, PFW)
  5. Attend NRCS public/landowner information sessions if applicable (PFW)
  6. Convene meeting (Millbrook) with partner agencies to: (1) sign them up for WHIP, if possible; and, (2) develop landowner outreach strategy to sign additional landowners into the program to meet NRCS FY2011 goals (40 acres) (NYFO ES, PFW, NEFO, Coastal) (PFW to deliver identified projects, funding dependent)
    - a. Pre-meeting logistics
      - i. Develop meeting goals, objectives, agenda
      - ii. Develop invite list and send out invitations
    - b. Hold meeting
    - c. Post meeting
      - i. Send notes and action items
      - ii. Additional follow-up TBD

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

# **New England cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area**

## **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Work with New York NEC Team to protect/manage habitat
  - 1. Determine whether there is overlap with current NRCS easements for bog turtle (June 2010 meeting) (completed).
  - 2. Conduct restoration activities in Wetlands Reserve Program (WRP) wetland buffers, as needed, using our equipment for the creation of brush pile, hydro-axe, and plantings.
- B. Participate in NRCS NEC Initiative (FY2011 and potentially beyond) as noted above. (ES, PFW)
- C. If State is interested, consider a Candidate Conservation Agreement with Assurances (CCAA) for New York based on New Hampshire's and Maine's
- D. Develop programmatic conference opinion for NEC habitat restoration (FY2012, NEFO, NYFO)
- E. Develop National Fish and Wildlife Foundation (NFWF) Business Plan for New York

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** No work planned in next 2-3 years.

**Factor C. Disease or predation:** No work planned in next 2-3 years.

**Factor D. The inadequacy of existing regulatory mechanisms:** No work planned in next 2-3 years.

**Factor E. Other natural or manmade factors affecting its continued existence:** Expansion of habitat for NEC will help alleviate pressures from eastern cottontail and address invasive species (see actions under Factor A).

## **OUTREACH**

- Develop outreach strategy to sign up landowners into NRCS or USFWS programs
  - Co-host landowner outreach meeting with NRCS (2011) (ES)
- Develop overall outreach strategy to increase awareness of the species in New York
  - Provide general information to non-profit organizations, hunters, nature centers (2012)

## **New England cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area**

- Update website with NEC information and ongoing projects (2011) (ES and IT)
- “Brake for bunnies” bumper stickers (2012)

### **MONITORING**

Review and track recovery progress. TBD success monitoring will be sought.

#### *Partners*

NYSDEC, New York State Natural Heritage Program (NYSNHP), The Nature Conservancy (TNC), NRCS, Columbia County Land Trust, NFWF

#### *References*

Arbuthnot, M. 2008. A Landowner’s Guide to New England Cottontail Habitat Management. Environmental Defense Fund. 37 pp.

U.S. Fish and Wildlife Service. 2008. Candidate Notice of Review.

U.S. Fish and Wildlife Service. 2009. New England Cottontail Spotlight Species Action Plan.

U.S. Fish and Wildlife Service, Concord, New Hampshire, and Hadley, Massachusetts.

# Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area

## Northern Wild Monkshood Species Action Plan

### FOCAL AREA: LOWER HUDSON HOUSATONIC

#### *Other species benefitting:*

Deciduous forest species: Canada mayflower, white snakeroot, wood nettle; wetland species: willow herb, fowl manna grass, small enchanter's nightshade; and ferns: bulbet fern, fragile fern, and lady fern.

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The Northern monkshood is a glacial relict species that is typically found on shaded to partially shaded cliffs, algific talus slopes, or on cool, streamside sites. These areas have cool soil conditions, cold air drainage, or cold groundwater flowage out of nearby bedrock. In New York, this species is found in semi-shaded seepage springs at high elevation headwaters, in stream-side crevices downstream, and found on shale or conglomerate sandstone. The Recovery Plan states that one site is at 3,800 feet elevation, but has low population density. Year round soil temperatures may be as cold as 6°C (although most are in the range of 11° to 18°C, and the local distribution of this species in a particular habitat is often closely associated with areas where ground water or subterranean air is emanating. Such a condition also contributes to a local microclimate with a consistently high relative humidity. Adult plants do survive (bloom and set seed), but do not reproduce every year, suggesting that a cold soil environment may be essential to dormancy-breaking requirements of the difficult-to-germinate seeds.

Northern monkshood is a perennial and reproduces from both seed and small tubers. The flowers bloom between June and September and are pollinated when bumblebees pry open the blossom to collect nectar and pollen.

Northern monkshood is a highly poisonous plant if consumed and may have medicinal benefits due to these poisonous alkaloid properties.

**Justification for species selection:** Northern monkshood has been Federally-listed as threatened since 1978 and is State-listed as threatened. Although Region 3 has overall species lead, New York Field Office (NYFO) is Region 5 lead. First described as a species in 1886 from a site in Chenango County where it was historically present. Currently, within Region 5, this species only occurs in New York. New York is only one of 4 states with northern monkshood. Adult plants may be long-lived as suggested by Dixon and May (1990) who had evidence that some large plants in New York were at least 40 years old. One can infer that long-lived plants have high reproductive output over the years, and, therefore, need protection to ensure continued reproductive success.

**State contribution to overall species population:** Northern monkshood is only found in Delaware, Sullivan, and Ulster counties within the Catskill Mountain range.

# Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area

## Threats and threat assessment:

Threats<sup>21</sup> (See Recovery Plan):

### Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

- A. Dams and Reservoirs – Possible inundation due to dam construction and resulting reservoir, and the occurrence of reservoirs downstream from monkshood habitat, curtails seed dispersal via flowing water.
- B. Road Construction and Maintenance – Excessive use of deicing agents in winter and herbicides in summer, placement of riprap to stabilize roadbed, road shoulder work, and actual road construction.
- C. Powerline Construction and Maintenance – the main threat is from in-place corridors that further degrade habitat from maintenance activities, especially herbicide drift from aerially dispersed weed retardants, and by physically clearing habitat.
- D. Logging – populations can be impacted when shade trees are removed allowing increased light onto monkshood plants.
- E. Grazing – browsing by animals, specifically white-tailed deer, causes a weakening of the plants by loss of their photosynthetic organs, loss of reproductive potential when flowers or fruits are consumed, and trampling of plants, especially when grazing animals are at high density and the site is used as a pathway, resting place, or wallow.
- F. Development – two types:
  - 1. Foot trail development – potential for redirection or widening of paths could threaten plants in area.
  - 2. Residential and urban development – most known monkshood populations are in rural locations, but some patches may be in urban/residential locations. The former Chenango County sighting is now a developed area and presumably lead to its extirpation. Development increases human presence. Higher land costs, taxes, and complex ownership patterns make preservation more difficult to accomplish in suburban and urban environments.

### Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

- A. Scientific Overcollecting and Overvisitation – caused by peaked scientific curiosity, many people visiting a site results in habitat degradation, and overcollecting resulting in population depletion.

### Factor C. Disease or predation:

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<sup>21</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## **Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area**

- A. Pathogens – seed capsules covered by fungus (Dixon and Cook 1990)
- B. Deer herbivory – see Factor A: Grazing
- C. Slug and caterpillar herbivory

### **Factor D. The inadequacy of existing regulatory mechanisms:**

NA

### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Flooding
- B. Droughts
- C. Cliff failure – may result in total loss of a population.
- D. Invasive species – garlic mustard (*Alliaria petiolata*) encroachment (Mabry *et al.* 2009).
- E. Specific habitat requirements – this species is naturally limited in existence due to the need for moist, cold soil conditions of cliffs, talus slopes, and streamside habitats. On or near cliffs, plants are restricted to a narrow band at the base, on ledges, and in scattered soil pockets normally on the lower portions of an outcrop where it is mostly damp, cool, and protected from prolonged periods of direct sunlight. Where northern monkshood is found, it may be distributed densely, especially in areas where there is active cold air or water seepage. The small number of cliff habitats possessing the right combination of exposure, and cold, root-zone microclimate, together with the particular requirements necessary for seed germination, appear to be the factors largely responsible for the limited distribution of the plant.
- F. Pollinator decline – bumblebees are the most common pollinator of northern monkshood and their populations have been in decline (Kuchenreuther 1996; Mabry *et al.* 2009).
- G. Climate change – increase in temperatures may change the microclimate necessary for northern monkshood survival. Higher temperatures may reduce cold air drainage of slopes and below-ground ice that is needed to maintain moist, cold soils (Mabry *et al.* 2009).

### ***Recovery Goals:***

#### ***Range-wide Recovery Goals/Objectives:***

Delist the species by providing security for all known Northern monkshood locations against damage or destruction of the existing habitats.

To search for new Northern monkshood sites through surveys of all poorly known regions within its known range.

To continue research into the controlled propagation of the species.

***Conservation goal(s) for New York State:*** No goals outlined for the next 3 years.

### **Research/Actions needed:**

## **Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area**

Initiate Northern monkshood population monitoring effort in each state, with the goal of an early warning system to indicate population declines, threats, and land use or ownership changes (Recovery Action 15); search remote, high elevation sites in and around Catskill Mountains and, reinvestigate the old Chenango County location(s) (Recovery Action 213).

- 2007 survey was completed by Sam Adams which included looking for additional sites
- Surveys should be done at least every 5 years
  - Next survey should be done between now and 2012  
(Partners: New York State Natural Heritage Program [NYSNHP], New York State Department of Environmental Conservation [NYSDEC], State Parks, New York State Flora Association [NYSFA]; Cost: U.S. Fish and Wildlife Service [USFWS] would be funding surveys, \$2000-3000) (Endangered Species [ES])

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan 1983
- 5-year review initiated
  - Next 5-year review anticipated in 5 years

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

Conduct propagation research (Recovery Action 12)

- Complete controlled propagation plan with Olive Natural Heritage Society

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Consult with transportation officials and maintenance personnel with the goal of marking the road segment near Peekamoose population against damaging activities (Recovery Action 1134)
  1. Olive Natural Heritage Society made contact in 2003. Follow up with New York State Department of Transportation (NYSDOT) regarding salting in the area.



## **Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area**

B. Consult with NYSDEC trail maintenance staff with the goal of placing trail marker guides in the vicinity of the Beaverbrook population closely skirted by a State foot trail (Recovery Action 1135 and 252)

C. Pursue acquisition of properties that are found to be available (Recovery Action 22)

### **Factor B. Other natural or manmade factors affecting its continued existence:**

No work planned in next 2-3 years.

### **OUTREACH**

Nothing currently identified for next 2-3 years.

### **MONITORING**

Review and track recovery progress.

Provide information to USFWS Region 3 for annual Regional data collection (FY2010, 2011; Cost: staff time) (ES).

#### *Partners*

NYSNHP, NYSDEC, Olive Natural Heritage Society

#### *References*

Dixon, P.M. and R.E. Cook. 1990. Like history and demography of Northern monkshood (*Aconitum noveboracense*) in New York State. Final Report, Cornell Plantations, Ithaca, New York.

Dixon, P.M. and B. May. 1990. Genetic diversity and population structure of a rare plant, northern monkshood (*Aconitum noveboracense*). New York State Museum Bulletin. 491: 167-175.

Kuchenreuther, M.A. 1996. The natural history of *Aconitum noveboracense* Gray (Northern monkshood), a federally threatened species. Journal of the Iowa Academy of Science. 103: 57-62.

Mabry, C., C. Henry, and C. Dettman. 2009. Population trends in Northern monkshood, *Aconitum noveboracense*, at four sample intervals over fifteen years. Natural Areas Journal. 29: 146-156.

The Northern Monkshood Recovery Plan, dated September 15, 1983, prepared by the U.S. Fish and Wildlife Service under contract with Robert H. Read and James B. Hale, Wisconsin Department of Natural Resources, P. O. Box 7921, Madison, Wisconsin 53707.

# **Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area**

U.S. Fish and Wildlife Service. 1998.

# Small Whorled Pogonia (*Isotria medeoloides*): Lower Hudson Focal Area

## Small Whorled Pogonia Species Action Plan

### FOCAL AREA: LOWER HUDSON

#### *Other species benefitting:*

blue sedge, black-edge sedge, Reznicek's sedge, timber rattlesnake, cerulean warbler, Virginia snakeroot, worm-eating warbler, blunt mountain mint

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Small whorled pogonia (SWP) is a small herbaceous orchid found throughout the eastern United States in deciduous and mixed forests. Recently (May 2010), the New York State Natural Heritage Program (NYSNHP), funded via Section 6 of the Endangered Species Act, rediscovered SWP in New York within the newly created Schunnemunk Mountain State Park.

The SWP commonly occurs in moist, acidic soils overlying a fragipan on level to moderately sloping terrain near steeper slopes. Populations are frequently associated with dead wood and are often found in relatively open understories, although they can be found within stands of dense ferns. As an orchid, SWP produces minute seeds that require a mycorrhizal associate in order to provide the nutrients necessary to germinate and grow. The habitat requirements and identity of the fungal associate are not yet known. Individual plants are known to remain dormant for 3 – 4 years, and this effect appears to be related to light levels, as anecdotal and empirical evidence indicates canopy breaks promote population numbers.

The SWP is distinctive with its whorls of five to six glabrous leaves at the terminus of a smooth, green stem. Although few plants flower each year, SWP can produce a terminal one to two yellow-flowered inflorescence in the early summer. This species is predominately self-pollinating and has a relatively low genetic diversity across its range. Confusion can arise when comparing this species to either *I. verticillata* or *Medeola virginiana*. The former can be ruled out as it has a purple, not green, stem, and the latter can be ruled out because of the densely white-haired and wiry stem.

**Justification for species selection:** The SWP is a Federally-listed threatened species (listed endangered 1982, reclassified threatened 1994) as well as a New York State-listed endangered species. As of 2007 there were 150 known and ~90 historical sites in 22 eastern states and Canada. Although this species is relatively wide spread, populations are generally small in size and isolated. The majority of sites range from 1 – 20 stems, although there are exceptional ones in New Hampshire > 100 stems.

## **Small Whorled Pogonia (*Isotria medeoloides*): Lower Hudson Focal Area**

The SWP habitat is fairly nonspecific, upland forests, and the widespread and sporadic nature of individual populations can create ambiguity as to when and where to expect SWP across the landscape. A majority of the historical sites within the species' range are so because of habitat destruction associated with development. Although listing does not protect the species on private lands when there is no Federal nexus (permitting, funding, or ownership), it has allowed for the recognition and protection of this species on Federal lands and regulatory oversight in conjunction with Federally funded and/or permitted projects.

Herbivory is a considerable threat to SWP as it is considered highly palatable forage for deer, rabbit, and slugs. Herbivore populations have rebounded dramatically in the last 100 years, often to unsustainable levels, especially in areas with limited hunting pressure. In particular, deer populations can place undue browsing pressure on SWP and prevent successful growth and reproductive efforts.

The techniques necessary to understand and promote SWP recovery have not been adequately determined and threats to this species still exist. All increases in population numbers since listing are apparently due to the location of additional, established populations through intensive surveys. There is no record of a new population establishing or an existing population greatly expanding since listing; therefore, all losses of individuals of this species due to total habitat conversion appear to be irreversible. Continued action is required to attempt to mitigate and correct this trend.

**State contribution to overall species population:** The SWP has a patchy distribution from Georgia to Maine, but had been found in nearly all eastern states excepting New York until its rediscovery. New York populations serve to connect the New England and southern states across the species' range. The New York population consisted of five stems during 2010 which is typical of the majority of SWP populations outside of New Hampshire and Maine.

### **Threats and threat assessment:**

**Threats** (See 5-year review for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Habitat loss to development and physical destruction is the primary threat to this species via conversion of forested land and construction of infrastructure. The New York population was found on State park property, so this threat is minimal. However, care must be taken, as this newly established State park is developed for recreational use, so that any new infrastructure (e.g., trails) does not impact SWP.

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** NA.

#### **Factor C. Disease or predation:**

## Small Whorled Pogonia (*Isotria medeoloides*): Lower Hudson Focal Area

- A. Fungal diseases have been identified in the past (Ware 1999), but were not observed in the New York population. Herbivory by deer, rabbits, and slugs is a common threat for woodland herbs, especially in areas with restricted hunting, such as State parks.

**Factor D. The inadequacy of existing regulatory mechanisms:** NA.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Canopy closure may negatively affect SWP as it is believed to prefer sites with a semi-open canopy. Limited illegal collection is known to occur. Additionally, trampling and/or handling by researchers can damage plants and/or encourage herbivory.

### *Recovery Goals*

**Range-wide Recovery Goals/Objectives:** Maintain 61 populations in each of three population centers, 75% of which should be viable populations (currently considered a geometric mean of >20 stems over a 3 year period, although this metric is being reevaluated) in order to delist the species.

**Conservation goal(s) for New York State:** Increase knowledge of the distribution and abundance of SWP in New York and promote viability in known populations in order to contribute to the required viable population level needed to delist the species.

**Research/Actions needed<sup>22</sup>:** As this population is newly discovered, initial actions will focus primarily on biological planning research activities in order to understand the habitat, dynamics, and viability of this population as well as locate additional populations. Specifically the following:

- Assist with surveys of the known population in order to determine population size and reproductive effort over 3 years and assess population viability (FY 2011 – FY 2012, New York Field Office [NYFO] Student Temporary Employment Program [STEP] transitioning to New York State Office of Parks, Recreation and Historic Preservation [NYSOPRHP] and NYSNHP, Cost: \$0). Recovery Task 3.2. (Endangered Species [ES]).
- Measure habitat parameters at the known population according to the methods outlined in the Five Year Review, Appendix 1 (NYFO STEP Staff, Cost: \$0). Recovery Task 4.21 (ES).
- Survey for additional populations according to the methods outlined in the Five Year Review, Appendix 2 [dependent on funding], NYSNHP, Cost: \$10,000). Recovery Task 4.1 (ES).
  - Apply for Showing Success grant for surveys (FY2011, NYFO STEP, Cost: \$0) (ES).

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<sup>22</sup> Note that actions listed in orange are planned for Fiscal Year (FY) 2011.

## Small Whorled Pogonia (*Isotria medeoloides*): Lower Hudson Focal Area

- Conduct surveys in additional areas within Schunnemunk Mountain State Park, Sterling Forest State Park, West Point Military Reservation, and at locations with soil series identical to the known population in Orange County, New York (Partners: NYSNHP, [Dependent on funding]) (ESA).
- Using the habitat parameters from above, build a predictive habitat model for New York State in order to refine survey efforts across the State (sensu Sperduto and Congalton 1996) (FY 2012, NYFO STEP or NYFO GIS Staff and NYSNHP, Cost: \$0). Recovery Task 4.23.
- Survey areas identified by the above model for new populations (FY 2013, NYSNHP, Cost: \$10,000 – \$20,000). Recovery Task 4.3.

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan, First Revision (U.S. Fish and Wildlife Service 1992)  
[http://ecos.fws.gov/docs/recovery\\_plan/921113b.pdf](http://ecos.fws.gov/docs/recovery_plan/921113b.pdf).
- 5-Year Review (U.S. Fish and Wildlife Service 2008)  
[http://ecos.fws.gov/docs/five\\_year\\_review/doc2002.pdf](http://ecos.fws.gov/docs/five_year_review/doc2002.pdf).
  - Next 5-year review anticipated in 2013

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- Evaluate the results of the publication currently in review regarding canopy manipulation for application to New York SWP population (NYFO STEP, Cost: \$0). Recovery Task 2.11 (ES).

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Limit possible habitat and physical destruction

## **Small Whorled Pogonia (*Isotria medeoloides*): Lower Hudson Focal Area**

1. Coordinate with NYSOPRHP with regard to the location of recreation developments near SWP (FY 2011 – FY 2013, NYSNHP and U.S. Fish and Wildlife Service [USFWS], Cost: \$0). Recovery Task 1.31 (ES).

### **Factor B. Disease or predation:**

#### A. Limit herbivory

1. Assist NYSOPRHP with construction of enclosure fencing around the known population, adjacent suitable habitat, and establish unfenced control plots (Partners: NYSOPRHP and NYSNHP, Cost: \$ [funded via NYSOPRHP and NYFO Recovery Funds]). Recovery Task 2.13 (ES).
2. Determine and implement, if necessary, controlled deer hunting protocols (FY 2012 – FY 2013, NYSOPRHP, Cost: \$0). Recovery Task 1.31.

### **Factor C. Other natural or manmade factors affecting its continued existence:**

#### A. Manage canopy openness

1. Develop canopy manipulation protocols for application after multiyear population estimate is established (~3 years) (FY 2012, SWP Working Group, Cost: \$0). Recovery Task 2.11.
2. Implement canopy manipulation protocols (FY 2013, Unknown, Cost: \$ [unknown until protocols are established]). Recovery Task 2.11.

#### B. Prevent illegal collection

1. Best accomplished through limited dissemination of population locations.

#### C. Limit researcher impacts

1. Participate in a New York State SWP working group with species partners in order to coordinate efforts and resources (FY 2011, SWP Working Group, Cost: \$0). Recovery Task 1.31 (ES).
2. Ensure all researchers are familiar with the “Minimizing impacts” section of the Five Year Review, Appendix 2. Recovery Task 2.12 (ES).

## **OUTREACH**

- Construct SWP web page for the NYFO site, linking to New England Field Office (NEFO) as needed (FY2011, NYFO STEP Staff, Cost: \$0). Recovery Task 7.1 (ES and IT).

## **MONITORING**

## **Small Whorled Pogonia (*Isotria medeoloides*): Lower Hudson Focal Area**

B. No monitoring planned at this time.

### *Partners*

NYSOPRHP, NYSNHP

### *References*

Sperduto, M. and R. Congalton. 1996. Predicting rare orchid (Small whorled Pogonia) habitat using GIS. *Photogrammetric Engineering and Remote Sensing* 62:1269-1279.

U.S. Fish and Wildlife Service. 1992. Small Whorled Pogonia (*Isotria medeoloides*) Recovery Plan, First Revision. Newton Corner, Massachusetts. 75pp.

U.S. Fish and Wildlife Service. 2008. Small Whorled Pogonia (*Isotria medeoloides*) 5-year Review: Summary and Evaluation. Concord, New Hampshire.

Ware, D. 1999. A recovery plan for the small whorled pogonia at Fort A.P. Hill. Unpublished report. 105 pp.



## ST. LAWRENCE FOCAL AREA

The St. Lawrence Focal Area (SLFA) is located in the northern-most portion of New York and contains approximately 4,667 square miles or 8.6% of the state. The focal area is largely demarcated by the St. Lawrence River drainage basin, although portions of the upper Black River drainage, including the northeastern portion of Tug Hill, are also included. The focal area does not include portions of these drainages lying within the Blue Line of the Adirondack Park as these areas are closely monitored and managed by the State of New York. The SLFA contains the level glacial lake and marine plains and scattered low ridges of the St. Lawrence Lowlands with a local relief of 45-100 feet and the more elevated, rolling, and southerly regions of the Upper St. Lawrence Valley with a local relief of 95-500 feet. Overall elevation ranges are 180-600 feet and 480-1480 feet, respectively. This focal area is characterized by its vast level to undulating terrain, extensive island archipelago in the Thousand Islands region, unique alvar habitats, and large wilderness-fed rivers, including the Black, Oswegatchie, Grasse, Raquette, St. Regis, Salmon, and Trout Rivers.

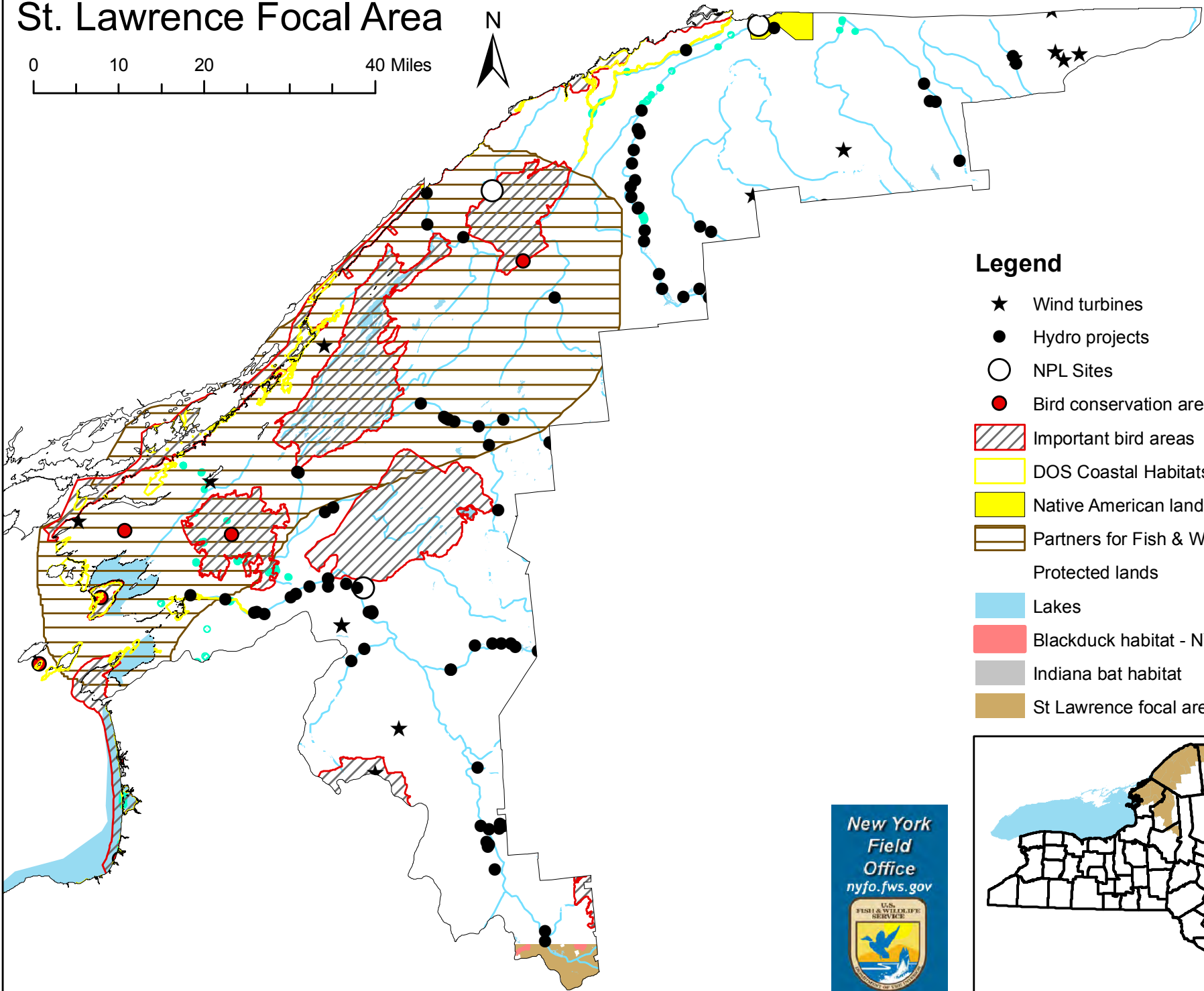
The St. Lawrence River is the outlet for the entire Great Lakes Basin and serves as a major waterborne transportation corridor. Additionally, over 4,000 MW of hydropower are produced on the mainstem and thousands more on tributaries. All of, or portions of, six New York counties are included within the SLFA boundary including Oneida, Lewis, Jefferson, St. Lawrence, Franklin, and Clinton counties. Approximately 250,000 people live within this focal area, concentrated primarily in the municipalities of Watertown, Ogdensburg, Canton, Potsdam, Massena, and Malone. Land use in the lowlands is predominately highly productive grassland agriculture with some areas of urbanization and industrialization in the larger cities and along the St. Lawrence River. These land uses transition to predominately forested lands with lesser amounts of agriculture in the less populated southern upland areas.

This focal area was selected because it contains important riverine and grassland habitats that support locally, nationally, and internationally significant fish and wildlife resources. There are currently one Federally-listed species (endangered [E]) and ten identified species of concern within the focal area. Although there are few, large public landholdings of significance within this focal area, the cooler climate and poor drainage of this region result in an extensive agricultural grassland with a late-season harvest that promotes breeding of grassland bird species (i.e., 16% of global bobolink population). The SLFA is located within Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Area 18 (Saint Lawrence Plain). The extensive island systems of the Thousand Islands Region also support colonies of common tern. Additional successional, forest edge, and forested wetland habitats support populations of woodcock, golden-winged warbler, black duck, and bald eagle. In total, the SLFA has the highest production of waterfowl in the northeast. Forests, forested wetlands, and the variety of other habitats in the SLFA are also important habitats for Indiana bat (E) and the State-listed Blanding's turtle (T). The large rivers consisting of the St. Lawrence and its major tributaries support remnant populations of the once widespread lake sturgeon, northern pike, and American eel populations.

The NYFO actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, navigation, water-level regulations, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss (principally), fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, changes in agricultural practices, shoreline hardening, degraded water quality, and climate change. Current projects include the Fish Enhancement, Mitigation, and Research Fund (FEMRF), St. Lawrence Environment Natural Resource Damage Assessment and Restoration (NRDAR), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

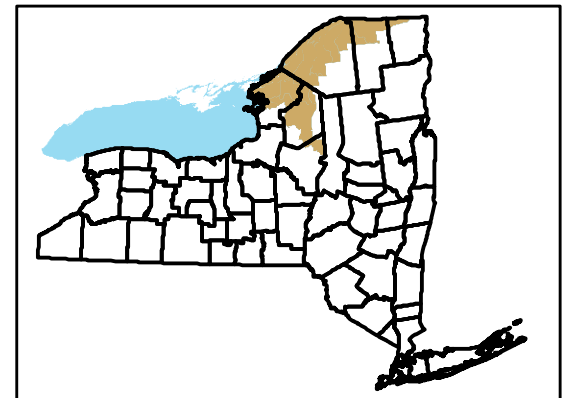
# St. Lawrence Focal Area

0 10 20 40 Miles



## Legend

- ★ Wind turbines
- Hydro projects
- NPL Sites
- Bird conservation areas
- ▨ Important bird areas
- ▨ DOS Coastal Habitats
- ▨ Native American lands
- ▨ Partners for Fish & Wildlife focal area
- Protected lands
- Lakes
- Blackduck habitat - NYFO analysis
- Indiana bat habitat
- St Lawrence focal area



# American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

## American Black Duck Species Action Plan

### FOCAL AREA: ST. LAWRENCE

#### *Other species benefitting:*

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, Greater and lesser scaup, long-tailed duck)

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

**Justification for species selection:** The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR 13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003).

The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

**State contribution to overall species population:** Range extends across New York in freshwater habitat.

#### **Threats and threat assessment:**

- 1. Loss of habitat and habitat function.** Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

#### **Research needed:**

## American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

- Need to characterize habitat loss.
  - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.
  - Develop GIS tools to determine how much high value habitat remains and how much is needed and where.
  - Characterize loss in habitat function (i.e. determine the cause).
  - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.
2. **Invasive species.** Invasive species, such as *Lythrum salicaria* or *Phragmites australis*, have impacts on wetland habitat, potentially adversely affecting black ducks.

### Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
  - Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
  - Evaluate effects of invasive plants.
  - Develop GIS tools to determine how much habitat remains free of invasives.
  - Need to characterize habitat loss due to invasives (i.e. what is causing it).
3. **Hybridization with mallards.** Hybridization between mallards and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

### Research needed:

- Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).
4. **Climate change.** Most existing climate change models predict less runoff and, therefore, lower water levels in the region.

### Research Needed:

- Assess changes in habitat community structure.

## **American Black Duck (*Anas rubripes*): St. Lawrence Focal Area**

- Determine climate change impacts on prey base during breeding season.

### **5. Public Use** (recreational disturbances).

- ### **6. Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks.

(Who: New York State Department of Environmental Conservation [NYSDEC], New York Field Office [NYFO], U.S. Environmental Protection Agency [USEPA] through Great Lakes Restoration Initiative [GLRI]; Cost: NYFO staff time).

### **7. Changes in prey base** during breeding season.

### ***Population goal(s) for New York State:***

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

### **Research needed:**

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for St. Lawrence Valley in New York.

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

#### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit black ducks.
- c. Participate in the New York Wetlands Forum to coordinate wetland restoration/protection activities that would benefit black ducks.
- d. [Consider black duck habitat restoration when developing St. Lawrence Natural Resource Damage Assessment and Restoration \(NRDAR\) case \(Environmental Contaminants \[EC\]\).](#)
- e. Facilitate habitat preservation through coordination with land trusts.
- f. Preserve, restore, and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.

## **American Black Duck (*Anas rubripes*): St. Lawrence Focal Area**

- g. Protecting all remaining habitat. Use GIS or develop new tools to help identify and target, especially the wetlands that have the highest potential to produce black ducks.
- h. If possible, use NRDAR funds to accomplish black duck habitat restoration and protection.

### **2. Loss of habitat function (values diminished).**

- a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
- b. Seek to minimize loss of habitat value by influencing International Joint Commission (IJC) decisions on river water level management.
- c. Invasive species.
- d. Seek to minimize success of invasives colonization in habitat along St. Lawrence River by influencing IJC decisions on river water level management.
- e. Utilize Fish Enhancement, Mitigation, and Research Fund (FEMRF) GIS mapping products or use FEMRF protocol to assess additional areas to determine most suitable locations for placement of water control structures to provide more natural water regime.
- f. See also northern pike species action plan. Actions to restore northern pike habitat will benefit the black duck. Use amphibious excavator to create openings in *Typha* monocultural stands. Do GIS reconnaissance to determine most suitable locations.

### **3. Invasive Species**

- a. Work with partners to identify sites where invasive species control would benefit black duck.
  - i. Design water control structure to allow management of water levels to control and/or manage invasive species.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Loss of habitat.**

- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands by:
  - i. Developing Fact Sheets and best management practices (BMP) to minimize impacts to black ducks.
  - ii. Posting these Fact Sheets/BMP on our website.

## **American Black Duck (*Anas rubripes*): St. Lawrence Focal Area**

- iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
- b. Deliver habitat restoration and enhancement projects by:
  - i. Developing a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.
  - ii. Restore – 60 acres of wetland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority. (FEMRF and Partners for Fish and Wildlife [PFW]).
  - iii. Restore – 60 acres of grassland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority. (FEMRF and PFW).
  - iv. Facilitate habitat preservation of marsh habitat adjacent to tributary streams through coordination with the Thousand Island Land Trust (TILT) and other non-governmental organizations (NGO).
  - v. Working with partners and fellow trustee agencies, identify habitat that could be restored using NRDAR funds associated with the St. Lawrence case.
- c. Influence regulatory agency decisions regarding siting, construction, and operation of wind turbines proposed for the St. Lawrence Valley watershed by:
  - i. Developing Fact Sheets and BMP to minimize impacts to black ducks and other waterfowl (PFW).
  - ii. Posting these Fact Sheets/BMP on our website (IT).
  - iii. Providing substantive comments on proposed wind farms, including the Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie and Lake Ontario Wind Farm proposals to both Federal, State, and local agencies with regulatory influence over windpower project siting and operation (Conservation Planning Assistance [CPA]).
  - iv. Coordinate with Region 3 relative to potential impacts from offshore wind projects (determine if offshore wind projects could have a negative impact to waterfowl (CPA)).

### **2. Loss of habitat function (values diminished).**

- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:



## **American Black Duck (*Anas rubripes*): St. Lawrence Focal Area**

- i. Developing Fact Sheets and BMP to minimize impacts to black ducks (CPA, PFW).
  - ii. Posting these Fact Sheets/BMP on our website (IT).
  - iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks (CPA).
- b. Influence other agencies and the IJC regarding decisions on lake and river water level management by providing substantive comments on proposed water level regulation protocol (CPA).

### **3. Invasive species.**

- a. To mitigate adverse impacts of monotypic cattail stands on wetland habitat, fabricate, and place a water control structure/fish ladder to provide more natural water regime in tributaries to the St. Lawrence.
- b. See northern pike species action plan. Actions to benefit the northern pike will also benefit black ducks. Use amphibious excavator to create openings in monotypic *Typha* stands through a stretch of river/marsh, according to overall habitat restoration plans for the area.

#### *Partners/potential funding:*

Haudenosaunee Confederacy, FEMRF, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation District (SWCD), TNC, Ducks Unlimited (DU), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), State University of New York – College of Environmental Science and Forestry (SUNY-ESF), Clarkson University, St. Lawrence University

### **OUTREACH**

- Landowner education
- Public involvement

Create Outdoor Classroom wetland projects in the St Lawrence watershed

### **MONITORING**

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.

## American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

- Develop BMP from results of monitoring to inform future black duck population restoration activities.

### *References*

Dettmers, R. and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: Lower Great Lakes Plain. Version 1.1: August 2003. ([http://www.blm.gov/wildlife/plan/pl\\_15\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_15_10.pdf)).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).

North American Waterfowl Management Plan: Strategic Guidance (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf>.

North American Waterfowl Management Plan: Implementation Framework (2004). <http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf>.

North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998) <http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf>.  
North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005) [http://www.acjv.org/wip/acjv\\_wip\\_main.pdf](http://www.acjv.org/wip/acjv_wip_main.pdf).

North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009) [http://www.acjv.org/documents/ACJV\\_StrategicPlan\\_2009update\\_final.pdf](http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf).

U.S. Fish and Wildlife Service. 2009. Waterfowl population status, 2009. U.S. Department of the Interior, Washington, D.C. USA. [http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Waterfowl/StatusReport2009\\_Final.pdf](http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Waterfowl/StatusReport2009_Final.pdf).

Zimpfer, N.L., Rhodes, W.E., Silverman, E.D., Zimmerman, G.S., and M.D. Kone. 2009. Trends in Duck Breeding Populations, 1955-2009. USFWS, Laurel, MD <http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Trends/Trend%20Report%202009.pdf>.

Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

## **American Black Duck (*Anas rubripes*): St. Lawrence Focal Area**

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000).  
([http://www.blm.gov/wildlife/plan/pl\\_18\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_18_10.pdf)).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005).  
([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).
- Bird Conservation Plan for the Lower Great Lakes/  
St. Lawrence Plain Bird Conservation Region (USFWS 2007).  
([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).
- North American Waterfowl Management Plan: Strategic Guidance (2004).  
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Implementation Plan (2005).  
[http://www.acjv.org/wip/acjv\\_wip\\_main.pdf](http://www.acjv.org/wip/acjv_wip_main.pdf).
- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic  
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[http://www.acjv.org/documents/ACJV\\_StrategicPlan\\_2009update\\_final.pdf](http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf).

# **American Eel (*Anguilla rostrata*): St. Lawrence Focal Area**

## **American Eel Species Action Plan**

### **FOCAL AREA: ST. LAWRENCE**

#### *Other species benefitting:*

tributary spawning species, redhorse species, white suckers, walleye

### **BIOLOGICAL PLANNING**

#### ***Introduction to species***

**Species information:** American eel (*Anguilla rostrata*) is a semelparous, catadromous species that is a habitat generalist. Their range includes rivers and inland lakes accessible from the Atlantic Ocean. Eel mature in 8 – 30+ years in freshwater prior to migrating to spawn in the Sargasso Sea. About 40% of spawning females at the Sargasso Sea originate in the Lake Ontario/St. Lawrence River Basin. All eel mortality in freshwater occurs prior to spawning resulting in a cumulative impact.

**Justification for species selection:** American eel stocks in the Lake Ontario/St. Lawrence River Basin have been reduced by 99% in the last 20 years. American eel is a Federal trust species and has been identified as a priority species under the New York Field Office - Fish Enhancement, Mitigation, and Research Fund (FEMRF). The species underwent a status review by the U.S. Fish and Wildlife Service (USFWS) but was not designated as threatened or endangered. A recent petition was filed to list the species; this petition is currently under review. American eel is listed as threatened in the Province of Ontario. The Atlantic States Marine Fisheries Commission (ASMFC) developed an Interstate Fishery Management Plan for American eel in 2000, with addendums in 2006 and 2008.

**State contribution to overall species population:** The American eels found in the Lake Ontario/St. Lawrence River basin are exclusively female and represent the largest, most fecund individuals found in the spawning population. As such, it is generally agreed that these females represent a critical component of the spawning population.

#### **Threats and threat assessment:**

- 1. Barriers to riverine movement and upstream habitat access.**
- 2. Hydro turbine mortality of outmigrating eel.**

#### **Research needed:**

- Investigate means to safely trap and transport eels around the St. Lawrence River hydro projects at Moses-Saunders and Beauharnois Dams.

(Who: FEMRF, Ontario Power Generation, Hydro Quebec; Cost: Millions)

## **American Eel (*Anguilla rostrata*): St. Lawrence Focal Area**

- Investigate stocking as a means to temporarily improve recruitment to the Lake Ontario/St. Lawrence River basin.

(Who: Currently being done by Ontario Power Generation and Hydro Quebec)

- 3. Overfishing.**
- 4. Habitat degradation and alteration.**
- 5. Contaminants.**
- 6. Parasitism.**
- 7. Climate change;** potential to affect ocean currents and dispersal of larval eel.
- 8. Cumulative threats.**

### ***Population goal(s) for New York State:***

The American eel is a panmictic species with a single population. However, we can create a goal for the Lake Ontario/St. Lawrence stock of American eel. This goal would be to restore upstream passage numbers at the Moses-Saunders Power Dam to historic levels (1980s) of over one million per year and to maintain the American eel as a self-sustaining component of the St. Lawrence River fish community by reducing all sources of mortality at both the yellow and silver life stages.

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

- 1. Barriers to riverine movement and upstream habitat access.**
  - a. Identify and prioritize streams for eel passage in the St. Lawrence River basin, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan (Partners for Fish and Wildlife [PFW], CPA and FEMRF) (staff time plus variable FEMRF funding).
  - b. Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts; draft plan has been completed to address downstream passage in the St. Lawrence; approximate costs have been estimated (Conservation Planning Assistance [CPA], FEMRF) (staff time only).

## **American Eel (*Anguilla rostrata*): St. Lawrence Focal Area**

- c. Coordinate with developing Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership (CPA, FEMRF, PFW) (staff time only).
- d. Provide technical assistance on stream restoration projects in the watershed, as requested (PFW) (staff time only).

### **2. Hydro turbine mortality of outmigrating eels.**

- a. Lead International Eel Passage Group (IEPG) meetings and present approaches to address turbine mortality through trap/transport alternatives in efforts to foster international support (CPA) (staff time only).
- b. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities (CPA) (staff time only).
- c. Via FEMRF funding, continue research determined necessary by the USFWS to support upstream and downstream passage of eel at the St. Lawrence-FDR Power Project (FEMRF) (unknown dollars from FEMRF).
- d. Hold at least two Fisheries Advisory Council (FAC) meetings annually to discuss FEMRF proposals (FEMRF, CPA) (staff time only).
- e. Hold at least two FEMRF Eel Study Group (ESG) meetings annually to further efforts towards proposed approach to address turbine mortality. The ESG will review FEMRF eel project proposals (CPA, FEMRF) (staff time only).

### **3. Overfishing.**

- a. Attend annual IEPG to address overfishing issues. (CPA, FEMRF) (staff time only).

### **4. Habitat degradation and alteration.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, and dredging and placement of fill in streams and wetlands. (CPA) (staff time only).
- b. Facilitate habitat preservation through coordination with land trusts (Thousand Islands Land Trust [TILT]). (FEMRF) (staff time only).
- c. Manage the St. Lawrence River NRDA case; consider restoration projects that benefit American eel, if possible.

## American Eel (*Anguilla rostrata*): St. Lawrence Focal Area

- d. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions: Green Island. (CPA) (staff time only).
  - e. Address status assessment and listing proposal. (Endangered Species [ESA], CPA) (staff time only).
- 5. Contaminants** (including dams and impassable culverts).
- a. Determine if contaminants are a significant threat to the eels in the St. Lawrence River basin.
  - b. Use NRDA case, Grasse River/ALCOA/GM to direct restoration activities.
- 6. Parasitism.**
- a. Fund studies through FEMRF to determine if this is a significant threat.
- 7. Climate change** (including dams and impassable culverts).
- a. Follow literature to determine if these are actions we need to pursue.
- 8. Cumulative threats.**
- a. Address status assessment and listing proposal. (ESA, CPA) (staff time only)

### *Partner organizations*

Please refer to the following document for existing strategies:

- Great Lakes Fishery Commission – Fish Community Objectives for the St. Lawrence River<sup>1</sup>
- ASMFC/National Oceanic and Atmospheric Administration (NOAA) – Interstate Fishery Management Plan for American Eel<sup>2</sup>
- Ontario Power Generation Action Plan for the Recovery of the American Eel in Lake Ontario/Upper St. Lawrence River 2006 to 2011<sup>3</sup> (Unpublished)
- Hydro Quebec - American Eel Action Plan (Unpublished)
- New York Power Authority – Review of Technologies for Guiding, Capturing, Holding, Transporting, and Monitoring Outmigrating Eels (Unpublished)
- USFWS-FEMRF-ESG – Approach to address turbine mortality (Unpublished)
- Coordinate efforts with other organizations/agencies

USFWS-Lower Great Lakes Fish and Wildlife Conservation Office, U.S. Geological Survey, New York State Department of Environmental Conservation, Department of Fisheries and Oceans, Ontario Ministry of Natural Resources, ministère des Ressources Naturelles et de la Faune Quebec (MRNFQ), St. Regis Mohawk Tribe, New York Power Authority, State

# **American Eel (*Anguilla rostrata*): St. Lawrence Focal Area**

University of New York – College of Environmental Science and Forestry, Ontario Power Generation, Hydro Quebec.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### **1. Barriers to riverine movement and upstream habitat access.**

- a. Identify and prioritize streams for eel passage in St. Lawrence River basin, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan (PFW; FEMRF (variable FEMRF) funding, CPA).
  - i. Evaluate three tributaries per year for fish barriers and develop plans for barrier mitigation to be submitted to the FAC (FEMRF, PFW) (variable FEMRF funding). For FY2011 tributaries are: Barretts, Mullett, Brandy.
  - ii. Look at fish barrier mitigation on Oswegatchie River through relicensing process at two locations (FEMRF) (staff time only).
  - iii. Investigate opportunity to reopen FERC license at Ogdensburg to require upstream and downstream fish passage (FEMRF) (staff time only).

### **2. Hydro turbine mortality of outmigrating eel.**

- a. Lead IEPG (CPA) (staff time only).
  - i. Develop and seek funding for an approach to address turbine mortality through trap/transport alternatives (CPA, FEMRF) (staff time plus unknown FEMRF dollars).
- b. Minimize mortality on the Oswegatchie River through the FERC licensing process.
  - i. Provide fish protection and downstream passage at two developments of the Oswegatchie River Project (CPA) (staff time only).
  - ii. Investigate opportunities to reopen the license at Ogdensburg to provide fish protection and downstream passage (CPA) (staff time only).
- c. Minimize mortality on the St. Regis River through the FERC licensing process.
  - i. Investigate decommissioning/dam removal during Hogansburg relicensing (CPA) (staff time only).
  - ii. Investigate fish protection and passage alternatives at Hogansburg (CPA) (staff time only).



## **American Eel (*Anguilla rostrata*): St. Lawrence Focal Area**

- d. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews (CPA) (staff time only).

- i. Lower Raquette River [DONE]

- ii. Massena-Grasse [DONE]

### **3. Overfishing.**

- a. Work with MRNFQ through IEPG (CPA) (staff time only).

### **4. Habitat degradation and alteration.**

- a. Review dredging projects for impacts to eels (CPA) (staff time only).

### **5. Contaminants.**

- a. Determine if contaminants are a significant threat to the eels in the St. Lawrence River basin.

- i. Continue with the second year of the funded Off Refuge laboratory study, Reproductive Effects of Contaminants on Artificially Matured and Fertilized American eels (staff and analytical funding) (EC)

- b. Use NRDA case, Grasse River/ALCOA/GM to direct restoration activities.

- i. Manage the St. Lawrence River NRDA case ; consider restoration projects that benefit American eel, if possible (staff time only) (EC)

### **6. Parasitism.**

- a. No work identified at this time.

### **7. Climate change.**

- a. No work identified at this time.

### **8. Cumulative threats.**

- a. Address status assessment and listing proposal (ESA, CPA) (staff time only).

## **OUTREACH**

International Eel Working Group

# American Eel (*Anguilla rostrata*): St. Lawrence Focal Area

Work with Great Lakes Fishery Commission

Status assessment and listing proposal

## MONITORING

- Development of protocols to measure progress/success
- Monitoring to measure progress/success
- Investigate potential barrier removals and available habitat both pre- and post-removal
- Investigate stocking as a means to temporarily improve recruitment to Lake Ontario/St. Lawrence River Basin (being done by Ontario Power Generation and Hydro Quebec).

## References

<sup>1</sup>LaPan, S.R., A. Mathers, T.J. Stewart, R.E. Lange, S.D. Orsatti. 2002. Fish-Community objectives for the St. Lawrence River. Great Lakes Fish. Comm. Spec. Pub. 2002  
<http://www.glfco.org/lakecom/loc/slr/co.pdf>

<sup>2</sup>Atlantic States Marine Fisheries Commission (ASMFC). 2000. Interstate Fishery Management Plan for American Eel. ASMFC - Fisheries Management Report No. 36  
<http://www.asmfc.org/speciesDocuments/eel/fmps/eelFMP.pdf>  
Addendum I – Interstate Fishery Management Plan for American Eel, 2006.  
<http://www.asmfc.org/speciesDocuments/eel/fmps/addendumI.pdf>  
Addendum II – Interstate Fishery Management Plan for American Eel, 2008.  
[http://www.asmfc.org/speciesDocuments/eel/fmps/addendum%20II\\_AmericanEel\\_FINAL.pdf](http://www.asmfc.org/speciesDocuments/eel/fmps/addendum%20II_AmericanEel_FINAL.pdf)

<sup>3</sup>Ontario Power Generation Action Plan for the Recovery of the American Eel in Lake Ontario/Upper St. Lawrence River 2006 to 2011. Unpublished. Link to press release brief  
<http://www.opg.com/news/releases/FS-OPG%20Action%20Plan%20For%20The%20Recovery%20Of%20The%20American%20Eel%200.pdf>

# **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

## **American Woodcock Species Action Plan**

### **FOCAL AREA: ST. LAWRENCE**

#### *Other species benefitting:*

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

**Justification for species selection:** Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked “High” (H) on the BCR 13 list of “Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture”. It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a “Bird in Trouble” in the Eastern Forest in the North American Bird Conservation Initiative’s 2009 report, “The State of the Birds, United States of America.”

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

**State contribution to overall species population:** Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can be found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

### **Threats and threat assessment:**

- 1. Loss of habitat and habitat function.** The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).
- 2. Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

### **Research needed:**

- Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).
- 3. Contaminants.** Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009).
  - 4. Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.

## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

### **Research needed:**

- Research is needed to determine the effects of climate change on this species.

### ***Population goal(s) for New York State:***

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

### **Management Objectives for the Population:**

- Halt population declines by 2012 as measured by Singing Ground Surveys
- Have positive population growth by 2022

Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

### **Overall Goal:**

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

### **Management Objectives for Habitat for This Species:**

- Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)
- To increase early successional habitat by 2022

## **CONSERVATION DESIGN**

### ***Strategies for addressing the threats***

## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

### **1. Loss of habitat and habitat function.**

- a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.
  - i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.
  - ii. Work with land trusts to target woodcock conservation.
  - iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).
  - iv. Use geospatial tools to:
    - Analyze existing areas of habitat to determine potential breeding areas;
    - Analyze breeding bird survey data to focus efforts; and,
    - Create map for possible woodcock sites of concern.

### **2. Decline in food supply.**

- a. Strategy will depend upon results of research need noted above.

### **3. Contamination.**

- a. Strategy will depend upon results of research need noted above.

### **4. Climate change.**

- a. Strategy will depend upon results of research need noted above.

*Partners/potential funding:*

# **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), Thousand Islands Land Trust (TILT), and universities.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### **1. Loss of habitat and habitat function.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.
- b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.
- c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this species. In developing BMPs, consider the management recommendation of the NAS 2009 (appended to the end of this document).
- d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat.
- e. Provide technical assistance to NRCS for the Wetlands Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock.
- f. Work with partners (Upper Susquehanna Coalition, RGS, NYSDEC, National Wildlife Refuges [NWR], etc.) to enhance/create early successional habitat within the Focal Area.

### **2. Decline in food supply.**

- a. Delivery will depend upon strategy determined from research noted above.

### **3. Contamination.**

- a. Delivery will depend upon strategy determined from research noted above.

### **4. Climate change.**

- a. Delivery will depend upon strategy determined from research noted above.

## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

### *Partners/potential funding:*

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and WMI. Other potential partners include: USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, TILT, universities.

## **OUTREACH**

### [Landowner education during site visits when potential habitat projects are present \(on-going\) \(PFW\).](#)

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

### [Put Landowners Guide to Woodcock Management up on NYFO web site \(FY2011\) \(IT\).](#)

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds."

### *Potential Outreach Partners:*

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, NYPA, and NGO.

## **MONITORING**



## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

### *References*

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Cooper, T.R., K. Parker, and R.D. Rau. 2008. American woodcock population status, 2008. U.S. Fish and Wildlife Service, Laurel, Maryland. 15 pp.

Keppie, D.M. and R.M. Whiting, Jr. 1994. American Woodcock (*Scolopax minor*), The Birds of North America Online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:  
<http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/100>.

Kelley, James, Scot Williamson and Thomas R. Cooper, eds. 2008. American Woodcock Conservation Plan: A Summary of and Recommendations for Woodcock Conservation in North America. A Wildlife Management Institute Publication, February 2008.

McAuley, D.G., J.R. Longcore, D.A. Clugston, R.B. Allen, A. Weik, S. Williamson, J. Dunn, B. Palmer, K. Evans, W. Staats, G.R. Sepik, and W. Halteman. 2008. Effects of hunting on survival of American woodcock in the Northeast. *Journal of Wildlife Management* 69(4): 1565-1577.

National Audubon Society. 2009. American Woodcock: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 4 March 2010 ([http://ny.audubon.org/PDFs/HRVC\\_AMERICANWOODCOCK.pdf](http://ny.audubon.org/PDFs/HRVC_AMERICANWOODCOCK.pdf)).

NYS Ruffed Grouse Hunting Log to identify core woodcock habitat  
<http://www.dec.ny.gov/animals/56849.html>.

NYSDEC FAQs on Grouse Hunting and Management (with map)  
<http://www.dec.ny.gov/outdoor/48393.html>.

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005 ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Iñigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panjabi, D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/) (VERSION: March 2005).

Sepik, G.F., R.B. Owen, and M.W. Coulter. 1981. A Landowner's Guide to Woodcock Management in the Northeast. Moosehorn National Wildlife Refuge. U.S. Fish and Wildlife Service. 25 pp.

Thogmartin, W.E., J.R. Sauer and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. *The Journal of Wildlife Management*. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007)  
[http://www.acjv.org/bcr13\\_plan.htm](http://www.acjv.org/bcr13_plan.htm).
- American Woodcock Conservation Plan (Kelley et al. 2008)  
[http://www.timberdoodle.org/sites/default/files/woodcockPlan\\_0.pdf](http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf).
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

Woodcock Management Recommendations (NAS 2009):

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).
- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.
- Encourage native trees and shrubs.
- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.
- Maintain young, dense forest of at least 5 acres for nesting and feeding.

## **American Woodcock (*Scolopax minor*): St. Lawrence Focal Area**

- Maintain grassy areas near water sources for feeding and display grounds.

# **Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area**

## **Bald Eagle Species Action Plan**

**FOCAL AREA: ST. LAWRENCE**

*Other species benefitting:*

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

### **BIOLOGICAL PLANNING**

#### ***Introduction to species***

**Species information:** Although newly delisted from the Federal endangered species list, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. The St. Lawrence River valley is important for wintering bald eagles, with over 100 individuals being counted there in January 2010. This represents approximately 25 percent of all bald eagles wintering in the State.

**Justification for species selection:** Once Federally delisted, the bald and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still State listed and a new permit program for authorization of unavoidable take is slowly being utilized. The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the ridge just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines.

**State contribution to overall species population:** The New York State Department of Environmental Conservation (NYSDEC) conducts an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate between resident eagles and seasonal migrants in the annual count in January. The bald eagle is still State listed as threatened.

# Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area

## Threats and threats assessment:

1. Modification or destruction of habitat including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).
2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.
3. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for “death by a thousand cuts” effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.
4. Other man-made or natural factors including collisions with trains – in 2009, 10 (known) bald eagles were killed along the rail line along the Hudson River.
5. Ingestion of environmental contaminants, impacts to reproduction.

## Research needed:

- Identification of essential breeding and wintering habitats to target locations for habitat management and protection.

(WHO: NYSDEC, U.S. Geological Survey [USGS], NYFO)

- Identification of movement patterns, migratory pathways and the locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This needs to include the heights at which eagles fly when riding thermals (in the vicinity of potential wind energy development sites) for both activity associated with breeding and migratory movements.

(WHO: USGS, USFWS Migratory Bird Office, Virginia Tech, Hawk Watch groups, wind energy developers)

- Monitoring contaminant levels in eagles in New York.

(WHO: NYSDEC, NYFO, USGS)

- Continued pathology investigations to determine causes of mortality in bald eagles.

(WHO: NYSDEC, National Wildlife Health Center, NYFO)

## **Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area**

- Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed.

(WHO: permittees of BGEPA permit program, NYSDEC, ESA permittees)

### *Partners/potential funding:*

NYSDEC, New York State Energy Research and Development Authority (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers

### *Population goal(s) for New York State:*

Goal – productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population.

(WHO: NYSDEC)

## **CONSERVATION DESIGN**

### **1. Loss of habitat.**

- a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.
- b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes.
- c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats.

### **2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

- a. Through hunter education programs, address nest protection programs.
- b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.
- c. Develop a strategy for addressing high levels of contaminants, if found.

# **Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area**

## **3. Inadequacy of existing regulatory protections.**

- a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

## **4. Other man-made or natural factors.**

- a. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles.
- b. Address wind related mortalities by improved intraoffice coordination on development of BMP and other strategies.

## **5. Ingestion of environmental contaminants, impacts to reproduction.**

- a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.
- b. Seek to minimize loss of habitat due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

### *Partner organizations:*

Onondaga Audubon Society, Rice Creek Field Station, Cornell Lab of Ornithology, Ripley Hawk Watch, NYSDEC, Haudenosaunee Confederacy.

## **CONSERVATION DELIVERY**

### **1. Loss/degradation of habitat.**

- a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.
  - i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc.

## **Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area**

- ii. Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes (Conservation Planning Assistance [CPA]).
    - iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting.
    - iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting, and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews.
    - v. Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat (CPA).
  - b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats.
    - i. Obtain, prepare, and/or distribute maps outlining key areas for conservation to coworkers who may be reviewing projects in bald eagle habitat.
    - ii. Assist coworkers in drafting language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats.
    - iii. Develop/tweak national guidelines for land management agencies to ensure that their trail systems minimize impacts to bald and golden eagles in concentration areas. Prepare guidelines, and distribute to State Parks, State Forests, and National Forests interpretation staff.
- 2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**
- a. Through hunter education programs, address nest protection programs.
  - b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.
  - c. Develop a strategy for addressing high levels of contaminants if found.
- 3. Inadequacy of existing regulatory protections.**
- a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.



# Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area

## 4. Other man-made or natural factors.

- a. Address other factors.
  - i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles.
  - ii. Address wind-related mortalities by improved intraoffice coordination on development of BMP and other strategies.
  - iii. Meet with new Northern BGEPA coordinator to discuss an approach to compliance (CPA).
  - iv. Work with the NYSDEC, industry, other field Offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors (CPA).

## 5. Ingestion of environmental contaminants, impacts to reproduction.

- a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.
- b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - i. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat (CPA) (2010-2013).

## 6. Address disease or predation, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs.

- a. Investigate whether bald and golden eagle Fact Sheets could be provided at hunter training programs run by the NYSDEC. Develop Fact Sheets and distribute.

## 7. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

- a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes.

## **Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area**

- b. Identify three organizations with whom we could meet to further BGEPA education – builders, outfitters, etc. Participate in the New York/Canada Bald Eagle Task Force to update knowledge of eagles found along the international border.

### **OUTREACH**

See specific examples, above

Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current (CPA).

Develop an accompanying workbook based on the one the BOCES students started.

### **MONITORING**

Development of protocols to measure progress/success.

Monitoring to measure progress/success.

Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles (CPA).

Investigate options for funding to assist the State with post-listing activities (CPA).

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# **Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area**

## **Blanding's Turtle Species Action Plan**

### **FOCAL AREA: ST. LAWRENCE**

#### *Other species benefitting:*

(shrub, swamps/marshes) black duck, wood duck, woodcock, golden-winged warbler, northern pike

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** The Blanding's turtle is a long-lived, late-maturing species that inhabits a wide range of habitats throughout its range, including shrub swamps, marshes, vernal pools, bogs, ponds, lakes, wet prairies, forested wetlands, and low-gradient streams and rivers. Blanding's turtles main range extends disjunctly from southeastern Ontario, adjacent Quebec, and southern Nova Scotia, south into New England, and west through the Great Lakes to western Nebraska, Iowa, and extreme northeastern Missouri. Several disjunct populations occur in the Northeast (eastern New York, eastern Massachusetts, southern New Hampshire, southern Maine, and southern Nova Scotia). These eastern populations have been effectively isolated from the main range for several millennia, are genetically distinct, and may qualify for Federal listing as a Distinct Population Segment under the U.S. Endangered Species Act (ESA). Blanding's turtles mature between 14-21 years and can attain ages greater than 75 years and still reproduce successfully.

In addition, Blanding's turtles use uplands for several parts of their life cycle for nesting, moving among wetlands, basking, aestivation, and possibly feeding. Most individuals move overland (over 3 km) among multiple wetlands throughout the season. In addition, females often move long distances to nesting sites. Habitat, therefore, must be considered in the context of its landscape setting.

Because Blanding's turtles have a generation time of nearly 40 years and population increases take place slowly, recoveries from declines may take many decades or centuries. Therefore, to be effective, conservation efforts must take place well in advance of severe declines.

**Justification for species selection:** Blanding's turtles are State-listed as either threatened or endangered in 9 of 15 states where they occur, including three of the four states in the Northeast. In New York, the Blanding's turtle is State-listed as threatened. At the Federal level, the species is not currently listed under the U.S. Fish and Wildlife Service (USFWS) ESA; under the Canada Species at Risk Act, the species is considered threatened (endangered in Nova Scotia).

**State contribution to overall species population:** In New York, Blanding's turtles are known from the following counties: Dutchess, Saratoga, St. Lawrence, Jefferson, Niagara, and Erie. Evidence suggests there are 3 evolutionary significant units (ESU) for Blanding's turtles across their range. Two of these units occur in New York – the St. Lawrence/western New York populations and those populations in the Hudson River basin. It is likely that there would be a

## **Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area**

minimum of two recovery units established in New York if the species is Federally-listed. With two ESUs, it could be stated that New York's Blanding's turtle population is genetically more diverse than any other State.

### **Threats and threat assessment:**

Threats<sup>23</sup> (see Status Assessment in references):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).
- B. Fragmentation of habitat (connectivity of wetland and upland habitat).

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

#### **Factor C. Disease or predation:**

- A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

#### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

#### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

### ***Recovery Goals***

#### ***Conservation goal(s) for New York State:***

The New York State Department of Environmental Conservation (NYSDEC) is currently writing a Blanding's Turtle Recovery Plan. Although no population goals have been established for

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<sup>23</sup> Refers to 5 listing factors A-E in Section 4 of the ESA.

## **Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area**

New York, the New York Field Office (NYFO) will continue to collaborate with partners to establish target population goals. Empirically determining the status and trends of Blanding's turtles is difficult as a result of sparse data and a long generation time for the species. In general, trends must be inferred based on the species life history and condition/trends of habitat.

### **Research:**

- Extensive surveys to assess known sites and identify new populations.

(Who: NYSDEC, Hudsonia Ltd., New York Natural Heritage Program [NYNHP], State University of New York-Potsdam [SUNY-Potsdam], USFWS; Cost: unknown at this time)

- Conduct genetic analyses needed to address Distinct Population Segment issue before species can be considered for listing.

(Who: NYSDEC, U.S. Geological Survey [USGS], Hudsonia Ltd., NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

- Conduct study on road designs to reduce adult mortality (underpass or overpass designs, crossing signage).

(Who: NYSDEC, USGS, University of Massachusetts (UMass), Federal Highway Administration [FHWA], New York State Department of Transportation [NYSDOT], Hudsonia Ltd., NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Status Assessment - 2007
- Nova Scotia Recovery Plan – 2003
- Quebec Recovery Plan – 2005

In addition, the NYSDEC is developing a Blanding's turtle recovery plan for New York State (A. Ross).

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Assist with development/review of New York State Recovery Plan.

Recovery Plan is currently being drafted by NYSDEC.

- B. Assist with development/review of Northeast Blanding's Turtle Conservation Initiative.

## **Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area**

Northeast States recently applied for FY10 multi-state State Wildlife Grant (SWG) to develop a conservation plan for Blanding's turtles in the northeast region of the United States and initiate implementation of the plan.

- C. Determine potential role with New England Field Office (NEFO)/NYSDEC.

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012.

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).  
Fragmentation of habitat (connectivity of wetland and upland habitat)
  - 1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.
    - a. Draft standard language and compile materials to share with the public (ESA).
    - b. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(Conservation Planning Assistance \[CPA\]\).](#)
  - 2. Develop standard avoidance and minimization measures for development projects.
    - a. Develop standard guidelines to minimize development impacts to the Blanding's turtle.
    - b. Lead meetings to educate local government/townships of presence of the species and provide recommendations regarding development guidelines to reduce impacts.
  - 3. Target wetland mitigation projects, including vernal pool creation/restoration.
    - a. [Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species \(CPA\).](#)
  - 4. Work with NYSDOT and FHWA to reduce road mortality.
    - a. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(USFWS-NYFO, CPA\).](#)

## **Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area**

5. Work with partners to proactively protect the complexes of wetlands and uplands used by extant populations.
  - a. Work to ensure information on known locations of Blanding's turtles is conveyed to land protection partners and land trusts to focus their efforts (ESA).
  - b. Consider Blanding's turtle restoration projects in settlement negotiations regarding St. Lawrence Natural Resource Damage Assessment (NRDA) (CPA).
  - c. Work with the New York Power Authority (NYPA) to monitor success of the installed nesting berm project (required as condition of hydropower relicensing) (CPA).
6. Participate in New York State Recovery Plan and Conservation Initiative meetings.
  - a. Attend and provide input at NYSDEC Recovery Plan meetings as requested. Assist the NYSDEC with development of best management practices (BMP), threats assessment, and mitigation strategies as requested (ESA).
  - b. Provide Service support for 2011 multi-state SWG Blanding's turtle proposal submission, with a priority given to population genetics research (ESA).
7. Assist with NYSDEC surveys.
  - a. Coordinate with the NYSDEC and Glen Johnson (SUNY-Potsdam) to determine survey schedule. (ESA)
  - b. Once confirmed, assist with scheduled surveys to determine presence/absence, population levels, and assist with genetic material collection (Partner: SUNY-Potsdam).

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.
  1. No work identified at this time.

### **Factor C. Disease or predation:**

- A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.
  1. No work identified at this time.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

## **Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area**

- A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.
  1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.
    - a. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(CPA\)](#)

### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).
  1. Identify potential effects to the Blanding's turtle from climate change.
    - a. Work with National Weather Service to create models for determining climate change impacts to the Blanding's turtles.

## **OUTREACH**

Develop education and outreach tools – on land protection needs and conservation restriction options for landowners, on turtles crossing roads, on turtles as pets, on life history strategy, and on nesting turtles.

## **MONITORING**

- Work with partners to review and track recovery progress.
- Establish benchmarks for success based on NYS Blanding's turtle Recovery Plan (pending).

### *Partners*

NYSDEC, NYSDOT, FHWA, USGS, NYNHP, USFWS (NEFO), Hudsonia Ltd., Wilton Wildlife Preserve and Park, The Nature Conservancy (TNC), UMass, SUNY-Potsdam, land trusts, adjacent States

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# Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

## Bobolink Species Action Plan

### FOCAL AREA: ST. LAWRENCE

#### *Other species benefitting:*

northern harrier, rough-legged hawk, red-tailed hawk, American kestrel, loggerhead shrike, upland sandpiper, short-eared owl, Henslow's sparrow, grasshopper sparrow, vesper sparrow, horned lark, blue-winged teal

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Bobolinks are neotropical migrants, traveling to South America each autumn and making a round-trip of approximately 12,500 mi. Bobolink habitat consists of open grasslands and hay fields. During migration and in winter, they use freshwater marshes, grasslands, and rice and sorghum fields. This ground nester looks for open grasslands and hay fields during the summer and builds a nest consisting of dead grass with a central lining of fine grass or sedges. Habitat patch size generally assumed to be a minimum 10 acres, and can be well-managed by late season mowing. The nest may have a canopy of dead grass hanging over top. Clutch size ranges from 1-7 eggs that hatch in 11-13 days. Food consists primarily of seeds and insects. The bobolink is one of the few songbirds that undergo two complete molts each year, completely changing its feathers on both the breeding and wintering grounds. The bobolink is polygynous (Martin and Gavin 1995).

The bobolink is protected under Migratory Bird Treaty Act and listed as a Species of Greatest Conservation Need (SGCN) in New York State.

**Justification for species selection:** The bobolink was chosen as a priority species because of its importance in this geographic area. It has a higher density (19%) in the St. Lawrence Focal area than anywhere else in its range. The bobolink is a grassland bird species targeted by the New York Grassland Bird Conservation Plan. It has been identified as a New York State SGCN in New York (March 2003).

The population estimate for this species for the U.S. and Canada is 11,000,000 with 2,159,750 in Bird Conservation Region (BCR) 13 (Atlantic Coast Joint Venture [ACJV] 2007).

**State contribution to overall species population:** An estimated 17% of the world's bobolink population breeds in the St. Lawrence Valley New York State Department of Environmental Conservation (NYSDEC) (NYSDEC 2005). The bobolink's population trend is stable overall since 1966, but has shown 2-3% decline since 1980. It breeds throughout New York with the exception of the Adirondacks.

#### **Threats and threat assessment:**

## **Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area**

- 1. Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species (In New York, primary disturbance to nesting is hay-cropping; 100% of nests with eggs and young nestlings affected by mowing were abandoned or destroyed).

### **Research needed:**

- There is a need to develop methods and data for modeling distributions and abundance of grassland land cover across the landscape.
- Research is needed to assess impacts of management on productivity of grassland birds, to amplify existing information on grassland bird abundances associated with management.
- Research is needed to determine potential benefits of native grass species as grassland habitat in contrast with demonstrated benefit of non-native cool season grasses.

- 2. Collision with wind energy projects.**

### **Research needed:**

- Research is needed to assess and reduce/mitigate risks from collisions.

- 3. Predation.**

### **Research needed:**

- In South America, on wintering grounds, shooting and trapping is a probable factor as where species is considered a pest of agricultural crops and where males are sold in local pet trade. Needs further study.

- 4. Climate change.** Changes in habitat community structure or prey base may affect this species.

### **Research needed:**

- Research is needed to determine the effects of climate change on this species.

### *Partners/potential funding:*

Ducks Unlimited (DU), land trusts, and non-governmental organizations (NGO), refuges, U.S. Geological Survey (USGS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), NYSDEC, The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, universities

### *Population goal(s) for New York State:*

# Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

680,000 pairs of bobolinks. Per Rosenberg 2000, objective is to provide 775,000 ha of suitable grassland habitat to support the entire habitat-species suite (e.g. 680,000 pairs of bobolinks), with 100,000 ha maintained in large enough patches to support 7,600 pairs of upland sandpipers, and 2,000 ha intensively managed to support 1,000 pairs of Henslow's sparrows in New York and Ontario.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species.
  - a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.
  - b. [Prioritize permit review in grassland habitat \(CPA\)](#).
  - c. Develop fact sheets with best management practices (BMP) to minimize impacts to bobolink and use these to influence landowners regarding habitat needs of this species, including providing guidance regarding haying and mowing practices. In developing BMP consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document).
  - d. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit bobolink through creation of new habitat. If possible, use Natural Resources Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection. In creating bobolink habitat, consider the management recommendation of the NAS 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts.
  - e. Other strategies may result from research needs noted above.
    - i. Use geospatial tools to focus efforts: [Audubon New York is involved in bobolink conservation and may have data layers we can use; check studies by Cornell – in vicinity of Madison County NRCS has shape files for priority areas for Conservation Reserve Program \(CRP\) and Wildlife Habitat Incentives Program \(WHIP\) \(Information Technology \[IT\]\)](#).
    - ii. [Analyze existing areas of habitat to determine potential breeding areas – unlike woodcock, species does not have its own strategic plan; analyze breeding bird survey data to focus efforts \(Conservation Planning Assistance \[CPA\], Partners for Fish and Wildlife \[PFW\], IT\)](#).
    - iii. [Create map for possible bobolink sites of concern \(IT\)](#).

# **Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area**

## **2. Wind energy projects.**

- a. Strategy will depend upon results of research need noted above.

## **3. Predation.**

- a. Strategy will depend upon results of research need noted above.

## **4. Climate change.**

- a. Strategy will depend upon results of research need noted above.

### *Partners/potential funding:*

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

## **CONSERVATION DELIVERY**

On- the-ground actions using strategies to address threats FY2010-2012

### **A. Habitat loss and fragmentation.**

1. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to bobolink and/or their habitat.
2. Post on New York Field Office (NYFO) web site fact sheets with BMP to minimize impacts to bobolink and/or their habitat.
3. 2011 – 2013 Restore 50 acres of early successional grassland habitat to benefit bobolink and other birds with similar habitat needs at project site patch size of  $\geq 10$  acres (PFW).
4. Consider bobolink restoration projects in settlement negotiations regarding St. Lawrence Natural Resource Damage Assessment (NRDA) (Environmental Contaminants [EC]).

### **B. Collision with wind energy projects.**

1. Delivery will depend upon strategy determined from research noted above.

### **C. Predation.**

1. Delivery will depend upon strategy determined from research noted above.

# **Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area**

## **D. Climate change.**

1. Delivery will depend upon strategy determined from research noted above.

### *Partners/potential funding:*

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

## **OUTREACH**

Potential outreach needs:

- PFW Landowner Handouts
- NYFO Outreach (traveling exhibits)
- Local newspaper/TV
- DU *Flyways* articles
- Other Federal and State agency referrals/coordination
- Working with NGO (land trusts, TNC)

### *Partners/potential funding:*

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

## **MONITORING**

Develop protocols to measure progress/success of all conservation delivery activities.

Work with partners to identify leads for accomplishing monitoring activities.

Develop best management practices from results of monitoring to inform future bobolink population restoration activities.

### *References*

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## **Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area**

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USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)). Existing strategies for bobolink restoration:

Please refer to the following documents for exiting strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000) [http://www.blm.gov/wildlife/plan/pl\\_18\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_18_10.pdf).
- "A Plan for Conserving Grassland Birds in New York," Final Report to NYSDEC (Morgan and Burger 2008). <http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf>.
- Partners in Flight North American Landbird Conservation Plan [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) [http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) [http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

Bobolink Management Recommendations (NAS 2009):

## **Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area**

- Create large habitat patches (greater than 20 acres) and minimize woody edges whenever possible. Suitable habitat includes grasslands of moderate height (8-12") and density, with adequate litter.
- Protect nesting habitat from disturbance during the breeding season (early May to August 1) by postponing haying, burning, and moderate or heavy grazing.
- Perform management activities in early spring, several weeks prior to the arrival of adults on the breeding grounds, or in the late summer or fall after the breeding season.
- Use a rotating management schedule on several nearby grassland fragments to provide a variety of habitat conditions. Adjacent patches of similar habitat provide refuge for fledglings to escape from mowed areas and for late-nesting females.
- Create or maintain patches of relatively sparse, grass-dominated vegetation resembling old hayfields (more than 8 years since planted).
- Encourage scattered forbs, such as clover, for nest-site cover and also for seeds and host plants for various invertebrates, which are critical for feeding rapidly growing nestlings.
- Mow or burn patches every 2-3 years to prevent development of woody vegetation.
- Avoid disturbance of suitable habitat (e.g., mowing) during the breeding season, May 1 to August 1.



# Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

## Common Tern Species Action Plan

### FOCAL AREA: ST. LAWRENCE

#### *Other species benefitting:*

Waterbirds and Diving Waterfowl - Bonaparte's gull, little gull, canvasback, common goldeneye, greater scaup, lesser scaup, long-tailed duck

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The common tern is a colonial breeder, breeding in wetland-open water habitats throughout the Great Lakes and along the northern Atlantic Coast. The common tern is an opportunistic forager taking small (3-15 cm) forage fish, crustaceans, and insects within 50 cm of the water's surface. They nest on islands, marshes, and lake and ocean beaches. Common terns prefer nest sites with sand, gravel, shell, or cobble substrates with scattered vegetation, or other protected areas where chicks can shelter. The North American common tern population is migratory, wintering mainly in South America or western Central America.

A recent review (Morris *et al.* 2010) of Great Lakes (and the St. Lawrence River) common tern survey data from 1976-2000 indicates long-term declines in nest numbers and colony sites. Band recovery data indicate that the Great Lakes common tern population is endemic with little immigration from the east coast population or elsewhere (Haymes and Blokpoel 1978; Blokpoel and Courtney 1982, as cited within Morris *et al.* 2010). The authors (Morris *et al.* 2010) suggest that specific policy development and management action is urgently needed to stabilize numbers of common terns on the Great Lakes.

**Justification for species selection:** The common tern is a New York State (NYS) Threatened Species and a NYS Species of Greatest Conservation Need. In the Great Lakes focal area, common tern is also rated as High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR) (BCR 13, Atlantic Coast Joint Venture [ACJV] 2007). The overall trend in Great Lakes common tern nest numbers between 1976 and 2000 was negative (-19.1%) and represents a net decrease of 2,140 nests and 18 active nesting sites (Morris *et al.* 2010).

**State contribution to overall species population:** ACJV (2007) notes an estimated common tern population for BCR 13 of greater than 6,484 pairs. The Thousand Islands area of the St. Lawrence River contains at least 28 colonies (~totaling 700 pairs) of common terns (New York State Department of Environmental Conservation [NYSDEC] 2005). An additional 400 pairs are located on Lake Oneida islands in New York (NYSDEC 2005). Common terns also breed along the northern and western shores of Lake Erie (including Buffalo Harbor), the U.S. waters of the Niagara River, and Lake Ontario (Morris *et al.* 2010).

**Research needed:** Increase knowledge/understanding of common tern in New York.

## Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

- Great Lakes Colonial Waterbird Surveys conducted every 10 years – determine NY status: survey should be occurring soon (2011-2015). (Who: NYFO (CPA); cost: NYFO staff time). (CPA)

- Recommended monitoring: survey of known nest colonies every five years-determine NY status: survey should be occurring soon (2012-2013?).

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Data on waterbird abundance, distribution, chronology, population trends, and factors affecting them (habitat availability and management).

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Chronology and peaks of waterbird movements, temporal composition of migrants, and factors affecting turnover rates at stopover sites.

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Distribution, abundance, conditions, and ownership of wetlands and other important waterbird habitats, how they are affected by climatic patterns and human activities, and where there is potential to restore and enhance additional waterbird habitat.

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

- Analyze existing areas of breeding habitat and recently altered shoreline to determine potential breeding areas (FY 2012).

(Who: Audubon, NYSDEC, NYFO; Cost: NYFO staff time)

### Threats and threats assessment:

#### 1. Competition and Predation of nesting and foraging habitat.

##### Research needed:

- Research involving habitat availability, relationships with gulls (specifically, ring-billed gulls), double-crested cormorants, and other competitors and food requirements are key areas that need further study (Hyde 1997).

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: Unknown at this time)

- Waterbird nutritional requirements/food preferences.

## Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: Unknown at this time)

- 2. Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, and vegetation succession.

**Research needed:** Assess how human disturbance affects waterbird foraging and breeding and ways to reduce these impacts.

- Post-construction monitoring at Peace Bridge related to habitat displacement of the structure.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: NYFO staff time)

- Pre- and post-construction monitoring for on- and off-shore wind projects.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: NYFO staff time)

- Survey to identify potential areas of overlap for nuclear development and common tern habitat.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO; Cost: NYFO staff time)

- Review Great Lakes water level data and impacts to existing habitat.

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO, U.S. Geological Survey [USGS]; Cost: NYFO staff time)

- 3. Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

**Research needed:**

- Assess how human disturbance affects waterbird foraging and breeding and ways to reduce these impacts.

- 4. Climate change;** changes in habitat community structure and changes in prey base during breeding season.

**Research needed:**

- Determine changes in species distribution and population sizes due to climate change (especially the impacts of flooding and rising water levels on existing habitat).

# Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

(Who: Audubon, Cornell Lab of Ornithology, NYSDEC, NYFO, USGS; Cost: NYFO staff time)

## 5. Environmental contaminants.

### Research needed:

- Assess the effects of contaminants on waterbirds, especially at Great Lakes Areas of Concern (AOCs) and Confined Disposal Facilities that are used by foraging birds.

(Who: NYSDEC, NYFO, U.S. Environmental Protection Agency [USEPA] through GLRI; Cost: NYFO staff time)

### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Ducks Unlimited (DU), Audubon NY, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, USEPA through GLRI, and other Great Lakes funding sources.

### *Population goal(s) for New York State:*

Increase to 2,500 pairs (ACJV 2007). The State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) indicated a need to develop a long-term plan that established population objectives for beach and island ground-nesting birds (common tern) and recommended appropriate management options. Currently, NYSDEC recommends protecting existing common tern habitat and creating new habitat to expand nesting opportunities (NYSDEC 2005).

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Objectives: Increase local populations, through the protection, preservation, and/or restoration of common tern nesting and foraging habitat along the Great Lakes shoreline.

1. **Competition and Predation** of nesting and foraging habitat.
  - a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects.
  - b. Other strategies may result from research need noted above.
2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, and vegetation succession.

## Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas.
  - b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, nesting habitat improvement projects (including artificial nesting platforms).
  - c. Other strategies may result from research need noted above.
- 3. Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.
- a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding, foraging, and migration areas.
  - b. Other strategies may result from research need noted above.
- 4. Changes in habitat community structure and changes in prey base during breeding season due to climate change.**
- a. Identify potential future habitat areas above current water levels and protect or restore the habitat for common terns.
  - b. Other strategies may result from research need noted above.
- 5. Environmental contaminants.**
- a. Evaluate and prioritize USFWS Natural Resource Damage Assessments along the Great Lakes/St. Lawrence River.
  - b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC (potentially 2010-2014).
  - c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - d. Other strategies may result from research need noted above.

### CONSERVATION DELIVERY

#### *On-the-ground actions using strategies to address threats for FY 2011-2013*

- 1. Competition and Predation of nesting and foraging habitat.**

## Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

- a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects.
    - i. No work identified at this time.
  - b. Other actions may result from research need noted above.
- 2. Loss of habitat** due to island/shoreline development, water level management of the Great Lakes and St Lawrence River, and vegetation succession.
- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas.
    - i. Create map or shapefile of existing and potential common tern breeding and foraging areas for all NYFO programs (2011-2012). (IT)
    - ii. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013). (CPA)
    - iii. Provide substantive Federal agency comments on the New York Power Authority (NYPA) Common Tern Habitat Improvement Project (2011-2013) (CPA)
  - b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, and nesting habitat improvement projects (including artificial nesting platforms).
    - i. Restore common tern habitat in the Niagara River (Natural Resource Damage Assessment and Restoration [NRDAR] Love Canal Settlement: 2012-2013).
  - c. Other actions may result from research need noted above.
- 3. Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.
- a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in common tern breeding, foraging, and migration areas.
    - i. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013). (CPA)
  - b. Other actions may result from research need noted above.

## Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

4. **Changes in habitat community structure and changes in prey base during breeding season due to climate change.**
  - a. Identify potential future habitat areas above current water levels and protect or restore the habitat for common terns.
    - i. No work identified at this time.
  - b. Other actions may result from research need noted above.
5. **Environmental contaminants**
  - a. Evaluate and prioritize USFWS Natural Resource Damage Assessments along the St. Lawrence River.
    - i. Manage St. Lawrence River Environment case (2011-2013); consider restoration projects that benefit common tern. (EC)
  - b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the “Fish Tumors” Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2013).
    - i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010) (2011-2013).
    - ii. Assess the “Fish Tumors” Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats; work will commence in early summer 2011(2011-2013). (EC)
    - iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: 2011-2013). (EC)
  - c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
    - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to common terns and/or their habitat (2011-2013). (EC)
  - d. Other actions may result from research need noted above.

# Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

## OUTREACH

- Update/distribute existing NYSDEC fact sheet to educate and encourage landowners to control predators that represent significant threats to the viability of species-at-risk such as common tern. <http://www.dec.ny.gov/animals/7100.html>

## MONITORING

- Development of protocols to measure progress/success for any common tern habitat enhancement and/or restoration projects developed and constructed.
- Seek funding and support for monitoring.

### *Partners*

USEPA, USGS, NRCS, NYSDEC, County SWCD, TNC, DU, Audubon NY, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, and Haudenosaunee Confederacy.

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## **Common Tern (*Sterna hirundo*): St. Lawrence Focal Area**

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf))

USFS. 2001. Draft Conservation Assessment for Common tern (*Sterna hirundo*). October 2001. [http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/bird\\_Sterna\\_hirundo-CommonTern.pdf](http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/bird_Sterna_hirundo-CommonTern.pdf)

# Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area Golden-winged Warbler Species Action Plan

## FOCAL AREA: ST. LAWRENCE

### *Other species benefitting:*

American woodcock, blue-winged warbler, brown thrasher, field sparrow, willow flycatcher, Canada warbler, yellow-breasted chat

## BIOLOGICAL PLANNING

### *Introduction to species*

**Species information:** The golden-winged warbler (GWWA) is an imperiled neotropical migrant. In New York, the majority of its territories are in shrubby fields produced by secondary succession following farmland abandonment. It is insectivorous, eating moths and their pupae, winged insects, caterpillars, and spiders, while foraging generally in the upper half of small trees and shrubs. Nest sites are often located along the shaded edge of a forest-field (Confer 1992).

**Justification for species selection:** The GWWA is declining precipitously in the northeastern U.S. (7.6% per year in U.S. Fish and Wildlife Service [USFWS], Region 5), while increasing in the northern and northwestern portions of its range where farmland abandonment and clear cutting is common. The decline may be due, in part, to a loss of shrubland habitat. In addition, this decline correlates with the range expansion of the blue-winged warbler into the range of the GWWA. The northward expansion and resultant zone of overlap has led not only to increased competition, but also to widespread interbreeding between the golden-winged and blue-winged warblers. Because of this wide-spread hybridization, populations of pure GWWA may soon disappear after the arrival of the blue-winged warblers (Cornell Lab of Ornithology). Petition for listing received in 2010.

The GWWA was chosen as a priority species because of its importance in the northeast. It is a New York State (NYS) Species of Special Concern, a NYS Species of Greatest Conservation Need, and is rated High-High in Bird Conservation Region (BCR) 13. Golden-winged warblers require patches of herbs, shrubs, and scattered trees adjacent to forest edge secondary succession, and may use marshes and bogs with forest edge, moderate size sites 10-15 hectare (ha).

Global Population estimated at 210,000 individuals

BCR 13 population estimated at 10,000 individuals, only 5,000 in New York

Populations declining at approximately 7.5 % per year in Region 5

**State contribution to overall species population:** Range extends across New York; however, population declines in southeast New York have been observed. Slight population expansion believed in Lake Ontario plain and northern New York. Breeding Bird Atlas results for 2000 to

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

2005 showed a significant population decline across the State with the only remaining stronghold in the St. Lawrence Valley of northwestern New York.

### **Threats and threat assessment:**

- 1. Loss of sufficient quantity/quality of habitat**, largely as a result of habitat succession. Shrub and early successional habitats a high priority in the Lower Great Lakes Plain. (Dettmers and Rosenberg 2003).

#### **Research needed:**

- Research is needed to determine the range of suitable habitats and identify present breeding sites for GWWA in this region.
- Research is needed to compare early-succession habitats resulting from natural disturbances vs. forestry practices for high-priority species.
- Study of the impacts of human development on early succession species is needed.
- Research is needed to determine the effects of current game and waterfowl management practices on priority nongame species, especially the relationships between American woodcock management and GWWA population expansion.

- 2. Hybridization with blue-winged warbler.**

#### **Research needed:**

- Research is needed to determine habitat-management options (e.g. succession stage, water regime) that will discourage blue-winged warblers and favor GWWA.
- Research is needed to determine the influence of climate and elevation upon GWWA and blue-winged warbler.

- 3. Interference or exploitation by blue-winged warbler.**

- 4. Nest parasitism by brown-headed cowbirds.**

- 5. Livestock overgrazing.**

- 6. Mowing and herbicide** treatment of woody areas (highway power line right-of-ways [ROW]), especially during the breeding season.

- 7. Climate change:** Climate change may be pushing species northward and to higher elevations (GWWA Working Group identified this threat).

#### **Research needed:**

## Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area

- Research is needed to evaluate effects of climate change/temperature gradient on both blue-winged warblers and GWWA.

**8. Reduction in timber harvesting** in some areas.

**9. Loss of winter habitat.**

Note: Several Important Bird Areas in New York that contain important shrub-early successional habitat of value to GWWA are: Hemlock and Canadice Lakes; Hi-Tor Wildlife Management Area; and, Letchworth State Park (Robertson & Rosenberg 2003).

### *Partners/potential funding*

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, New York State Department of Transportation (NYSDOT), utilities, Partners in Flight (PIF).

### *Population goal(s) for New York State:*

8,500 pairs of GWWA. (Robertson & Rosenberg 2003) Objective: Provide roughly 260,000 ha of disturbed or shrub habitat to support the habitat-species guild, of which 18,000 ha should be suitable to support 8,500 pairs of GWWA. (Robertson & Rosenberg 2003).

Objective: Roughly 40,000 ha of shrub habitat is required to maintain the entire habitat-species suite (e.g., 60,600 pairs of field sparrow); of this, 12,000 ha should be maintained in a condition suitable to support 3,000 pairs of GWWA (Dettmers & Rosenberg 2003).

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

**1. Loss of sufficient quantity/quality of habitat.**

- a. Prioritize permit review in breeding areas of this species (shrub, field, and forest habitat) (Conservation Planning Assistance [CPA]); influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
- b. Participate in the GWWA Atlas project - survey dates for New York are May 10 to June 15. (<http://www.birds.cornell.edu/gowap/protocol.html>) (CPA).
- c. Review wind energy projects within the watershed to minimize impacts to this species (CPA).

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

- d. Prioritize grassland and shrub restoration projects that would benefit this species (Partners for Fish and Wildlife [PFW]).
  - e. Initiate discussions regarding a thorough inventory of potential grassland habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome (PFW).
  - f. Work with Partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PFW).
  - g. Use telemetry to monitor distributions and identify essential habitats.
  - h. Increase knowledge/understanding of GWWA in New York.
  - i. Analyze existing areas of shrub habitat and recently altered forest landscapes to determine potential breeding areas for this species.
  - j. Obtain breeding bird survey and GWWA Atlas data for this species to focus efforts.
  - k. Create map or shapefile for possible GWWA sites for all New York Field Office (NYFO) programs.
  - l. Review potential for GWWA management at Fort Drum, NY.
  - m. Review prescribed burning practices and potential for 5 -7 year rotation to sustain GWWA population over time.
- 2. Hybridization with blue-winged warbler.**
- a. Strategy will depend upon results of research need noted above.
  - b. Review literature and gather information, produce a summary of this review to be shared with NYFO staff. (CPA)
- 3. Interference or exploitation by blue-winged warbler.**
- a. Strategy will depend upon results of research need noted above.
- 4. Nest parasitism by brown-headed cowbirds.**
- a. Review literature for documentation/incidence of brown-headed cowbird parasitism upon GWWA in St. Lawrence watershed, produce a summary of this review to be shared with NYFO staff. (CPA)
  - b. Review potential brown-headed cowbird management practices.

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

- i. Monitor GWWA nests and remove or addle cowbird eggs (Siegle and Ahlers, 2004).
  - ii. Shoot cowbirds during the GWWA breeding season (Siegle and Ahlers, 2004).
  - iii. Trap cowbirds until desired results are achieved (Siegle and Ahlers, 2004).
  - iv. Do not feed birds seed that is attractive to cowbirds, such as millet or milo (Siegel and Ahlers, 2004).
  - v. Reduce saplings and canopy at nesting locations to reduce perch sites for cowbirds.
- 5. Livestock overgrazing.**
- a. Prevent livestock from entering breeding territories (Siegel and Ahlers, 2004).
  - b. Concentrate feeding areas as much as possible (Siegel and Ahlers, 2004).
  - c. Implement grazing rotation plan that relocates livestock during GWWA breeding season (Siegel and Ahlers, 2004).
- 6. Mowing and herbicide treatment of woody areas (breeding season).**
- a. Determine whether species sensitivity is a consideration of mowing schedules along highways, ROW, and park campgrounds.
  - b. Evaluate consequences, if any, of recommending a policy of not mowing or treating areas likely to support GWWA during breeding season, including ROW, along roadways, and utility ROW.
- 7. Climate change.**
- a. Strategy will depend upon results of research need noted above.
- 8. Reduction in timber harvesting in some areas.**
- a. Strategy will depend upon results of research need noted above.
- 9. Loss of winter habitat.**
- a. Strategy will depend upon results of research need noted above.

*Partners/potential funding*

# **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCDs, TNC, Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, NYSDOT, utilities, PIF.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 - 2012

### **1. Loss of sufficient quantity/quality of habitat.**

- a. Prioritize permit review in breeding areas of this species (shrub, field, and forest habitat) (CPA); influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
  - i. Contact GWWA Working Group to determine if map of GWWA sites of concern exists.
  - ii. Obtain or create a map of GWWA sites of concern.
  - iii. Obtain or create a map depicting scrub-shrub and other habitat likely to support GWWA breeding requirements including utility ROW.
  - iv. Obtain or create a map with suitable GWWA habitat at higher elevations.
- b. Participate in the GWWA Atlas project - survey dates for New York are May 10 to June 15. (<http://www.birds.cornell.edu/gowap/protocol.html>) (CPA).
- c. Review wind energy projects within the watershed to minimize impacts to this species (CPA).
- d. Prioritize grassland and shrub restoration projects that would benefit this species and complete at least one restoration project for this species.
- e. Initiate discussions regarding a thorough inventory of potential grassland habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome (PFW) (FY 2011 – FY 2012).
- f. Work with Partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PFW) (FY 2012 – FY 2013).
- g. Use telemetry to monitor distributions and identify essential habitats.
  - i. Determine if telemetry studies have occurred or are ongoing.

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

- h. Increase knowledge/understanding of GWWA in St. Lawrence watershed and New York.
    - i. [Contact John Confer, Ithaca College and communicate results of conversation to NYFO staff \(Staff time\).](#)
  - i. Analyze existing areas of shrub habitat and recently altered forest landscapes to determine potential breeding areas for this species (see 1.A.i.).
  - j. Obtain breeding bird survey and GWWA Atlas data for this species to focus efforts (FY 2011 – FY 2012).
  - k. Create map or shapefile for possible GWWA sites for all NYFO programs (FY 2011–FY 2012).
  - l. Work with NRCS to provide technical assistance to restore acres and habitat utilizing the Wildlife Habitat Incentives Program (WHIP) (PFW) (FY2011 – FY2013).
    - i. [Contact NRCS to determine ongoing consideration given to GWWA and share resources to date \(Staff time\).](#)
  - m. [Evaluate restoration options during Natural Resource Damage Assessment and Restoration \(NRDAR\) \(St. Lawrence Environment NRDA case\) that account for scrub-shrub and GWWA habitat \(FY 2011- FY2013\) \(Environmental Contaminants \[EC\]\).](#)
  - n. Become a member of the Northeast PIF Working Group and Golden-winged warbler Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. [A NYFO Outreach representative will join the Northeast PIF Working Group.](#)
- 2. Hybridization** with blue-winged warbler.
- a. [Review literature and gather information \(Staff time\).](#)
  - b. Delivery will depend upon strategy determined from research above.
- 3. Interference or exploitation** by blue-winged warbler.
- a. Delivery will depend upon strategy determined from research above.
- 4. Nest parasitism** by brown-headed cowbirds.
- a. [Review documentation and incidence of brown-headed cowbird parasitism upon GWWA in the St. Lawrence watershed and New York State \(Staff time\).](#)



## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

- i. Review literature (e.g. Confer 2003); produce a summary of this review to be shared with NYFO staff (Staff time).
    - ii. Determine whether annual monitoring of GWWA nests is presently ongoing in St. Lawrence watershed and New York (Staff time).
    - iii. Produce a summary of this review to be shared with NYFO staff (CPA).
  - b. Implement cowbird management practices to reduce population and/or parasitism rate upon GWWA brood success (FY2012- FY2013).
- 5. Livestock overgrazing.**
- a. Determine the extent of livestock grazing on ROW and review the requirements established, if any, through a permitting process.
- 6. Mowing and herbicide treatment** of woody areas (highway power line ROW), especially during the breeding season.
- a. Determine whether species sensitivity is a consideration of mowing schedules along highways, ROW, and park campgrounds.
    - i. Contact State park authorities, utility companies, and NYSDOT (FY2011 – 2013).
- 7. Climate change.**
- a. Delivery will depend upon strategy determined from research above.
- 8. Reduction in timber harvesting** in some areas.
- a. Delivery not yet determined.
- 9. Loss of winter habitat.**
- a. Delivery not yet determined.

### *Partners/potential funding:*

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCDs, TNC, Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, NYSDOT, utilities, PIF.

## **OUTREACH**

- 1. Landowner education.**

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

- a. Provide actual and potential PFW applicants with information regarding GWWA habitat requirements for consideration (FY2011 – FY2013).
- b. Call for grant proposals to fund landowner education and outreach through private organizations (e.g. Audubon New York, Cornell Lab of Ornithology, Wilson Ornithological Association) (FY2012 – FY2013).

### **2. Public involvement.**

- a. Provide actual and potential PFW applicants with information regarding GWWA habitat characteristics (FY2011 – FY2012).

### **3. NYSDOT and utilities.**

- a. Invite NYSDOT and utilities to outreach events (FY2012 - FY2013).

### **4. Agencies (NRCS, U.S. Army Corps of Engineers, etc.).**

- a. Partner with NRCS and provide PFW applicants with information on the WHIP relative to the GWWA (FY2011 – FY2013).

### **6. Smart Growth and Land-use Planning.**

- a. Consider an endorsement to provide businesses and developers with an incentive to redevelop areas already developed and/or industrialized rather than develop undeveloped lands.

## **MONITORING**

- Develop protocols to measure success of all conservation delivery activities
- Work with Partners to identify leads for accomplishing monitoring activities
- Develop best management practices from results of monitoring to inform future GWWA population restoration activities.

### *References*

Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish & Wildlife Service, Sunderland, Massachusetts.

Confer, John L. 1992. Golden-winged Warbler (*Vermivora chrysoptera*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/020>.

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

Confer J.L., P.E. Allen, and J.L. Larkin. 2003. Effects of vegetation, interspecific competition, and brood parasitism on Golden-winged Warbler nesting success. *The Auk*. 121:138-144.

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<http://www.birds.cornell.edu/gowap/index.html>.

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Morgan, Michael and Michael Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under contract #C005137. Audubon New York, Ithaca, New York. 8 May 2008.

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005.  
([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January 2007.  
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Robertson, Bruce and Kenneth V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003  
([http://www.partnersinflight.org/bcps/plan/pl\\_24\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf)).

Existing strategies for GWWA restoration:

Please refer to the following document for existing strategies:

- NYSDEC Recovery Plan – Sterling Forest Bird Conservation Area (Orange Co.), John Thatcher BCA (Albany Co.), Letchworth Park (Livingston Co.).  
<http://www.dec.ny.gov/animals/27024.html>.
- Golden-winged Warbler Status Assessment and Conservation Plan  
<http://web.utk.edu/~buehler/GWWAA/status.htm>.

## **Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area**

- The Nature Conservancy Species Management Abstract  
[http://www.nbii.gov/portal/community/Communities/Ecological\\_Topics/Bird\\_Conservation/USFWS\\_Focal\\_Species/Golden-winged\\_Warbler/Distribution\\_&\\_Abundance/](http://www.nbii.gov/portal/community/Communities/Ecological_Topics/Bird_Conservation/USFWS_Focal_Species/Golden-winged_Warbler/Distribution_&_Abundance/).
- Partners in Flight Bird Conservation Plan, Allegheny Plateau  
[http://www.partnersinflight.org/bcps/plan/pl\\_24\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf).
- Golden-winged Warbler Atlas Project  
<http://www.birds.cornell.edu/gowap/why.html>.
- Golden-winged Warbler Conservation Initiative.
- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003).  
[http://www.partnersinflight.org/bcps/plan/pl\\_18\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_18_10.pdf).
- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005).  
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- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region 13 (Atlantic Coast Joint Venture 2007).  
[http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004).  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm).
- A Plan for Conserving Grassland Birds in New York,” Final Report to NYSDEC (Morgan & Burger 2008).  
<http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf>.

# Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

## Indiana Bat Species Action Plan

### FOCAL AREA: ST. LAWRENCE

*Other species benefitting:*

eastern small-footed, little brown, tri-colored, northern, big brown

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h (diameter at breast height). Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at <http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf>.

Streams associated with floodplain forests and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.*, old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service [USFWS] 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

**Justification for species selection:** The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

**State contribution to overall species population:** New York used to have ~11% of wintering Indiana bats rangewide before White-nose syndrome (WNS). New York still has the largest number of wintering (and likely summering) Indiana bats in the region. The USFWS has

## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

proposed recovery units in the draft recovery plan (Plan) (USFWS 2007) and New York is part of the Northeast Recovery Unit.

### Threats and threat assessment:

Threats<sup>24</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** *See the Plan for in-depth discussion (USFWS 2007, page 71).*

- A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) have been identified as long-standing and ongoing threats to the species.
- B. Winter – potential to impact hibernacula with gas drilling, filling, etc.
- C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development
- D. Fall (swarming) – same pressures as spring/summer habitat

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** *See the Plan for in-depth discussion (USFWS 2007, page 80).*

- A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

**Factor C. Disease or predation:** WNS is most significant threat in New York. Predation is also a threat.

**Factor D. The inadequacy of existing regulatory mechanisms:** *See the Plan for in-depth discussion (USFWS 2007, page 90).*

- A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

**Factor E. Other natural or man-made factors affecting its continued existence:** *See the Plan for in-depth discussion (USFWS 2007, page 91).*

- A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.
- B. Anthropogenic factors that may affect the continued existence of Indiana bats include

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<sup>24</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and polychlorinated biphenyls [PCBs]), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

### *Recovery Goals*

**Range-wide Recovery Goals/Objectives:** Intermediate - reclassification, Long-term - delisting

**Conservation goal(s) for New York State:** The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit.

### **Research/Actions needed:**

- A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions – not included in recovery plan – WNS will eventually have a separate plan).
- B. WNS-related research is needed to better understand the threat.
  - 1. Assist with requests for proposals (RFPs) as requested (Endangered Species Act [ESA]).
  - 2. Review proposals if requested to be on review team (ESA).
  - 3. Provide grant oversight for FY08 and FY09 projects (FY2011-2012) (ESA).
  - 4. Assist with field work (FY2011) (ESA).
- C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6)
  - 1. Assist with Indiana bat modeling shared decision-making (SDM) effort until completion (ESA)
    - a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3) (FY11)
    - b. Participate in calls during Beta testing (FY11)
    - c. Attend workshop to test model (FY11)
    - d. Assist with roll-out of model (FY11)
    - e. Provide technical assistance to Field Offices (FOs) with use of model (FY11,12,13)
- D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4)

## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

1. Environmental Contaminants (EC) WNS research - send all samples out for analysis (FY11, EC)
2. Prepare 2009 bat mercury Natural Resource Damage Assessment and Restoration (NRDAR) report for Onondaga Lake (FY11, EC)

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (USFWS 2007)
- Last 5-year review completed 2009 (USFWS 2009)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Assist R3 with finalizing Recovery Plan as requested (FY11, NYFO ESA)
- B. Reduce current threats at known hibernacula (primarily WNS-related actions - not included in recovery plan - WNS will eventually have a separate plan) (Recovery Action 1.1.1)
  1. WNS National Plan
    - a. Provide technical assistance during USFWS and/or public review periods (FY2011) (ESA)
    - b. Participate in Communications Group (FY2011,12,13, NYFO ESA)
  2. WNS-related research is needed to develop conservation strategies to respond to WNS.
    - a. Assist with captive bat management structured decision making process (FY10, 11, NYFO ESA)
- C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.
  1. Participate in multi-region project to develop guidance (FY10,11, NYFO ESA)
  2. Coordinate first R3, Regions 4 and 5 (R4, R5) threatened and endangered species wind call - 2/3 (FY10)[completed]
  3. Participate in multi-region calls (FY10-13, NYFO ESA)



## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

- D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)
  - 1. Assist R3 with this effort
- E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)
- F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)
  - 1. Assist with funding automation of acoustic survey data analysis
    - a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system (FY10,11) (ESA)
    - b. Assist with Phase 1 grant agreement (FY10)[completed]
  - 2. Determine whether netting guidelines should be revised to include acoustic detectors
    - a. Participate in Indiana bat/Wind Initiative protocol workgroup (FY10)[completed]
    - b. Participate in team to revise Indiana bat survey protocols as requested (FY11) (ESA)
- G. Assist New York State Department of Environmental Conservation (NYSDEC) with acoustic transect project
  - 1. Conduct 1 acoustic transect route 2-3 nights (FY10)[completed]
  - 2. Conduct 1 acoustic transect route 2-3 nights (FY11, NYFO any program; ESA to coordinate)
- H. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)
  - 1. Fund or otherwise coordinate wind project research
    - a. Flight altitude?
    - b. Migratory pathways?
    - c. Impacts of wind turbines on resident v. migrating bats?
    - d. Minimization/mitigation measures?
    - e. Post-construction monitoring techniques?
- I. Regional coordination role

## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads (FY11) (ESA)
2. Potential outcomes:
  - a. Provide updates to FOs on literature, information from other regions
  - b. Provide technical assistance to FOs on formal consultations/Habitat Conservation Plans (HCPs)
  - c. Provide R5 comments on national issues (e.g., survey protocol updates)
  - d. Provide R5 end-of-year reporting info to R3
  - e. Maintain understanding of current literature
  - f. Participate in WNS-related projects as needed

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)
  1. Army Compatible Use Buffer (ACUB) program has been initiated at Fort Drum. This is a great opportunity to target lands for protection that meet Town, Army, and conservation goals. Partners include Army, Ducks Unlimited (DU), Ontario Bays Initiative (OBI), NYSDEC
    - a. Participate in meetings/calls to target Indiana bat lands (FY11-13) (ESA)
    - b. Provide technical assistance to Fort Drum with easement language (FY11, NYFO ESA)
    - c. Complete consultation on ACUB program (FY11, NYFO ESA)
- B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)
  1. Fort Drum
    - a. Ensure implementation of conservation measures of existing Biological Opinion (BO) (also see Action 2.6)
    - b. Participate in semi-annual Natural Resources Branch Meetings
      - i. Attend at least one in person and one over the phone (FY10,11,12) (ESA)

## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

- c. Recognize the Army for assisting with recovery actions
    - i. Nominate for Military Partnership Award - January 2010 (FY10)[completed-not awarded]
    - ii. Send recognition letter to Army (FY11) (ESA)
  - d. Assist Fort Drum with WNS research/monitoring
    - i. Assist with summer transmission study
    - ii. Assist with capture and processing of bats at condo 1-3 nights (FY10,11, NYFO ESA)
- C. Encourage habitat protection through acquisition/easements
- 1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants
  - 2. Provide technical assistance to the Natural Resources Conservation Service (NRCS) for potential easements
- D. Minimize adverse impacts to Indiana bat during project reviews (Recovery Action 2.6)
- 1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor
    - a. Review annual reports from
      - i. Fort Drum (FY10-13, NYFO ESA)
      - ii. Fort Drum Connector (FY10,11,12, NYFO ESA)
  - 2. Habitat protection through informal and formal consultations and HCPs (NYFO ESA).
    - a. Assist with development of measures for NiSource HCP (ESA)
    - b. Develop conservation framework, including standard conservation measures, for residential and commercial projects (ESA)
    - c. Complete St. Lawrence Wind consultation (ESA)
    - d. Participate in consultation with Fort Drum (FY2011, NYFO ESA)

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** No work planned for FY 2011.

**Factor C. Disease or predation:** Need to determine what conservation measures will be available for WNS-response.

# Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

## Factor D. The inadequacy of existing regulatory mechanisms:

- A. Review NYSDEC permit conditions (FY11) (ESA)
- B. Coordination Regional review of Indiana bat permit conditions (ESA)

**Factor E. Other natural or man-made factors affecting its continued existence:** Wind project work being addressed through consultations/HCPs (see above)

## OUTREACH

- A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat including development of guidelines, best management practices (BMP), land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)
- B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)
  - 1. Current Indiana bat/WNS display
    - a. Continue to rotate display at nature center (any NYFO program; ESA to coordinate)
    - b. Update display at least once/year (ESA)
  - 2. New Indiana bat display
    - a. Provide technical assistance to the U.S. Forest Service (USFS) in the development of a new display (ESA)
    - b. Receive transfer funding from USFS and develop contracts to complete display (FY2011, Cost:\$10-15,000 [\$5,000 from USFS, rest from WNS and NYFO]) (ESA)
  - 3. New Indiana bat cave display
    - a. Develop new cave display (FY2012, Cost: \$1000)
  - 4. Attend meetings/workshops
- C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to

## Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)

1. Update Fact Sheets and web materials (NYFO ESA and R5) (FY10,11)

D. Assist with Freedom of Information Act (FOIA) responses as needed

### MONITORING

A. Survey winter populations of Indiana bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

1. Assist NYSDEC with 2010 hibernacula surveys (FY10)[completed]

2. Glen Park

3. Assist NYSDEC with “Indiana bat on year” winter 2010-2011 surveys (FY11) (ESA, staff costs)

4. Glen Park (St. Lawrence focal area)

B. Review and track recovery progress.

### *Partners*

Partners - NYSDEC, R3, R4, R5 FOs, Montezuma National Wildlife Refuge (NWR), U.S. Army, USFS, New York State Department of Transportation (NYSDOT), Federal Highway Administration (FHWA), OBI, DU, USGS

### *References*

U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 600 pp. (This document has been peer-reviewed and is available at <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.

# Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

## Lake Sturgeon Species Action Plan

**FOCAL AREA: ST. LAWRENCE**

*Other species benefitting:*

American eel, walleye, redhorse/white suckers, mooneye

## BIOLOGICAL PLANNING

### *Introduction to species*

**Species information:** Lake sturgeon is a long-lived, late-maturing species that inhabits large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins. Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warm water species with water temperature and depth preferences of low 50s to mid-60°F and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Life history characteristics of lake sturgeon are unique with respect to other fishes. Females mature between 14 and 33 years, males between 8 and 12 years. Spawning occurs only once every 2-7 years for males and 4-9 years for females. As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population spawns during a given season. Spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-60°F. The typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

**Justification for species selection:** In the past, sturgeon have comprised an important biological component of the Great Lakes fish community. By the early 1900s many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and reduced water quality. Within the Great Lakes basin, the lake sturgeon population is estimated to be at 1% of historic abundance levels. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. In New York State and the Province of Ontario, lake sturgeon are listed as a threatened species. In addition, the lake sturgeon is a Federal trust species and has been identified as a priority species under the New York Field Office (NYFO) - Fish Enhancement, Mitigation, and Research Fund (FEMRF).

**State contribution to overall species population:** Currently there are remnant populations of lake sturgeon occurring in Upper Niagara River/Lake Erie, Lower Niagara River, St. Lawrence River (middle corridor), St. Lawrence River (lower corridor), and the Grasse River. Among these remnant populations we see varying population trends, ranging from populations that are recovering to populations that remain very low, but apparently stable. Within the State, the populations maintaining themselves today are recognized as being in five geographic units, contrasted to more than 12 units historically. The New York State Department of Environmental Conservation (NYSDEC) Lake Sturgeon Recovery Plan states the goal of maintaining these

## **Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area**

5 units and restoring populations in three other units. The NYSDEC has stocked 6 waterbodies in efforts to establish populations in three other units.

### **Research needed:**

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC, U.S. Geological Survey [USGS], Ontario Ministry of Natural Resources [OMNR], and U.S. Fish and Wildlife Service [USFWS] (Lower Great Lakes Fish and Wildlife Conservation Office [LGLFWCO/NYFO]) to assist with lake sturgeon surveys to determine presence/absence and population densities, coupled with habitat investigation and evaluation of stocking initiatives; Cost: NYFO staff time)

- Complete a New York State Lake Sturgeon Management Plan.

(Who: USFWS [NYFO], NYSDEC, USGS, and Cornell University to assist with completion of New York State Lake Sturgeon Management Plan to address recovery, habitat restoration strategies and population goals; Cost: < \$40K, NYFO FEMRF funding)

### **Threats and threat assessment:**

#### **1. Loss of Spawning Habitat.**

##### **Research needed:**

- Conduct surveys to determine quantity and quality of known spawning habitat.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: NYFO staff time)

- Identify and prioritize areas for habitat restoration and enhancement.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, FEMRF funding)

#### **2. Barriers to Migration (including dams and impassable culverts).**

##### **Research needed:**

- Identify barriers having an influence on lake sturgeon spawning migration and prioritize barrier removal.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, FEMRF funding)

## **Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area**

- Conduct surveys to determine available sturgeon spawning habitat above existing barriers, in regards to both quantity and quality of habitat present.

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost : unknown at this time, FEMRF funding)

### **3. Contaminants.**

#### **Research needed:**

- Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically the effects from polychlorinated biphenyls (PCBs), mirex, dioxin, mercury, and emerging contaminants.

(Who: USFWS [NYFO-Environmental Contaminants (EC)]; Cost: unknown at this time, Natural Resource Damage Assessment and Restoration [NRDAR], Great Lakes Restoration Initiative [GLRI], FEMRF funding)

### **4. Invasive Species (and associated disease transmission).**

#### **Research needed:**

- Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.

(Who: USGS, academics; Cost: unknown at this time, FEMRF funding)

### **5. Climate change; changes in riverine discharge regimes.**

#### **Research needed:**

- Identification of climate change related impacts to lake sturgeon.

(Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

#### *Partners/potential funding*

USFWS (LGLFWCO), USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, New York Power Authority (NYPA), Cornell University, State University of New York-College of Environmental Science and Forestry (SUNY-ESF).

#### *Population goal(s) for New York State:*

Currently, several agencies have published three population goals for lake sturgeon in the Lake Ontario/St. Lawrence River basin and these goals vary. The NYSDEC Lake Sturgeon Recovery



## **Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area**

Plan states the goals are to increase the number of naturally reproducing sturgeon populations in New York to 8 (up from 5) and the removal of the species from State-listing. The Great Lakes Fishery Commission stated goals are the rehabilitation of lake sturgeon populations including the expansion of sturgeon populations into favorable habitats and to enhance sturgeon spawning habitat. Their metric for success is based on a catch per unit effort (CPUE) of 0.1 sturgeon/net/night; CPUE rates observed from 2000 to 2007 ranged from 0 to 0.06 sturgeon/net/night. The OMNR, in a draft Lake Sturgeon Rehabilitation Plan, state goals as conserve and/or rehabilitate the existing self-sustaining lake sturgeon spawning populations with a minimum target of at least 750 sexually mature sturgeon in each system. This number was selected because it represents the minimum number thought to be present in remnant Great Lakes populations that are considered to be either stable or increasing in abundance. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Lake Ontario/St. Lawrence River basin.

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

##### **1. Loss of spawning habitat.**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
- b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (Partners for Fish and Wildlife [PFW] and NYPA).
- c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations.
- d. Promote habitat restoration projects that control sediment entering riverine environments and reduce quality of spawning habitat.
- e. Conduct surveys to determine current population levels and presence/absence.
- f. Facilitate reintroduction of lake sturgeon to their known former range.

##### **2. Barriers to migration (including dams and impassable culverts).**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
- b. Work with partners to identify, prioritize, and remove sturgeon barriers

## **Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area**

- c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.

### **3. Contaminants.**

- a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants.
- b. Continue to manage St. Lawrence River NRDAR case.
- c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

### **4. Invasive Species (and associated disease transmission).**

- a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.

### **5. Climate change; changes in riverine discharge regimes.**

- a. Identify potential effects to lake sturgeon spawning habitat and water quality.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY2010-2012

### **1. Loss of spawning habitat and habitat function.**

- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
  - i. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon \(Conservation Planning Assistance \[CPA\]\).](#)
- b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (PFW and NYPA).
  - i. [Work with NYPA to locate and place up to two spawning substrate beds below the St. Lawrence Power Project \(NYPA- Habitat Improvement Project funding\) \(CPA\).](#)
  - ii. [Work with NYFO-PFW and NYSDEC to identify locations to place spawning substrate beds in tributaries to the St. Lawrence River \(NYFO FEMRF funding\) \(FEMRF, PFW\).](#)

## Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

- iii. Manage St. Lawrence Environment NRDA case and consider lake sturgeon restoration projects in settlement negotiations regarding that case (EC).
  - c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations.
    - i. Develop NYFO FEMRF Geographic Information Systems (GIS) Decision Support Tool to focus preservation efforts. Kick-off meeting scheduled for January 26/27 (NYFO FEMRF funding) (FEMRF).
    - ii. Work with Thousands Islands Land Trust (TILT) and Save the River to identify parcels to preserve (NYFO FEMRF funding).
  - d. Promote habitat restoration projects that also control sediment entering riverine environments.
    - i. Work with USDA-NRCS to focus their programmatic efforts to reduce sediment input and agricultural run-off (USDA-NRCS funding).
  - e. Conduct surveys to determine current population levels and presence/absence.
    - i. Assist NYSDEC and USGS with surveys to determine current population levels of lake sturgeon and determine presence/absence of the species (FEMRF).
  - f. Facilitate reintroduction of lake sturgeon to their known former range.
    - i. Facilitate the writing of a New York State Lake sturgeon management plan (FEMRF funding) (NYSDEC, USGS, FEMRF).
    - ii. Assist the NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation. NYFO-FEMRF to provide equipment, assistance with Investigational New Animal Drugs (INAD) permits, and field assistance. (FEMRF funding) (FEMRF).
    - iii. Assist the NYSDEC with 5-year population assessments through providing field assistance and PIT tagging supplies (FEMRF funding, , \$10K) (FEMRF).
- 2. Barriers to migration** (including dams and impassable culverts).
- a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.
    - i. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA).

## Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

- ii. In addition, provide passage recommendations related to the relicensing of hydroelectric power generating facilities on tributaries to the St. Lawrence River, specifically the Oswegatchie River (Eel Weir Dam and Heuvelton Dam) (CPA).
- b. Work with partners to prioritize, identify, and remove sturgeon barriers.
  - i. Develop FEMRF GIS Decision Support Tool to prioritize tributaries for restoration activities (FEMRF funding) (FEMRF).
  - ii. NYFO PFW to conduct multi-year barrier assessments on 3 tributaries of the St. Lawrence River per year and make recommendations for removal (USFWS Fish Barrier Assessment and Mitigation Project; FEMRF funding, \$162K) (PFW).
  - iii. NYFO PFW to remove up to 3 fish barriers per year. For FY2011: work on Sucker Brook (FEMRF funding) (PFW).
- c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.
  - i. Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range (NYSDEC, FEMRF).

### 3. Environmental Contaminants.

- a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically polychlorinated biphenyls (PCBs), mirex, dioxin, mercury, and emerging contaminants.
  - i. Facilitate the investigation of the effects of contaminants on the survival and reproductive success of lake sturgeon (FEMRF, NRDAR, GLRI funding).
- b. Continue to manage St. Lawrence River NRDAR case.
  - i. Work with partners and fellow trustee agencies to restore habitat using NRDAR funds associated with the St. Lawrence case.
- c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to lake sturgeon and/or their habitat.

### 4. Invasive Species (and associated disease transmission).

## Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

- a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism.
  - i. No work identified at this time.

### 5. Climate change; changes in riverine discharge regimes.

- a. Identify potential effects to lake sturgeon spawning habitat and water quality.
  - i. Work with National Weather Service to create models for determining climate change related precipitation impacts to spawning habitat and tributaries.

## OUTREACH

### [Host NYS Lake Surgeon Working Group meeting \(FEMRF\).](#)

The New York State Lake Sturgeon Recovery Plan (pending), when complete, will have an outreach component identifying our path forward.

The NYFO has a FEMRF webpage with “ongoing projects” on our website.

Assist NYSDEC with lake sturgeon placard placement and fishermen education.

## MONITORING

- Work with partners to monitor lake sturgeon habitat restoration and enhancement projects, including spawning substrate additions and use of habitat post-removal of barriers.
- Monitor status and contribution to the population of stocked eggs/sturgeon as part of reintroduction strategy.
- Establish benchmarks for success based on New York State Lake Sturgeon Management Plan (pending).

### *Partners*

USFWS (LGLFWCO), USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, NYPA, Cornell University, SUNY-ESF

### *References*

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## **Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area**

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Farrell, J.M., R. Colesante, D. Dittman, J. Johnson. 2009. Lake Sturgeon Population Enhancement as a Strategy for Improvement of Ecosystem Function and Controlling Invasive Species. Final Report. Submitted to the USFWS in fulfillment of a FEMRF award.

# Northern Pike (*Esox lucius*): St. Lawrence Focal Area

## St. Lawrence Focal Area

### Northern Pike Species Action Plan

#### FOCAL AREA: ST. LAWRENCE

*Other species benefitting:*

muskellunge, pugnose shiner, waterfowl/waterbirds

#### BIOLOGICAL PLANNING

##### *Introduction to species*

**Species information:** Northern pike are ambush predators found in freshwater throughout the northern hemisphere. Females mature between 3-4 years, males between 2-3 years. Spawning takes place late March to early April, eggs are broadcast over submergent aquatic vegetation or seasonally flooded terrestrial vegetation.

**Justification for species selection:** Northern pike populations in the St. Lawrence River/Lake Ontario Basin have declined dramatically. Water level regulation related to the St. Lawrence Seaway (Seaway) and St. Lawrence Power Project has resulted in stabilized water levels with reduced spring flooding (both volume and duration). This condition has also potentially facilitated the expansion of invasive cattail resulting in dense, monotypic stands that afford little habitat value for the species. Northern pike are considered an inter-jurisdictional species and have been listed as a priority species by both the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of Natural Resources (OMNR). Consequently, the New York Field Office (NYFO) has listed the species as a priority under the Fish Enhancement, Mitigation, and Research Fund (FEMRF) and with partners, is currently implementing a habitat conservation strategy for the species.

**State contribution to overall species population:** Northern pike are found in freshwater throughout the northern hemisphere, including Russia, Europe, and North America. It has also been introduced to lakes in Morocco and is even found in the brackish water of the Baltic Sea.

Within North America, there are northern pike populations in North Dakota, South Dakota, Minnesota, Michigan, Montana, Maryland, West Virginia, Wisconsin, Indiana, Connecticut, Massachusetts, Vermont, Iowa, northern New Mexico, Arizona, Illinois, New York, New Jersey, Idaho, and northern New England; most of Canada, particularly Alberta, Saskatchewan, Manitoba, Ontario, and Québec (northern pike are rare in British Columbia and east coast provinces), Alaska; and the Ohio Valley, the upper Mississippi River and its tributaries, the Great Lakes Basin and surrounding states, Missouri, Kansas, Nebraska, Colorado, and parts of Oklahoma. They are also stocked in, or have been introduced to, some western lakes and reservoirs for angling purposes, although this practice often threatens other species of fish such as bass, trout, and salmon causing government agencies to exterminate the northern pike by poisoning the lakes.

##### **Threats and threat assessment:**

# Northern Pike (*Esox lucius*): St. Lawrence Focal Area

## St. Lawrence Focal Area

1. **Water level regulation** associated with the Seaway and hydropower development.
2. **Habitat loss** - stabilized water levels that have allowed invasive cattail to form dense, monotypic stands of little habitat value and timed to prevent overwintering of muskrats which may naturally control density of cattails.

### Research needed:

- Surveys to establish baseline population levels and to set goals for restoration of population.

3. **Habitat loss** – barriers (culverts) preventing access to suitable spawning/nursery areas and cutting off flow to parts of marshes.

### Research needed:

- Surveys to determine available spawning habitat (quality/quantity).
- Discern population movement of northern pike along the river; if discreet populations exist, should be reflected in translocation/stocking program if implemented.

4. **Land use practices/stream bank erosion** – increases nutrient/sediment input reducing suitable SAV (replaced with lower quality SAV, invasive species, filamentous algae) and reducing water quality in embayments.

### Research needed:

- Genetics work to determine if discreet populations exist in different areas of the river.

5. **Invasive species.**

### Research needed:

- Investigate impacts associated with invasive species and contaminants, currently limited information available.

6. **Contaminants.**

### Research needed:

- Fish health studies needed to determine:
  - Cause of skewed ratio of males/females.
  - Decreased sperm production in males.
- Contaminants - Assess the effects of contaminants on northern pike, especially at Great Lakes Areas of Concern (AOCs) and Confined Disposal Facilities. (Who:



# Northern Pike (*Esox lucius*): St. Lawrence Focal Area

## St. Lawrence Focal Area

- Determine impacts related to invasive species and contaminants.

### 7. **Climate change** - potential to affect spawning habitat and egg/fry survival.

#### *Partners/potential funding*

NYSDEC, OMNR, U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), State University of New York – College of Environmental Science and Forestry (SUNY-ESF), New York Sea Grant (NYSG), Ducks Unlimited (DU), Save The River (STR), Thousand Island Land Trust (TILT)

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Address water level regulation effects associated with Seaway and hydropower development.**

- a. Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan (CPA/FEMRF).
- b. Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g., U.S. Army Corps of Engineers [USACE] 404 permits, Federal Energy Regulatory Commission [FERC] relicensing, and license compliance work) (CPA/FEMRF).
- c. Provide substantive comments on the following projects with the conservation of northern pike and their recovery as one of our foci (CPA/FEMRF):
  - i. Massena Electric Department (proposed hydropower).
  - ii. Eel Weir Dam (hydropower relicensing).
  - iii. Heuvelton Dam (hydropower relicensing).

#### **2. Address habitat loss due to stabilized water levels that have allowed invasive cattail to form dense, monotypic stands with little habitat value.**

- a. Continue efforts with partners to effect positive habitat change.
  - i. FEMRF –
    - Implement all phases of the Fish Habitat Conservation Strategy (PFW).

## **Northern Pike (*Esox lucius*): St. Lawrence Focal Area**

### **St. Lawrence Focal Area**

- Continue FEMRF efforts towards pursuing and funding sound proposals that would contribute to northern pike recovery (FEMRF, PFW).
  - Work with FEMRF funded contractors to determine marshes with highest potential (FEMRF, PFW).
  - Promote/plan/fund marsh evaluations/public outreach (PFW).
- ii. Coordinate efforts with other organizations/agencies to address habitat loss due to stabilized water levels (PFW).
  - iii. Work with partners to identify tools; evaluate whether tools are having desired results.
  - iv. Participate in Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership (PFW, FEMRF).
  - v. Attend meetings with other organization/agencies to gain insight into their efforts towards northern pike habitat restoration (e.g., American Fisheries Society [AFS]) (CPA, FEMRF).
- 3. Address habitat loss due to stream barriers that prevents access to suitable spawning/nursery areas and prevents adaptation to climate change and warmer water temperatures.**
- a. Continue Fish Barrier Assessment & Mitigation project (FEMRF, PFW).
  - b. Initiate Stream Habitat Survey/Fish Response project proposal; working in conjunction with Fish Barrier Assessment & Mitigation project (FEMRF, PFW).
- 4. Address poor land use practices that degrade water quality and fish habitat (i.e. increased nutrient/sediment input, reduced suitable submergent aquatic vegetation, invasive species, and filamentous algae).**
- a. Work in conjunction with the NRCS and the local Soil and Water Conservation District to provide technical assistance on agricultural best management practices (BMPs), including cattle exclusion fencing and stream bank restoration in the watershed (PFW).
  - b. Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g., NRCS State Technical Committee) (CPA).
- 5. Invasive Species.**
- 6. Contaminants.**
- a. Evaluate and prioritize U.S. Fish and Wildlife Service (USFWS) Natural Resource Damage Assessments (NRDA) along the Great Lakes.

# Northern Pike (*Esox lucius*): St. Lawrence Focal Area

## St. Lawrence Focal Area

- b. As part of the Great Lakes Restoration Initiative (GLRI), evaluate emerging contaminants at the Rochester Embayment AOC (potentially FY 2010 – 2014).
- c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
- d. Other strategies may result from research need noted above.

### 7. Climate Change.

*Partner organizations:*

NYSDEC, OMNR, USDA-NRCS, SUNY-ESF, NYSG, DU, STR, TILT

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Address water level regulation effects associated with Seaway and hydropower development.**
  - a. No work identified at this time.
2. **Address habitat loss due to stabilized water levels which have allowed invasive cattail to form dense, monotypic stands with little habitat value.**
  - a. Continue efforts with partners to effect positive habitat change (FEMRF, SUNY-ESF, DU, TILT).
    - i. Complete Blind Bay project (PFW).
      - Construct four culverts across two causeways in Blind Bay – FY 2011 (\$50,000). (Completed)
      - Using amphibious excavator, construct sinuous channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat.
      - Create oxbow like sections of the new channels to encourage carex/juncus species diversity. See “monitoring” for monitoring component.
    - ii. Continue work in French Creek marsh to open up mono-typical stand of typha to increased flow/provide access to the marsh by northern pike. For FY2011: 2,320 feet. (2011 – 2013 (PFW).
    - iii. Start work on Grindstone Island projects (PFW).

## **Northern Pike (*Esox lucius*): St. Lawrence Focal Area**

### **St. Lawrence Focal Area**

- Club Island – re-open channels connecting Flynn Bay with St. Lawrence River.
  - Delaney Bay marsh – re-open historic channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat (PFW).
- 3. Address habitat loss due to stream barriers which: prevent access to suitable spawning/nursery areas and prevents adaptation to climate change and warmer water temperatures.**
- a. Continue Fish Barrier Assessment & Mitigation project. FY 2011 – 2013 (\$167,000) (PFW). FY2011 work on three stream systems: Barretts, Mullett, Brandy
    - i. Mitigate significant barriers.
    - ii. Work to obtain funding for Stream Habitat Survey/Fish Response project.
- 4. Address poor land use practices which degrade water quality and fish habitat (i.e. increased nutrient/sediment input, reduced suitable submergent aquatic vegetation, invasive species, and filamentous algae).**
- a. No work identified at this time.
- 5. Invasive Species.**
- a. No work identified at this time.
- 6. Contaminants.**
- a. Evaluate and prioritize USFWS NRDA's along the Great Lakes.
    - i. Manage St. Lawrence NRDA River case; consider northern pike restoration projects in settlement negotiations regarding the case (FY 2010 - 2013) (EC).
  - b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC (potentially 2010 – 2013).
    - i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment AOC to determine potential impacts to fish and wildlife Trust resources and their supporting habitats, with potential for including the St. Lawrence AOC in subsequent years. (FY 2010-2013) (EC)
    - ii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependant on USEPA funding: FY 2011-2013) (EC).

## **Northern Pike (*Esox lucius*): St. Lawrence Focal Area**

### **St. Lawrence Focal Area**

- c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
  - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to northern pike and/or their habitat (FY 2010-2013) (CPA).
- d. Other actions may result from research need noted above.

#### **7. Climate Change.**

- a. No work identified at this time.

### **OUTREACH**

Partner agency NYSG – Fish Habitat Fact Sheet Series (FEMRF funded product as part of Fish Habitat Conservation Strategy).

Assist landowners in identifying suitable habitat on their properties, threats to those habitats, and references for technical assistance in implementing habitat improvement projects (FEMRF, PFW).

Media news release – work with Regional Office to establish media news release and fact sheet detailing projects and information for interested landowners and general public (PFW).

Establish storylines and information on Regional and NYFO webpage, detailing projects and information for interested landowners and general public (PFW).

### **MONITORING**

Done by partner agency SUNY-ESF (see below)

Monitor fish barrier removal effectiveness at Little Sucker Brook (PFW).

- Habitat restoration projects must be evaluated using consistent protocols for measuring “success”, including determining contribution to changes in population numbers.
- Projects need to be monitored to ensure that invasive species do not colonize newly restored habitat.
- Projects need to be monitored to evaluate effectiveness with respect to longevity of reestablishment of diverse native vegetation.
- Coordinate with SUNY-ESF who is conducting monitoring studies on stream/marsh restoration projects.

*References*

## **Northern Pike (*Esox lucius*): St. Lawrence Focal Area St. Lawrence Focal Area**

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## UPPER HUDSON FOCAL AREA

The Upper Hudson Focal Area (UHFA) is located in central-eastern New York and contains approximately 2,941 square miles or 5.4% of the state. The focal area is largely demarcated by the drainage area tributary to the Hudson River above the Rensselaer-Columbia county line, excluding the Mohawk River Basin. The southern portion of Lake Champlain and its immediate tributaries are also included. The UHFA contains the former glacial Lake Albany where, in a widened, irregular Hudson River Valley, is present with a local relief of 25-200 feet. Additionally, the focal area contains the Taconic Foothills and portions of the Taconic Mountains with a local relief of 50-600 feet. Overall elevation ranges are 0-700 feet in the Hudson River Valley and 500-1500 feet in the Taconic Region. This focal area is characterized by the presence of the non-tidal portion of the Hudson River, formerly extensive areas of glacially-derived sand plains now represented by the Albany Pine Bush, and generally complex, varied topography where the Mohawk and Hudson River valleys separate the Adirondack, Catskill, and Taconic Mountains.

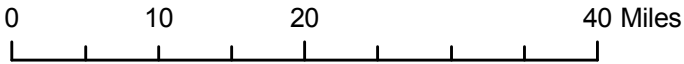
The Hudson River stretches from the Adirondack Mountains to the Battery in Manhattan and is one of the largest watersheds in the eastern United States. More than 8,000,000 people live within this corridor, and it has historically been and is currently one of the major transportation and commercial centers in the country. All of, or portions of, seven New York counties are included within the UHFA boundary including Albany, Rensselaer, Schenectady, Saratoga, Washington, Warren, and Essex counties. Approximately 800,000 people live within this focal area, concentrated primarily in the Capital District cities of Albany, Schenectady, and Troy as well as in Saratoga Springs and Glens Falls. Land uses are predominately urban and industrial near the major population centers with associated suburban areas transitioning to agricultural corn and hay production for the dairy industry in the Hudson River Valley. Forest predominates in the surrounding mountains.

This focal area was selected because it contains significant habitats for trust resource and endangered species. There are currently three Federally-listed species (endangered [E], candidate [C]) and five identified species of concern within the focal area. As part of Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Area 17 (Northern Ridge and Valley), this focal area supports significant habitat for waterfowl and waterbirds, including American black duck. In BCR 13, there has been a net loss of 2.3 million acres of early-successional habitats since the 1970s, resulting in declines in bird species dependent upon this habitat type. The UHFA still retains agricultural lands important to these birds, such as American woodcock and field sparrow. New England cottontail (C) also depends upon these early-successional habitats. The Upper Hudson River focal area includes sand plains from glacial Lake Albany that provide habitat for the Karner blue butterfly (E). Forests, forested wetlands, and the variety of other habitats in the UHFA are also important habitats for Indiana bat (E) and the State-listed Blanding's turtle (T). Over 7,000 miles of streams also support remnant populations of once widespread brook trout populations.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss, land conversion, fish barriers, habitat succession, invasive species, decreased habitat complexity, degraded water quality, and climate change. Current projects include the Hudson River Natural Resource Damage Assessment (NRDA), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

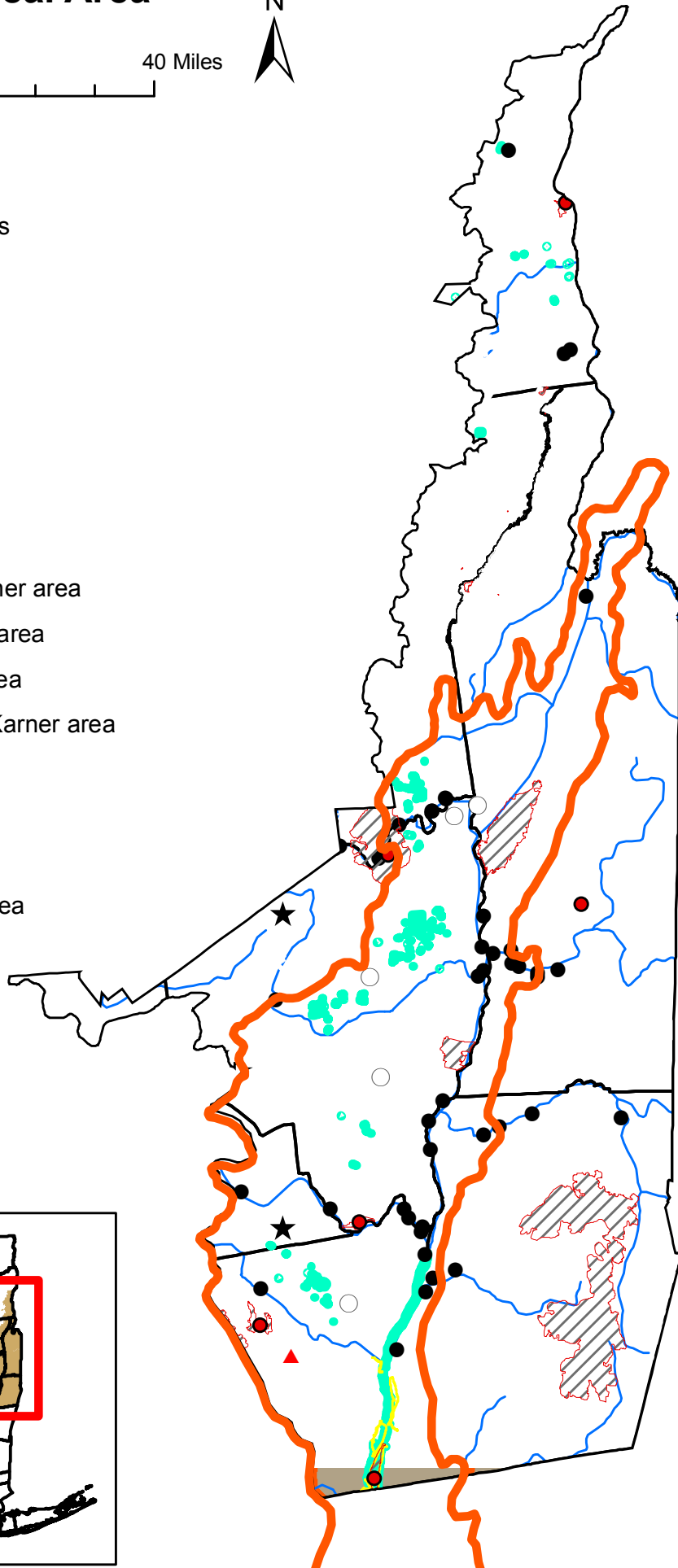
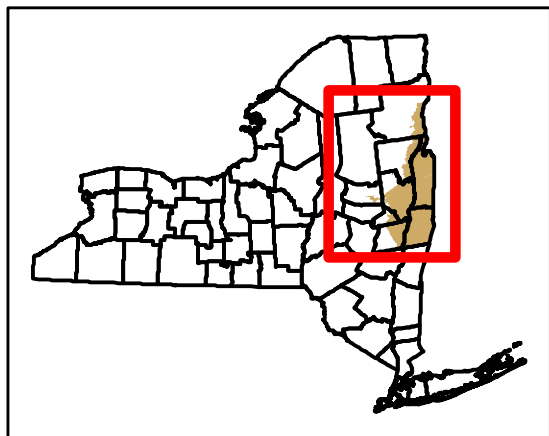


# Upper Hudson Focal Area



## Legend

- Bird conservation areas
- ▲ Hawkwatch sites
- Important bird areas
- NPL Sites
- ★ Wind turbines
- Hydro projects
- Endangered species
- Protected lands
- Albany Pine Bush Karner area
- Saratoga west Karner area
- Queensbury Karner area
- Saratoga Sandplains Karner area
- Karner habitat
- Lakes
- Indiana bat habitat
- Upper Hudson focal area



# American Black Duck (*Anas rubripes*): Upper Hudson Focal Area

## American Black Duck Species Action Plan

### FOCAL AREA: UPPER HUDSON

#### *Other species benefitting:*

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, Greater and lesser scaup, long-tailed duck)

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain including the upper Hudson River Valley), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

**Justification for species selection:** The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR 13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003).

The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

**State contribution to overall species population:** Range extends across New York in freshwater habitat.

#### **Research needed:**

- Develop GIS tools to determine how much habitat remains.

(Who: New York Field Office [NYFO], Ducks Unlimited [DU] to assist with wetland surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

## American Black Duck (*Anas rubripes*): Upper Hudson Focal Area

- Need to complete population modeling and habitat suitability indices to ascertain how much habitat is needed and where.

(Who: U.S. Fish and Wildlife Service [USFWS] [Ralph Tiner] and Buffalo District, U.S. Army Corps of Engineers [USACE]; Cost: unknown at this time)

- Design a regional management program, including increased coordination among managers and biologists, to prevent duplication of research efforts and to share current information (Fish and Wildlife Information Needs System [FWINS]).
- Regional monitoring program to provide better abundance and population trend information needed for secretive wetland birds.

(Who: Audubon, Cornell Lab of Ornithology, NYFO (GIS); Cost: use existing staff)

- Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during breeding.

(Who: State University of New York – College of Environmental Science and Forestry [SUNY-ESF], Audubon, Cornell Lab of Ornithology)

### Threats and threat assessment:

- 1. Loss of habitat and habitat function.** Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

#### Research needed:

- Need to characterize habitat loss.
  - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.
  - Develop GIS tools to determine how much high value habitat remains and how much is needed and where
  - Characterize loss in habitat function (i.e. determine the cause).
  - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.
- 2. Invasive species.** Invasive species, such as *Lythrum salicaria* or *Phragmites australis*, have impacts on wetland habitat, potentially adversely affecting black ducks.

## American Black Duck (*Anas rubripes*): Upper Hudson Focal Area

### Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
  - Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
  - Evaluate effects of invasive plants.
  - Develop GIS tools to determine how much habitat remains free of invasives
  - Need to characterize habitat loss due to invasives (i.e. what is causing it).
3. **Hybridization with mallards.** Hybridization between mallards (*Anas platyrhynchos*) and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

### Research needed:

- Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).
4. **Climate change.** Most existing climate change models predict less runoff and therefore lower water levels in the region.

### Research Needed:

- Assess changes in habitat community structure
  - Determine climate change impacts on prey base during breeding season.
5. **Public use** (recreational disturbances).
6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks.

(Who: Biological Technical Assistance Group [BTAG], New York State Department of Environmental Conservation [NYSDEC], NYFO; Cost: NYFO staff time)

7. **Changes in prey base** during breeding season.

*Population goal(s) for New York State:*

## **American Black Duck (*Anas rubripes*): Upper Hudson Focal Area**

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

### **Research needed:**

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for Great Lakes in New York.

## **CONSERVATION DESIGN**

### ***Strategies for addressing the threats***

#### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit black ducks.
- c. Participate in the New York State Wetlands Forum (NYSWF) to coordinate wetland restoration/protection activities that would benefit black ducks.
- d. Consider black duck habitat restoration when developing Hudson River Natural Resource Damage Assessment and Restoration (NRDAR) case.
- e. Facilitate habitat preservation through coordination with land trusts.
- f. Preserve, restore, and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.
- g. Protecting all remaining habitat. Use GIS or develop new tools to help identify and target, especially the wetlands that have the highest potential to produce black ducks.

#### **2. Loss of habitat function (values diminished).**

- a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

#### **3. Invasive Species**

## **American Black Duck (*Anas rubripes*): Upper Hudson Focal Area**

- a. Target invasive species control projects on wetland sites that would benefit black ducks. Seek to minimize success of invasives colonization in habitat along Upper Hudson River.
- b. Determine how agency water management schedules may impact colonization of invasive species.

### **4. Environmental contaminants.**

- a. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Loss of habitat.**

- a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands by:
  - i. [Meet with Natural Resources Conservation Service \(NRCS\) to assess potential Wetland Reserve Program \(WRP\) sites in Washington County \(Partners for Fish and Wildlife \[PFW\]\)](#).
  - ii. Developing Fact Sheets and best management practices (BMP) to minimize impacts to black ducks.
  - iii. Posting these Fact Sheets/BMP on our website.
  - iv. Writing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
  - v. Developing a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.
  - vi. Working with partners and fellow trustee agencies, identify habitat that could be restored using NRDAR funds associated with the Hudson River case.
- b. Influence regulatory agency decisions regarding siting, construction, and operation of wind turbines proposed for the Great Lakes watershed by:
  - i. Developing Fact Sheets and BMP to minimize impacts to black ducks and other waterfowl.

# American Black Duck (*Anas rubripes*): Upper Hudson Focal Area

- ii. Posting these Fact Sheets/BMP on our website.
2. **Loss of habitat function** (values diminished).
  - a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:
    - i. Developing Fact Sheets and BMP to minimize impacts to black ducks.
    - ii. Posting these Fact Sheets/BMP on our website.

Writing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
3. **Invasive species.** Project ideas can be developed once more information is available about causes of and remedies to invasives species invasion.
4. **Environmental contaminants.**
  - a. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.
    - i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to black ducks and/or their habitat (2010 – 2013; CPA).
    - ii. Manage assessment for USFWS for the Hudson River NRDAR; monitor waterfowl PCB levels and determine potential injuries (Environmental Contaminants [EC]).
    - iii. Coordinate Hudson River PCBs Site BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA (2011 – 2013 [EC]).

## *Partners/potential funding*

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), NRCS, NYSDEC, County Soil and Water Conservation Districts (SWCD), TNC, DU, Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), universities.

## **OUTREACH**

- Landowner education
- Public involvement - Create Outdoor Classroom wetland projects in the Upper Hudson watershed

# American Black Duck (*Anas rubripes*): Upper Hudson Focal Area

## MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future black duck population restoration activities.

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Zimpfer, N.L., Rhodes, W.E., Silverman, E.D., Zimmerman, G.S., and M.D. Kone. 2009. Trends in Duck Breeding Populations, 1955-2009. USFWS, Laurel, MD



## **American Black Duck (*Anas rubripes*): Upper Hudson Focal Area**

<http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Trends/Trend%20Report%202009.pdf>.

Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000). ([http://www.blm.gov/wildlife/plan/pl\\_18\\_10.pdf](http://www.blm.gov/wildlife/plan/pl_18_10.pdf)).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007). ([http://www.acjv.org/BCR\\_13/BCR13\\_Final\\_Plan\\_July07.pdf](http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)).
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# American Woodcock (*Scolopax minor*): Upper Hudson Focal Area

## American Woodcock Species Action Plan

### FOCAL AREA: UPPER HUDSON

#### *Other species benefitting:*

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle, New England cottontail

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

**Justification for species selection:** Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked “High” (H) on the BCR 13 list of “Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture”. It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a “Bird in Trouble” in the Eastern Forest in the North American Bird Conservation Initiative’s 2009 report, “The State of the Birds, United States of America.”

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

## **American Woodcock (*Scolopax minor*): Upper Hudson Focal Area**

**State contribution to overall species population:** Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can be found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

### **Threats and threat assessment:**

- 1. Loss of habitat and habitat function.** The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).
- 2. Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

### **Research needed:**

- Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).
- 3. Contaminants.** Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009). Other contaminants also may adversely affect this species.
  - 4. Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.

# **American Woodcock (*Scolopax minor*): Upper Hudson Focal Area**

## **Research needed:**

- Research is needed to determine the effects of climate change on this species.

## ***Population goal(s) for New York State:***

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

## **Management Objectives for the Population:**

- Halt population declines by 2012 as measured by Singing Ground Surveys
- Have positive population growth by 2022

Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

## **Overall Goal:**

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

## **Management Objectives for Habitat for This Species:**

- Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)
- To increase early successional habitat by 2022

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

# **American Woodcock (*Scolopax minor*): Upper Hudson Focal Area**

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

## **1. Loss of habitat and habitat function.**

- a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.
  - i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.
  - ii. Work with land trusts to target woodcock conservation.
  - iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).
  - iv. Use geospatial tools to:
    - Analyze existing areas of habitat to determine potential breeding areas;
    - Analyze breeding bird survey data to focus efforts; and,
    - Create map for possible woodcock sites of concern.

## **2. Decline in food supply.**

- a. Strategy will depend upon results of research need noted above.

## **3. Contamination.**

- a. Strategy will depend upon results of research need noted above.

## **4. Climate change.**

- a. Strategy will depend upon results of research need noted above.

*Partners/potential funding*

# **American Woodcock (*Scolopax minor*): Upper Hudson Focal Area**

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), National Park Service, NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), universities.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY 2010 - 2012

### **1. Loss of habitat and habitat function.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.
- b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.
- c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this species. In developing BMPs, consider the management recommendation of the NAS 2009 (appended to the end of this document).
- d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat.
- e. Provide technical assistance to NRCS for Wetlands Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock.
- f. Work with partners (USC, RGS, NYSDEC, National Wildlife Refuges [NWR], etc.) to enhance/create early successional habitat within the Focal Area.

### **2. Decline in food supply.**

- a. Delivery will depend upon strategy determined from research noted above.

### **3. Contamination.**

- a. [Manage assessment for USFWS for the Hudson River NRDAR; assess avian injury for the Hudson River NRDAR, including peer review of avian studies \(Environmental Contaminants \[EC\]\).](#)

### **4. Climate change.**

- a. Delivery will depend upon strategy determined from research noted above.

# **American Woodcock (*Scolopax minor*): Upper Hudson Focal Area**

## *Partners/potential funding*

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and WMI. Other potential partners include: USGS, NRCS, National Park Service, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, universities.

## **OUTREACH**

[Landowner education during site visits when potential habitat projects are present \(PFW\).](#)

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

[Put Landowners Guide to Woodcock Management up on NYFO web site \(IT\).](#)

Woodcock Conservation Plan notes the following: “Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds.”

## *Potential Outreach Partners*

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, and NGOs.

## **MONITORING**

- Develop protocols to measure success of all conservation delivery activities.

## American Woodcock (*Scolopax minor*): Upper Hudson Focal Area

- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

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- Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish & Wildlife Service, Sunderland, Massachusetts.
- Cooper, T.R., K. Parker, and R.D. Rau. 2008. American woodcock population status, 2008. U.S. Fish and Wildlife Service, Laurel, Maryland. 15 pp.
- Keppie, D.M. and R.M. Whiting, Jr. 1994. American Woodcock (*Scolopax minor*), The Birds of North America Online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/100>.
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- National Audubon Society. 2009. American Woodcock: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 4 March 2010 ([http://ny.audubon.org/PDFs/HRVC\\_AMERICANWOODCOCK.pdf](http://ny.audubon.org/PDFs/HRVC_AMERICANWOODCOCK.pdf)).
- NYS Ruffed Grouse Hunting Log to identify core woodcock habitat <http://www.dec.ny.gov/animals/56849.html>.
- NYSDEC FAQs on Grouse Hunting and Management (with map) <http://www.dec.ny.gov/outdoor/48393.html>.
- NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005 ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).
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## **American Woodcock (*Scolopax minor*): Upper Hudson Focal Area**

D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/) (VERSION: March 2005).

Sepik, G.F., R.B. Owen, and M.W. Coulter. 1981. A Landowner's Guide to Woodcock Management in the Northeast. Moosehorn National Wildlife Refuge. U.S. Fish and Wildlife Service. 25 pp.

Thogmartin, W.E., J.R. Sauer and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. *The Journal of Wildlife Management*. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007)  
[http://www.acjv.org/bcr13\\_plan.htm](http://www.acjv.org/bcr13_plan.htm).
- American Woodcock Conservation Plan (Kelley et al. 2008)  
[http://www.timberdoodle.org/sites/default/files/woodcockPlan\\_0.pdf](http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf).
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm).
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)

Woodcock Management Recommendations (NAS 2009):

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).
- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.
- Encourage native trees and shrubs.
- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.
- Maintain young, dense forest of at least 5 acres for nesting and feeding.
- Maintain grassy areas near water sources for feeding and display grounds.

# **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

## **Blanding's Turtle Species Action Plan**

### **FOCAL AREA: UPPER HUDSON**

#### *Other species benefitting:*

(shrub swamps/marshes/vernal pool habitats) New England cottontail, black duck, wood duck, American woodcock, golden-wing warbler, northern pike, spotted salamanders

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** The Blanding's turtle is a long-lived, late-maturing species that inhabits a wide range of habitats throughout its range, including shrub swamps, marshes, vernal pools, bogs, ponds, lakes, wet prairies, forested wetlands, and low-gradient streams and rivers. Blanding's turtles main range extends disjunctly from southeastern Ontario, adjacent Quebec, and southern Nova Scotia, south into New England, and west through the Great Lakes to western Nebraska, Iowa, and extreme northeastern Missouri. Several disjunct populations occur in the Northeast (eastern New York, eastern Massachusetts, southern New Hampshire, southern Maine, and southern Nova Scotia). These eastern populations have been effectively isolated from the main range for several millennia, are genetically distinct, and may qualify for federal listing as a Distinct Population Segment under the U.S. Endangered Species Act (ESA). Blanding's turtles mature between 14-21 years, and can attain ages greater than 75 years and still reproduce successfully.

In addition, Blanding's turtles use uplands for several parts of their life cycle for nesting, moving among wetlands, basking, aestivation, and possibly feeding. Most individuals move overland (over 3 km) among multiple wetlands throughout the season. In addition, females often move long distances to nesting sites. Habitat, therefore, must be considered in the context of its landscape setting.

Because Blanding's turtles have a generation time of nearly 40 years and population increases take place slowly, recoveries from declines may take many decades or centuries. Therefore, to be effective, conservation efforts must take place well in advance of severe declines.

**Justification for species selection:** Blanding's turtles are State-listed as either threatened or endangered in nine of 15 states where they occur, including three of the four states in the Northeast. In New York, the Blanding's turtle is State-listed as threatened. At the Federal level, the species is not currently listed under the U.S. Fish and Wildlife Service (USFWS) ESA; under the Canada Species at Risk Act, the species is considered threatened (endangered in Nova Scotia).

**State contribution to overall species population:** In New York, Blanding's turtles are known from the following counties: Dutchess, Saratoga, St. Lawrence, Jefferson, Niagara, and Erie. Evidence suggests there are 3 evolutionary significant units (ESU) for Blanding's turtles across their range. Two of these units occur in New York – the St. Lawrence/western New York

## **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

populations and those populations in the Hudson River basin. It is likely that there would be a minimum of two recovery units established in New York, if the species is Federally-listed. With two ESUs, it could be stated that New York's Blanding's turtle population is genetically more diverse than any other State.

### **Threats and threat assessment:**

Threats<sup>25</sup> (see Status Assessment in references):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).
- B. Fragmentation of habitat (connectivity of wetland and upland habitat).

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

#### **Factor C. Disease or predation:**

- A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

#### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

#### **Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

### ***Recovery Goals***

#### ***Conservation goal(s) for New York State:***

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<sup>25</sup> Refers to 5 listing factors A-E in Section 4 of ESA.

## **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

The New York State Department of Environmental Conservation (NYSDEC) is currently writing a Blanding's Turtle Recovery Plan. Although no population goals have been established for New York, the New York Field Office (NYFO) will continue to collaborate with partners to establish target population goals. Empirically determining the status and trends of Blanding's turtles is difficult; this is the result of sparse data and a long generation time for the species. In general, trends must be inferred based upon the species life history and condition/trends of habitat.

### **Research:**

- Extensive surveys to assess known sites and identify new populations.

(Who: NYSDEC, Hudsonia Ltd., New York Natural Heritage Program [NYNHP], State University of New York-Potsdam [SUNY-Potsdam], USFWS; Cost: unknown at this time)

- Conduct genetic analyses needed to address Distinct Population Segment issue before species can be considered for listing.

(Who: NYSDEC, USGS, Hudsonia Ltd., NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

- Conduct study on road designs to reduce adult mortality (underpass or overpass designs, crossing signage).

(Who: NYSDEC, USGS, University of Massachusetts [UMass], Federal Highway Administration [FHWA], New York State Department of Transportation [NYSDOT], Hudsonia Ltd., NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Status Assessment – 2007
- Nova Scotia Recovery Plan – 2003
- Quebec Recovery Plan – 2005

In addition, the NYSDEC is developing a Blanding's turtle recovery plan for New York State (A. Ross).

**Research/Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Assist with development/review of New York State Recovery Plan.

## **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

Recovery Plan is currently being drafted by NYSDEC.

- B. Assist with development/review of Northeast Blanding's Turtle Conservation Initiative. Northeast States recently applied for FY10 multi-State Wildlife Grant (SWG) to develop a conservation plan for Blanding's turtles in the northeast region of the United States and initiate implementation of the plan.
- C. Determine potential role with New England Field Office (NEFO)/NYSDEC.

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012.

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat). Fragmentation of habitat (connectivity of wetland and upland habitat).
  - 1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.
    - a. Draft standard language and compile materials to share with the public (Endangered Species [ESA]).
    - b. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(Conservation Planning Assistance \[CPA\]\).](#)
  - 2. Develop standard avoidance and minimization measures for development projects.
    - a. Develop standard guidelines to minimize development impacts to the Blanding's turtle.
    - b. Educate local government/townships of presence of the species and provide recommendations regarding development guidelines to reduce impacts.
  - 3. Target wetland mitigation projects, including vernal pool creation/restoration.
    - a. [Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species.](#)
  - 4. Work with NYSDOT and FHWA to reduce road mortality.

## **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

- a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA).
5. Work with partners to proactively protect the complexes of wetlands and uplands used by extant populations.
  - a. Work to ensure information on known locations of Blanding's turtles is conveyed to land protection partners and land trusts to focus their efforts (ESA).
6. Participate in New York State Recovery Plan and Conservation Initiative meetings.
  - a. Attend and provide input at NYSDEC Recovery Plan meetings as requested. Assist NYSDEC with development of best management practices (BMP), threat assessment, and mitigation strategies as requested (ESA).
  - b. Provide Service support for 2011 multi-State State Wildlife Grant Blanding's turtle proposal submission, with a priority given to the population genetics research, as requested (ESA).
7. Assist with NYSDEC surveys.
  - a. Coordinate with the NYSDEC to determine survey schedule (ESA).
  - b. Once confirmed, assist with scheduled surveys to determine presence/absence, population levels, and assist with genetic material collection (ESA/NYFO).

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem
  1. No work identified at this time.

### **Factor C. Disease or predation:**

- A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.
  1. No work identified at this time.

### **Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

## **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.
  - a. [Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles \(CPA\).](#)

### **Factor E. Other natural or manmade factors affecting its continued existence:**

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

1. Identify potential effects to the Blanding's turtle from climate change.
  - a. Work with National Weather Service to create models for determining climate change impacts to the Blanding's turtles.

### **OUTREACH**

Develop education and outreach tools- on land protection needs and conservation restriction options for landowners, on turtles crossing roads, on turtles as pets, on life history strategy, and on nesting turtles.

### **MONITORING**

- Work with partners to review and track recovery progress.
- Establish benchmarks for success based on NYS Blanding's turtle Recovery Plan (pending).

#### *Partners*

NYSDEC, NYSDOT, FHWA, USGS, NYNHP, USFWS (NEFO), Hudsonia Ltd., Wilton Wildlife Preserve and Park, The Nature Conservancy [TNC], UMass, SUNY-Potsdam, land trusts, adjacent States.

#### *References*

Status Assessment for the Blanding's Turtle (*Emydoidea blandingii*). 2007. B.W. Compton, Department of Natural Resources Conservation, University of Massachusetts

## **Blanding's Turtle (*Emydoidea blandingii*): Upper Hudson Focal Area**

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# Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area

## Brook Trout Species Action Plan

### FOCAL AREA: UPPER HUDSON

#### *Other species benefitting:*

American eel, American shad, longtail salamander, wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow pH range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in pH caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds within the Allegheny River watershed as highest priority for protection of brook trout populations.

**Justification for species selection:** The brook trout is a highly prized native sport fish, but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations (NGO), and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

## Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area

**State contribution to overall species population:** Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Upper Hudson watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

### Research needed:

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC and Trout Unlimited [TU] to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### Threats and threat assessment:

1. **Loss of habitat and habitat function;** habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

### Research needed:

- Extensive and frequent stream surveys to determine population size.

(Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

- Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

(Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

- Need to locate heritage streams and heritage populations.

(Who: U.S. Geological Survey [USGS], EBTJV, NYSDEC; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

## Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area

### Research needed:

- Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

(Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

- Identify which known barriers are having an influence on brook trout distribution.

(Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

### 3. Competition from non-native salmonids.

#### Research needed:

- Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

(Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### 4. Climate change; increased water temperatures.

#### Research needed:

- Identification of climate change related impacts to brook trout.

(Who: National Weather Service, LCC, academics; Cost: unknown at this time)

### *Partners/potential funding*

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC).

### *Population goal(s) for New York State:*

The EBTJV has numerous conservation goals, including “Conserve, enhance or restore brook trout populations”, and “...to perpetuate and restore brook trout populations throughout their historic range”; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Allegheny watershed. Establishing population goals remains a research need.

# Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.
- c. Facilitate habitat preservation through coordination with land trusts.
- d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.
- e. [Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment \(NRDA\): review fish data and assess status of fish injury; if possible, use NRDA restoration funds to restore and protect streams identified. \(EC 2011\)](#)
- f. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
- g. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

#### **2. Barriers to migration (including dams and impassable culverts).**

- a. Working with partners, identify and remove barriers.
- b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

## **Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area**

- c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

### **3. Competition from non-native salmonids.**

- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

### **4. Climate change; increased water temperatures.**

- a. Design and construct habitat enhancement projects which provide increased flow, stream shading, pool cover, and increased availability of riffle habitat.
- b. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

#### *Partner organizations*

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
  - i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.
  - ii. Post these fact sheets/BMPs on our website.
    - Writing substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA], Environmental Contaminants-Biological Technical Assistance Group to EPA).
    - Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.

## Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area

- Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review. (CPA).
  - Develop stream buffer guidelines/BMP and post on website.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).
- i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).
  - ii. Restoration work via natural stream design on 500 feet of the Onesquethaw Creek (PFW with funding from base funds NRCS, TU, and NYSDOT).
  - iii. Restoration work via natural stream design on 2,000 feet of the Kayaderosseras Creek (PFW with funding from base funds NRCS, TU, and NYSDOT).
  - iv. Restoration work via natural stream design on 1 mile of the Battenkill (Lake Champlain Fish and Wildlife Resources Office [LCFWRO], PFW with funding from base funds, TU, and the Battenkill Alliance).
  - v. Restoration work via natural stream design on 1 mile of the upper reaches of the Hoosic River (PFW with funding from base funds NRCS, TU, and NYSDOT) (2011).
- c. Facilitate habitat preservation through coordination with land trusts or NGO.
- i. Work with NGO (TU, Battenkill Alliance) to identify parcels for protection.
- d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).
- i. Nothing planned at this time.
- e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.



## Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area

- ii. [Kayaderosseras Creek](#)
- iii. [Battenkill](#)
- iv. [Upper Hoosic River](#)

### OUTREACH

In addition to the web site, there is an EBTJV Google Group (<http://groups.google.com/group/ebtjv>).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of “ongoing activities” on our website.

Work with Albany University, or other universities, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project Trout in the Classroom.

### MONITORING

- Work with NYSDEC and LCFWRO; LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.
- Establish benchmarks for success based on EBTJV.
- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.
- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.
- Seek funding and support for monitoring.

#### *Partners*

NYSDEC, NYSOPRHP, TU, County SWCD, TNC, USEPA, U.S. Army Corps of Engineers, Conservation Fund.

#### *References*



## **Brook Trout (*Salvelinus fontinalis*): Upper Hudson Focal Area**

Eastern Brook Trout Joint Venture main website (<http://www.westernbrooktrout.org>).

Eastern Brook Trout Joint Venture data and maps (<http://sain.utk.edu/ebtjv/index.php>).

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (<http://sain.utk.edu/ebtjv/download/priorityscores.php>).

Trout Unlimited Brook Trout Conservation Strategy (<http://www.tu.org/conservation/eastern-conservation/brook-trout>).

New York State Brook Trout Conservation Strategies  
([http://www.easternbrooktrout.org/docs/EBTJV\\_NewYork\\_CS.pdf](http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf))  
([http://www.easternbrooktrout.org/docs/brookie\\_NY.pdf](http://www.easternbrooktrout.org/docs/brookie_NY.pdf)).

# Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

## Field Sparrow Species Action Plan

### FOCAL AREA: UPPER HUDSON

#### *Other species benefitting:*

Brown thrasher, golden-winged warbler, American woodcock, blue-winged warbler, Baltimore oriole, northern flicker, prairie warbler, red-headed woodpecker, song sparrow

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The field sparrow is a common bird in decline. It is a small songbird of eastern North America (found in the U.S. east of the Rocky Mountains), breeding in brushy pastures and second growth scrub. It is a partial migrant with some individuals remaining on or near their breeding grounds in winter while others move farther south. In winter, field sparrows forage in small flocks for grass seeds. Insects (adult and larval) are added to the diet in the breeding season. Field sparrow nests are located near the ground in early spring, later found in small saplings and shrubs. Field sparrow pairs will renest rapidly following predation or desertion. (Carey et al. 2008)

**Justification for species selection:** The field sparrow was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked “High” (H) on the Bird Conservation Region (BCR) 13 list of “Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture”. It is #9 on Audubon’s 2007 list of “The Top Ten Common Birds in Decline”, and ranked in the 2005 Partners in Flight assessment as a species of regional concern (RC) for BCR 13 (and 28 and 30). The field sparrow has been identified as a “Bird in Trouble” in the Eastern Forest in the North American Bird Conservation Initiative’s 2009 report, “The State of the Birds, United States of America.” The Upper Hudson still retains agricultural lands (which have been lost elsewhere throughout BCR 13) that are important to this species.

The population estimate for this species for the U.S. and Canada is 8,200,000 with 235,148 in BCR 13 (Rich et al. 2004). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the field sparrow has exhibited a precipitous decline of 75% over this time period.

**State contribution to overall species population:** Range extends across New York in abandoned field habitats. The species is a confirmed breeder across New York with the exception of the Adirondacks.

#### **Threats and threat assessment:**

- 1. Loss of habitat and habitat function.** The major threat to this species is habitat loss from succession, and from human developments for agriculture, forestry, and buildings

## Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

(National Audubon Society 2010). In BCR 13, since the 1970s, there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats as old fields, shrublands, or young (e.g., sapling or pole-sized) forests have given way to older forests, resulting in declines in bird species such as the field sparrow that are dependent upon this habitat type. Loss of sufficient quality/quantity habitat within the focal area and the function the habitat provides has adversely affected this species. Factors included are: maturation of early succession habitat to forest, lack of fire, early mowing of hayfields that destroys nests and young, and changes in agricultural practices that convert pasture/hay fields to row crops.

### Research needed:

- Research is needed to identify limiting factors for this species during breeding, migration, staging, and wintering. According to Carey et al. (2008), the “largest need is for studies of migration and wintering ecology. Few data exist on foods and feeding ecology of adults, both in breeding and non-breeding seasons. The breeding ecology of local migratory populations is well known over both the short and long term. However, similar studies in other geographic regions would be of comparative benefit. Especially useful might be year-round studies of non-migratory populations in southern portions of the species’ range.”
2. **Invasive species.** Encroachment of invasive species (particularly knapweed [*Centaurea* spp.]) may change vegetation structure and composition, adversely affecting species such as the field sparrow.

### Research needed:

- Research is needed to determine this species’ preference for native woody vegetation versus invasive exotics.
3. **Nest predation.** Field sparrow eggs and young are predated upon by snakes, chipmunks, foxes, weasels, skunks, raccoons, and feral cats, and birds such as blue jay, American crow, and house wren. They also suffer from parasitism by brown-headed cowbirds. Landscape fragmentation (a concern in this focal area) contributes to higher nest predation and parasitism rates, lower reproductive success, and lower adult and juvenile survival (Doherty and Grubb 2002).

### Research needed:

- Research is needed to determine the effects of feral cats and other predators on reproductive success of this species in agricultural and developing landscapes.
4. **Climate change.** Effects of climate change could include changes in seasonal climate that could shift migration patterns of birds, such as field sparrows, and changes in food availability.

# Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

## Research needed:

- Research is needed to determine the effects of climate change on this species.

## *Partners/potential funding:*

Partners in Flight (PIF), U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), universities.

## *Population goal(s) for New York State:*

No New York-specific population objectives have been articulated in the existing conservation plans. However, the PIF program (Rich et al. 2004), which provides a population estimate for U.S. and Canada for this species of 8,200,000 (with 245,148 in BCR13), has as its objective a 100% increase in this species. Audubon notes that, “Field sparrows may never regain their former abundance, but it might be possible to stabilize their populations by working to ensure the management of suitable habitat for this and other species that depend on succession grassland and shrub habitats.”

## Research needed:

- To determine a population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, PIF, etc.) to determine appropriate goal for the Upper Hudson.

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

#### **1. Loss of habitat and habitat function.**

- a. Use geospatial tools to analyze existing areas of habitat to determine potential breeding areas and analyze breeding bird survey data to focus efforts.
- b. Influence landowner and regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species. This includes: encouraging landowners to enroll in the Conservation Reserve Program (CRP), which pays farmers to keep marginal farmlands idle and supports good bird habitat; working to promote proper management of power line rights-of-way for field sparrows and other species that depend on successional habitats; encouraging managers of parks and natural areas to create and/or leave suitable habitat; and, facilitating habitat preservation through

## Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

coordination with land trusts. Such actions will increase the number of acres supporting birds dependent on such lands and the functions those habitats provide.

- c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to field sparrows (including mowing guidelines), and use these to influence landowners, including farmers and other private owners, utility agencies, and park managers regarding early succession habitat needs of this species.
- d. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit early successional species, including the field sparrow, through creation of new patches of succession habitat. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection.

### 2. Invasive species.

- a. Strategy will depend upon results of research need noted above.

### 3. Nest predation.

- a. Strategy will depend upon results of research need noted above.

### 4. Climate change.

- a. Strategy will depend upon results of research need noted above.

#### *Partners/potential funding:*

PIF, USGS, NRCS, NPS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, universities

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

### A. Loss of habitat and habitat function.

1. Influence landowner and regulatory agency decisions regarding proposed development, agricultural practices, etc. that result in loss of habitat and habitat functions for this species.
  - a. Create maps of potential field sparrow sites of concern.
  - b. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to field sparrows and/or their habitat based on

## Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

identification of priority grassland habitats (Conservation Planning Assistance [(CPA)]).

- c. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to field sparrows and/or their habitat.
- d. Restore 100 acres of early successional habitat to benefit field sparrows and other birds with similar habitat needs (Partners for Fish and Wildlife [PFW]).

### B. Invasive species.

1. Delivery will depend upon strategy determined from research noted above.

### C. Nest predation.

1. Delivery will depend upon strategy determined from research noted above.

### D. Climate change.

1. Delivery will depend upon strategy determined from research noted above.

*Partners/potential funding:*

PIF, USGS, NRCS, NPS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, universities.

## OUTREACH

### Potential outreach needs:

- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan including the PIF Northeast Working Group. A NYFO Outreach representative will join that Working Group.
- Landowner education.
- Public involvement and education to address the perception that forest management is harmful to birds (NYSDEC 2005).

*Partners/potential funding:*

PIF, USGS, NRCS, NPS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, universities

## MONITORING

## Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

Develop protocols to measure success of all conservation delivery activities.

Work with partners to identify leads for accomplishing monitoring activities.

Develop BMP from results of monitoring to inform future field sparrow population restoration activities.

### References

Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish & Wildlife Service, Sunderland, Massachusetts.

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Doherty, Paul F., Jr. and Thomas C. Grubb Jr. 2002. Survivorship of Permanent-Resident Birds in a Fragmented Forested Landscape. *Ecology* 83(3): 844-857.

National Audubon Society. State of the Birds. #9 Common Bird in Decline, Field Sparrow (*Spizella pusilla*). <http://www.audubon.org/bird/stateofthebirds/cbid/profile.php?id=9>. Accessed 3 March 2010.

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

Morgan, Michael and Michael Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under contract #C005137. Audubon New York, Ithaca, New York. 8 May 2008.

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Iñigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panjabi, D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY.

Partners in Flight website [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/) (VERSION: March 2005).

Existing strategies for field sparrow restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007) [http://www.acjv.org/bcr13\\_plan.htm](http://www.acjv.org/bcr13_plan.htm)

## Field Sparrow (*Spizella pusilla*): Upper Hudson Focal Area

- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm)
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)
- A Plan for Conserving Grassland Birds in New York,” Final Report to NYSDEC (Morgan & Burger 2008)  
<http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf>.



# Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

## Indiana Bat Species Action Plan

### FOCAL AREA: UPPER HUDSON RIVER

### BIOLOGICAL PLANNING

#### *Other species benefitting:*

eastern small-footed, little brown, tri-colored, northern, big brown, bog turtle

#### *Introduction to species*

**Species information:** The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h. Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at <http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf>.

Streams associated with floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (e.g., old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (Service 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

**Justification for species selection:** The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

**State contribution to overall species population:** New York used to have ~11% of wintering Ibats rangewide before White-nose syndrome (WNS). NY still has the largest number of wintering (and likely summering) Ibats in the region. There are draft recovery units and New York is part of the northeast recovery unit.

#### **Threats and threat assessment:**

# Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

Threats<sup>26</sup> (See 5-year review for full assessment):

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** *See the Plan for in-depth discussion (Service 2007, page 71).*

- A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) has been identified as a long-standing and ongoing threat to the species.
- B. Winter – potential to impact hibernacula with gas drilling, filling, etc.
- C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development
- D. Fall (swarming) – same pressures as spring/summer habitat

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** *See the Plan for in-depth discussion (USFWS 2007, page 80).*

- A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

**Factor C. Disease or predation:**

- A. WNS is most significant threat in New York. Predation is also a threat.

**Factor D. The inadequacy of existing regulatory mechanisms:** *See the Plan for in-depth discussion (USFWS 2007, page 90).*

- A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

**Factor E. Other natural or manmade factors affecting its continued existence:** *See the Plan for in-depth discussion (USFWS 2007, page 91).*

- A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.
- B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and PCBs), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

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<sup>26</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

## *Recovery Goals*

**Range-wide Recovery Goals/Objectives:** Intermediate- reclassification, Long-term- delisting

## **Conservation goal(s) for New York State:**

The Draft Recovery Plan does not have specific criteria for NY. However, NY has several P1 and P2 hibernacula and there are criteria for protecting 80 % of P1 hibernacula in each Recovery Unit.

## **Research/Actions needed:**

- A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions- not included in recovery plan- WNS will eventually have a separate plan).
- B. WNS-related research is needed to better understand the threat.
  - 1. Assist with RFPs as requested (ESA)
  - 2. Review proposals if requested to be on review team (ESA)
  - 3. Provide grant oversight for FY08 and FY09 projects (FY2011-2012) (ESA)
  - 4. Assist with field work (FY2011). (ESA)
- C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6).
  - 1. Assist with Ibat modeling SDM effort until completion (NYFO ESA)
  - 2. Respond to data requests from USGS and R3 (FY11)
  - 3. Participate in calls during Beta testing (FY11)
  - 4. Attend workshop to test model (FY11)
  - 5. Assist with role out of model (FY11)
  - 6. Provide TA to FOs with use of model (FY11,12)
- D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4).
  - 1. Send all samples out for analysis (FY11, EC)

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

## Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

- Draft Recovery Plan 2007 (Service 2007)
- Last 5-year review completed 2009 (Service 2009)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Assist R3 with finalizing Recovery Plan as requested (FY11, NYFO ESA)
- B. Reduce current threats at known hibernacula (primarily WNS-related actions- not included in recovery plan- WNS will eventually have a separate plan) (Recovery Action 1.1.1)
  1. WNS National Plan
    - a. Provide technical assistance during FWS and/or public review periods (FY2011) (ESA)
    - b. Participate in Communications Group (FY2011,12,13, NYFO ESA)
  2. WNS-related research is needed to develop conservation strategies to respond to WNS.
    - a. Assist with captive bat management structured decision making process (FY10, 11, NYFO ESA)
- C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.
  1. Participate in multi-region project to develop guidance (FY10,11, NYFO ESA)
  2. Coordinate first R3, R4, R5 t/e wind call- 2/3 (FY10)[completed]
  3. Participate in multi-region calls (FY10 and beyond) (ESA)
- D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)
  1. Assist R3 with this effort
- E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)
- F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)
  1. Assist with funding automation of acoustic survey data analysis

## Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

- a. Participate in Regional WNS funding discussions and promote funding by FY10 Congressional pot (FY10,11)
  - b. Assist with grant agreement (FY10)[completed]
2. Determine whether netting guidelines should be revised to include acoustic detectors
    - a. Participate in Ibat/Wind Initiative protocol workgroup (FY10)[completed]
    - b. Participate in protocol team as requested (FY11)
- G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)
1. Fund or otherwise coordinate wind project research
    - a. Flight altitude?
    - b. Migratory pathways?
    - c. Impacts of wind turbines on resident v. migrating bats?
    - d. Minimization/mitigation measures?
    - e. Post-construction monitoring techniques?
- H. Regional coordination role
1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads (FY11) (ESA) Potential outcomes:
    - a. Provide updates to FOs on literature, information from other regions
    - b. Provide technical assistance to FOs on formal consultations/HCPs
    - c. Provide R5 comments on national issues (e.g., survey protocol updates)
    - d. Provide R5 end-of-year reporting info to R3
    - e. Maintain understanding of current literature
    - f. Participate in WNS-related projects as needed

### CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)
- B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)

## Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

- C. Encourage habitat protection through acquisition/easements
  - 1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants
  - 2. Provide technical assistance to NRCS for potential easements
- D. Minimize adverse impacts to Ibat during project reviews (Recovery Action 2.6)
  - 1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor
    - a. Review annual reports from
      - i. Adams Fairacre Farms (FY11,12, NYFO ESA)
  - 2. Habitat protection through informal and formal consultations and HCPs.
    - a. Assist with development of measures for NiSource HCP (ESA)
    - b. Develop conservation framework, including standard conservation measures, for residential and commercial projects (ESA)

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

### **Factor C. Disease or predation:**

- A. Need to determine what conservation measures will be available for WNS-response.

### **Factor D. The inadequacy of existing regulatory mechanisms:** Review NYSDEC permit conditions (FY11) (ESA)

### **Factor E. Other natural or manmade factors affecting its continued existence:**

## **OUTREACH**

- A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat, including development of guidelines, best management practices, land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)
- B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)
  - 1. Current Indiana bat/WNS display

## Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area

- a. Continue to rotate display at nature center (any NYFO program)
  - b. Update display at least once/year (ESA)
2. New Indiana bat display
    - a. Provide technical assistance to the USFS in the development of a new display (ESA)
    - b. Receive transfer funding from USFS and develop contracts to complete display (FY2011, Cost:\$10-15,000 [\$5,000 from USFS, rest from WNS and NYFO]) (ESA)
  3. New Indiana bat cave display
    - a. Develop new cave display (FY2012, Cost: \$1000)
  4. Attend meetings/workshops
- C. Use Service websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)
1. Update fact sheets and web materials (NYFO and R5) (FY10,11)
  2. Assist with FOIA responses as needed

### MONITORING

- A. Survey winter populations of I bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)
- B. Assist NYSDEC with 2010 hibernacula surveys (FY10)[completed]
  1. Graphite
  2. Barton Hill
  3. Williams Complex
- C. Assist NYSDEC with “Ibat on year” winter 2010-2011 surveys (FY11) (Who: NYFO, staff costs) (ESA)
- D. Review and track recovery progress.

### *Partners*

NYSDEC, R3, R4, R5 FOs, NYSDOT, FHWA, USGS, Hudsonia, TNC

### *References*

## **Indiana Bat (*Myotis sodalis*): Upper Hudson Focal Area**

U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 600 pp. (This document has been peer-reviewed and is available at <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.



# Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

## Karner Blue Butterfly Species Action Plan

### FOCAL AREA: UPPER HUDSON

#### *Other species benefitting:*

frosted elfin, Persius duskywing, spadefoot toad, hognose snake, other pine barrens species

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Potential habitat of the Karner blue butterfly (Kbb) is distinguished by the presence of dry, sandy, nutrient poor soils, with open woods and clearings supporting the plant wild lupine (*Lupinus perennis*), which is the only known food plant for the larvae; however, a variety of other plants provide nectar sources used by the butterflies. This type of habitat is usually associated with pitch pine/scrub oak or oak savannah communities that are maintained by fire at an early stage of plant succession. Some life history stage of the Karner blue butterfly (eggs, larvae, pupae, or adults) is present all year in the wild blue lupine habitat where it occurs

**Justification for species selection:** The Kbb is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) is the regional lead field office.

**State contribution to overall species population:** The Kbb only occurs in 2 states in R5 (New York and New Hampshire). Four counties in northeastern New York currently contain Kbbs. New York has one Recovery Unit (RU) (Glacial Lake Albany) which is necessary for the overall recovery of the species. There are two potential recovery units with potential for future restoration in the Rome Sandplains and Iroquois/Tonawanda area as well.

#### **Threats and threat assessment:**

Threats<sup>27</sup> (See 2003 recovery plan for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Loss and/or fragmentation of habitat due to: vegetational succession due to lack of management (significant threat), commercial, industrial, and residential development

#### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** NA

#### **Factor C. Disease or predation:**

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<sup>27</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

# Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

- A. Heavy lupine browse by mammals
- B. Thrips (*Odonatothrips loti*) may be a problem at some New York sites where they have been found on lupine plants

## Factor D. The inadequacy of existing regulatory mechanisms:

- A. Without the Endangered Species Act (ESA), there is inadequate protection in some states.

## Factor E. Other natural or manmade factors affecting its continued existence:

- A. Nuisance plants
- B. Stochastic events such as droughts and cool springs
- C. Climate change - Kbb's have narrow climatic constraints and a dependency on snow cover
- D. Pesticide use
- E. Potential hybridization between the melissa blue (*Lycaeides melissa melissa*) found in western Wisconsin (near Hudson)

## *Recovery Goals*

### *Range-wide Recovery Objectives:*

Interim - Restore viable metapopulations of Kbb's across the species extant range so that it can be reclassified from endangered to threatened.

Long-term - Delist

**Conservation goal(s) for New York State:** Establish 3 viable populations of Kbb's in the Glacial Lake Albany RU.

**Research/Actions needed:** NA

## CONSERVATION DESIGN

### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Recovery Plan completed 2003 (Service 2003)
- Spotlight Species Action Plan completed 2009 (Service 2009)
- 5-year review initiated
  - [Assist R3 with review/comments \(FY2010/2011, NYFO ES\)](#)

# Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Develop protection and management plans for New York (Recovery Action 1.312) AND
- B. Develop implementation strategies to promote recovery (Recovery Action 1.5)
  - 1. Assist agencies with development of localized plans
    - a. Attend Saratoga New York State Department of Environmental Conservation (NYSDEC) Area Management Plan meeting in Wilton- 2/10/2010 (FY2010)-completed
    - b. Attend Albany Pine Bush Preserve Commission (APBPC) Management Plan meeting (FY2010) - completed
    - c. Assist with other localized plans as requested
- C. NYSDEC developing a recovery plan
  - 1. Participate in process of developing a State recovery plan as needed/requested (FY2011, NYFO ES)

## CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Continue/start management activities for New York (Recovery Action 1.23)
  - 1. Multi-year Spencer Christmas Tree Farm office project
    - a. Assist with additional clearing- Dec 2009 (FY2010)[completed]
    - b. Assist with additional clearing- FY2011 (NYFO- All programs 1-2 days staff time) (Endangered Species [ES] to coordinate)
  - 2. Assist with other projects
    - a. Provide grass seed to New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) for Saratoga Spa State Park- Dec. 2009 (FY2010) [completed]
    - b. Provide technical assistance to partners for grant development (FY 2011-2013, NYFO ES)

# Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

- c. Provide funding when possible
  - i. Submit habitat management recovery projects to Regional Office (RO) for funding (FY2010) [completed- funded with end-of-year]
    - NYSDEC project - Complete grant agreement paperwork (FY2011, NYFO ES)
    - Provide grant oversight (FY2011, NYFO ES)
  - d. Collect lupine/nectar seed (1-2 days) at one site (FY2011, NYFO any program) (ES to coordinate)
  - e. Consider need for additional habitat restoration in Rome Sandplains (Great Lakes) and possible future translocation/reintroduction (FY2012, 2013)
- 3. Law enforcement cases/settlements
  - a. Conduct site visits and document completed projects for two law enforcement cases/settlements (FY2011, NYFO ES)
- B. Implement long term land protection strategies in New York (Recovery Action 1.3222)
  - 1. Meet with partners to determine how many acres of protected lands are needed in each viable population area
  - 2. Provide technical assistance to partners to acquire funding for protection
    - a. Non-traditional S6 grants to NYSDEC
  - 3. Continue efforts to protect and restore habitat in the 4 New York target areas- assist with funding or implementation
  - 4. Increase efforts in the Queensbury area (very small fragmented sites left - but National Grid Habitat Conservation Plan [HCP] will help)
- C. Section 7 Consultations (Recovery Action 1.411)
  - 1. Saratoga County Airport consultations have involved restoration of ~60 acres and more can be done
    - a. Monitor Biological Opinion (BO) implementation (FY2011, NYFO ES)
  - 2. Albany Landfill consultation will involve habitat restoration

## Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

- a. Finish BO (FY2010, NYFO ES) (Completed)
  - b. Monitor BO implementation (FY2011, NYFO ES)
  - c. Monitor BO implementation (FY2012-13, NYFO ES)
3. Beaver Pond residential development
- a. Complete consultation (FY2011) (ES)
- D. 10(a)(1)(A) permit review (Recovery Action 1.412)
1. Meet with NYSDEC on annual basis to review work conducted under their permit (FY2011-2013, NYFO ES)
- E. 10(a)(1)(B) permit review (Recovery Action 1.413)
1. National Grid HCP-
    - a. Release for public comment (FY2011, NYFO ES)
    - b. Complete permit decision (FY2011, NYFO ES)
    - c. If permit is given, monitor permit annually (FY2012-13, NYFO ES)
  2. Town of Wilton HCP- get out for public comment and complete permit decision in FY10 *revision- completed as 10(a)(1)(A) recovery permit action with NYSDEC. No HCP for Town needed*
- F. Identify mechanisms to streamline the Federal permit process for private landowners (Recovery Action 1.43)
- G. Initiate/continue reintroductions and accelerated colonization in New York (Recovery Action 2.213)
1. Increase Kbb populations at restored sites with translocation and augmentation (NYSDEC lead)
    - a. Complete grant agreement paperwork to fund captive rearing, augmentation efforts (FY2010)(completed)
    - b. Complete grant agreement with APBPC for 2011 captive rearing, augmentation efforts (FY2011, NYFO ES)
    - c. Manage two grant agreements with APBPC
      - i. Visit translocation sites (FY2010-12, NYFO ES)

# Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

## ii. Review reports and invoices (FY2010-12, NYFO ES)

### H. Encourage private landowners to conserve the Kbb (Recovery Action 4.3)

1. Complete Safe Harbor Agreement (The Nature Conservancy [TNC]) (FY2010) (completed)
  - a. Meeting with NYSDEC, TNC, APBPC- 2/10/2010
  - b. Complete U.S. Fish and Wildlife Service (USFWS) documents
  - c. Revise Safe Harbor Agreement (SHA) and appendices
  - d. Assist with permit conditions
2. Work with APBPC/TNC to showcase SHA and make a push for landowner sign-ups (FY2011, NYFO ES)
3. Monitor SHA permit annually after sign ups

**Factor C. Disease or predation:** No work in New York planned.

**Factor E. Other natural or manmade factors affecting its continued existence:** No work in New York planned.

## OUTREACH

### Recovery Action 4

1. Annual Lupine Festival at APBPC
  - a. Attend with a display
2. Lupine t-shirts - could design an updated version
3. Many opportunities to better spread the word about USFWS involvement
  - a. Attend (1) work day with TNC or APBPC (FY2011, NYFO ES)
  - b. Assist NYSDEC with surveys at Saratoga County Airport or other high visibility locations
  - c. Attend events at Saratoga Spa State Park
  - d. Develop brochure for the Partners for Fish and Wildlife (PFW) program, specifically for Kbb habitat restoration
  - e. Visit Farnsworth Middle School, Queensbury or Shenandoah High School

## Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

- f. Attend public meetings in Wilton, Queensbury, Milton, etc.
- g. Work with Crossgates to update outreach materials at the mall
- h. Publicize restoration activities in local papers
- i. [Update our website with recent projects like Spencer \(annually FY2011-13\) \(PFW, IT, and ES\)](#)

### MONITORING

1. Development of protocols to measure progress/success
2. Monitoring to measure progress/success
3. Monitor population trends, habitat, and distribution in New York (Recovery Action 1.14)
  - a. NYSDEC, TNC, and APBPC monitor almost all sites on an annual basis (FY2011-13, Federal Aid grants to NYSDEC); review results (ES)
  - b. Explore additional funding opportunities for monitoring
4. Monitor habitat management relative to the Kbb (Recovery Action 5.11)
  - a. Assess habitat suitability at restoration sites
  - b. Monitor response of Kbb to restoration projects
5. Monitor Kbb translocation methods (Recovery Action 5.13)
  - a. Methods have been developed for New Hampshire, Ohio, Indiana, and New York, and tweaking is always underway
6. Monitor Glacial Lake Albany RU metapopulation decline (Recovery Action 5.16)
  - a. Determine causes of decline and how to mitigate
7. Conduct Recovery Team meetings (Recovery Action 6.2)
  - a. [Participate in twice yearly Kbb team calls \(NYFO ES\)](#)

### *Partners*

TNC, APBPC, NYSDEC, New York State Natural Heritage Program (NYSNHP), NYSOPRHP, New York State Department of Transportation (NYSDOT)

### *References*

U.S. Fish and Wildlife Service. 2003. Final Recovery Plan for the Karner Blue Butterfly

## **Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area**

(*Lycaeides melissa samuelis*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota.  
273 pp.

U.S. Fish and Wildlife Service. 2009. Karner Blue Butterfly Spotlight Species Action Plan.



# **New England Cottontail (*Sylvilagus transitionalis*): Upper Hudson Focal Area**

## **New England Cottontail Species Action Plan**

### **FOCAL AREA: UPPER HUDSON**

#### *Other species benefitting:*

American woodcock, golden-winged warbler, blue-winged warbler, brown thrasher, common nighthawk, ruffed grouse, whip-poor-will

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** The New England cottontail (NEC) is New England's only native cottontail rabbit. The NEC populations historically occurred throughout the New England states and eastern New York and have declined dramatically in recent decades due to habitat loss and fragmentation resulting from land use change; habitat loss continues within its currently limited range. The NEC is a Species of Greatest Conservation Need (SGCN) in all seven states in its range, and a Candidate Species for Federal listing under the Endangered Species Act (ESA). The NEC requires thicket habitat and is frequently associated with shrublands and early successional forests. Studies show that the NEC's mortality rate is twice as high on patches smaller than 6 acres than it is on patches over 12 acres. On small patches, the habitat may provide insufficient food to support the cottontails throughout the winter. In these conditions, NECs either starve or risk predation in search of food outside the safety of dense cover. Habitat blocks of at least 25 acres in size (ideally much larger) and close to additional patches of habitat are necessary for the species to survive. (Arbuthnot 2008).

**Justification for species selection:** The NEC is a Federal candidate (since 2006) for listing and is a New York State Species of Concern. It is also a U.S. Fish and Wildlife Service (USFWS) Spotlight Species. There is a 2007 Memorandum of Understanding among the Natural Resources Conservation Service (NRCS), USFWS, and Association of Fish and Wildlife Agencies to strengthen cooperation to conserve at-risk species and prevent their need for future listing under the ESA. Among the highest priorities in the New York Comprehensive Wildlife Conservation Strategy in 2009 is a Private Landowner Management Program for shrubland species, including NEC. There is a National Fish and Wildlife Foundation Keystone Initiative for the NEC. The NRCS has secured "special project" funding for NEC conservation activities.

**State contribution to overall species population:** Currently unclear. Working with New England Field Office (NEFO) and State partners to determine how many populations/acres we should target in New York.

#### **Threats and threat assessment:**

# **New England Cottontail (*Sylvilagus transitionalis*): Upper Hudson Focal Area**

Threats<sup>28</sup>:

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Habitat succession
- B. Residential and commercial development

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

- A. Limited hunting

**Factor C. Disease or predation:**

- A. Numerous diseases affect cottontail rabbits, but no information to suggest this is a significant threat.
- B. Predation is a significant threat, particularly because current patches are insufficient to provide adequate cover and food. Common predators include coyotes, red foxes, bobcats, fishers, domestic cats, and owls.

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Ongoing threat.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Invasive species.
- B. Eastern cottontail competition.
- C. White-tailed deer competition.
- D. Weather.
- E. Road-kill.

## ***Conservation Goals***

***Range-wide Conservation Goals/Objectives:*** The 2009 Spotlight Species Action Plan goal is to reduce listing priority number from 2 to 8 by 2012. The ultimate goal of the USFWS is to preclude the need to list the NEC.

Population and/or habitat goals are not developed yet.

***Conservation goal(s) for New York State:*** Long-term goals are not developed yet. 2011 NRCS goal for New York is 40 acres entered into the Wildlife Habitat Incentive Program (WHIP).

**Research/Actions needed:**

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<sup>28</sup> Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

## New England Cottontail (*Sylvilagus transitionalis*): Upper Hudson Focal Area

- Develop range-wide Conservation Strategy.
- Participate in Steering Committee.
- Assist NEFO with development of Strategy upon request.
- Develop New York conservation goals using predictive modeling from the State Wildlife Grant Program (SWG) projects as starting point (ES)
- Conduct additional surveys to better understand current range of NEC in New York.
- Assist New York State Department of Environmental Conservation (NYSDEC) with pellet collection (FY 2011, New York Field Office (NYFO) Endangered Species [ES]).
- Assist NYSDEC with pellet analysis.

### CONSERVATION DESIGN

#### *Strategies for addressing those threats*

Please go to these documents for the existing strategies:

- Spotlight Species Action Plan completed in 2009 (Service 2009)
- Landowners Guide to Habitat Management (Arbuthnot 2008)

**Research or Actions needed:** Specific actions for the next 3 years addressing conservation design include the following:

- A. Participate in multi-state SWG project and NEC USFWS Initiative.
  1. Range-wide efforts (all items are ES)
    - a. Participate in monthly calls (FY2010, FY2011, FY2012)
    - b. Participate in steering committee calls/meetings
    - c. Assist with development of range-wide conservation strategy
    - d. Review products from SWG grant
  2. New York efforts
    - a. Attend New York kick-off meeting October 2009 (completed)
    - b. Assist with development/review of focus area maps (FY2010, FY2011) (ES)

## **New England Cottontail (*Sylvilagus transitionalis*): Upper Hudson Focal Area**

- c. Hold joint New York bog turtle/NEC initiative meeting June 2010 (completed)
  - d. Develop goals for New York populations (see biological planning above) (ES)
- B. Participate in NRCS NEC Restoration Initiative (FY2011 and potentially beyond)
- 1. Participate in initial conference calls (FY2011, NYFO ES, Partners for Fish and Wildlife [PFW])
  - 2. Assist NRCS with ranking criteria for FY2011 WHIP (NYFO ES, PFW)
  - 3. Assist NRCS with signing up landowners for FY2011 WHIP (PFW)
  - 4. Provide technical assistance to NRCS for development of outreach products as needed (example – Maine Field Office brochure) (ES, PFW)
  - 5. Attend NRCS public/landowner information sessions if applicable (PFW)
  - 6. Convene meeting (Millbrook) with partner agencies to: (1) sign them up for WHIP, if possible; and, (2) develop landowner outreach strategy to sign additional landowners into the program to meet NRCS FY2011 goals (40 acres) (NYFO ES, PFW, NEFO, Coastal) (PFW to deliver identified projects, funding dependent)
    - a. Pre-meeting logistics
      - i. Develop meeting goals, objectives, agenda
      - ii. Develop invite list and send out invitations
    - b. Hold meeting
    - c. Post meeting
      - i. Send notes and action items
      - ii. Additional follow-up TBD

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Work with New York NEC Team to protect/manage habitat

## **New England Cottontail (*Sylvilagus transitionalis*): Upper Hudson Focal Area**

1. Determine whether there is overlap with current NRCS easements for bog turtle (June 2010 meeting) (completed).
2. Conduct restoration activities in Wetlands Reserve Program (WRP) wetland buffers, as needed, using our equipment for the creation of brush pile, hydro-axe, and plantings.

B. [Participate in NRCS NEC Initiative \(FY2011 and potentially beyond\) as noted above. \(ES, PFW\)](#)

C. If State is interested, consider a Candidate Conservation Agreement with Assurances (CCAA) for New York based on New Hampshire's and Maine's

D. Develop programmatic conference opinion for NEC habitat restoration (FY2012, NEFO, NYFO)

E. Develop National Fish and Wildlife Foundation (NFWF) Business Plan for New York

### **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**

No work planned in next 2-3 years.

**Factor C. Disease or predation:** No work planned in next 2-3 years.

**Factor D. The inadequacy of existing regulatory mechanisms:** No work planned in next 2-3 years.

**Factor E. Other natural or manmade factors affecting its continued existence:** Expansion of habitat for NEC will help alleviate pressures from eastern cottontail and address invasive species (see actions under Factor A).

## **OUTREACH**

- Develop outreach strategy to sign up landowners into NRCS or USFWS programs
  - [Co-host landowner outreach meeting with NRCS \(2011\) \(ES\)](#)
- Develop overall outreach strategy to increase awareness of the species in New York
  - Provide general information to non-profit organizations, hunters, nature centers (2012)
  - [Update website with NEC information and ongoing projects \(2011\) \(ES and IT\)](#)
  - “Brake for bunnies” bumper stickers (2012)

## **MONITORING**

Review and track recovery progress. TBD success monitoring will be sought.

## **New England Cottontail (*Sylvilagus transitionalis*): Upper Hudson Focal Area**

### *Partners*

NYSDEC, New York State Natural Heritage Program (NYSNHP), The Nature Conservancy (TNC), NRCS, Columbia County Land Trust, NFWF

### *References*

Arbuthnot, M. 2008. A Landowner's Guide to New England Cottontail Habitat Management. Environmental Defense Fund. 37 pp.

U.S. Fish and Wildlife Service. 2008. Candidate Notice of Review.

U.S. Fish and Wildlife Service. 2009. New England Cottontail Spotlight Species Action Plan. U.S. Fish and Wildlife Service, Concord, New Hampshire, and Hadley, Massachusetts.

## UPPER SUSQUEHANNA FOCAL AREA

The Upper Susquehanna Focal Area (USFA) is located in the eastern portion of the Southern Tier of New York and contains approximately 6,260 square miles or 11.5% of the state. This focal area is largely demarcated by the watersheds of the Susquehanna and Chemung Rivers. It is located almost entirely within the Glaciated Allegheny Plateau with a local relief of 190-1000 feet. Overall elevation ranges from 900-2200 feet. The USFA is characterized by its extensive plateau with glacially-rounded hills and glacially-widened U-shaped valleys.

The Susquehanna River Basin is the second largest east of the Mississippi. Nearly 4,000,000 people live within the basin, and it provides half of the freshwater input for the entire Chesapeake Bay. All of, or portions of, nineteen New York counties are included within the USFA boundary including Steuben, Chemung, Tioga, Broome, Cortland, Chenango, and Otsego, with small areas in Allegany, Livingston, Ontario, Yates, Schuyler, Tompkins, Cayuga, Onondaga, Madison, Oneida, Herkimer, and Delaware counties. Approximately 450,000 people live within this focal area, concentrated primarily in the cities of Binghamton, Elmira, Oneonta, and Cortland with much of the remainder of the population in the Chemung and Susquehanna River valleys. The landscape character across the region has transitioned in the last century from predominately agricultural to predominately forested with a patchwork of agricultural lands interspersed with urban areas and rural towns.

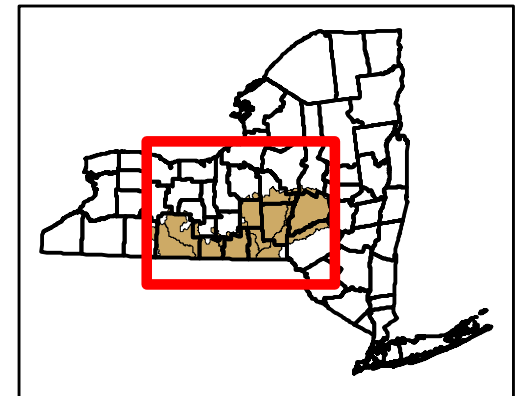
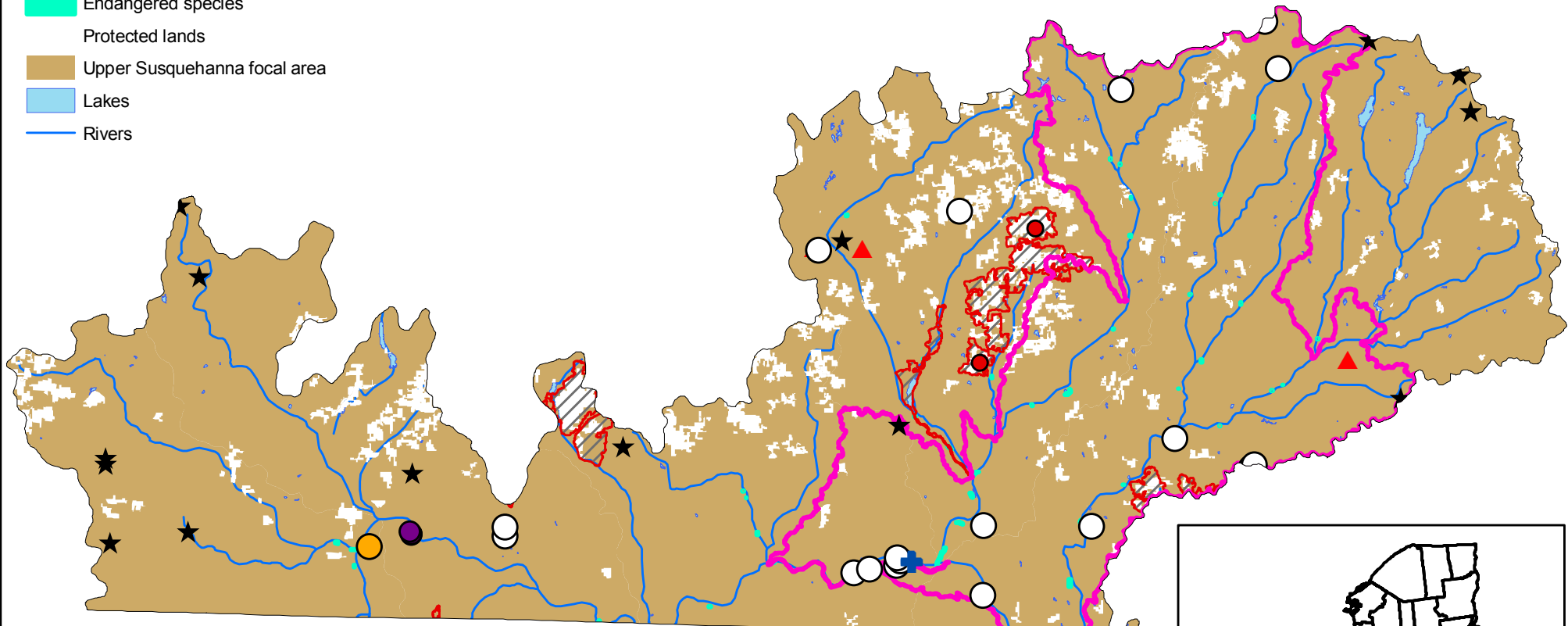
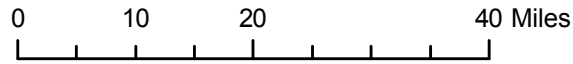
This focal area was selected because it contains important riverine and forested wetland environments that support a unique set of regionally significant fish, wildlife, and plant resources. There are currently one Federally-listed species (endangered [E]) and five identified species of concern within the focal area. The large rivers and high quality tributaries within the focal area support remnant populations of brook trout and eastern hellbender as well as the potential to support renewed spawning grounds for American shad. Vernal pool habitats are present throughout the focal area and they support a variety of wetland species including the Jefferson salamander and northeastern bulrush (E). The matrix of successional habitat present throughout the focal area is also important habitat for woodcock. The USFA is located within Bird Conservation Region 28 (Appalachian Mountains) and Partners in Flight Physiographic Area 24 (Allegheny Plateau).

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with Marcellus shale drilling, industry, transportation, wind power, dam removal, and development. Specific threats include habitat loss (principally), fish barriers, flooding, streambank erosion, gravel deposition, nutrient loading, and climate change. Current projects include Federal and non-federal permit review for hydroelectric, shale gas, and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

# Legend

- ⊕ Mussel survey 2009
- Lampmussels
- Northeastern bulrush
- Hellbender habitat
- Bird conservation areas
- ▲ Hawkwatch sites
- ▨ Important bird areas
- ★ Wind turbines
- NPL Sites
- Endangered species
- Protected lands
- Upper Susquehanna focal area
- Lakes
- Rivers

## Upper Susquehanna Focal Area





# **American Shad (*Alosa sapidissima*): Upper Susquehanna Focal Area**

## **American Shad Species Action Plan**

### **FOCAL AREA: UPPER SUSQUEHANNA**

#### *Other species benefitting:*

Other anadromous and catadromous species such as American eel; eastern hellbender

### **BIOLOGICAL PLANNING**

#### *Introduction to species*

**Species information:** Research on the biology, habitat requirements, and stock status of American shad is in progress. Coordination with the Susquehanna River Basin Commission (SRBC) and the Pennsylvania Field Office will occur. The goal for this species is restoration to sustainable levels. Historically, the Susquehanna River supported spawning runs of shad, with fish migrating as far upstream as Cooperstown, NY. Spawning is April-June.

**Justification for species selection:** Regional New York State Department of Environmental Conservation (NYSDEC) fisheries staff assisted with the stocking of American shad fry in the Susquehanna River. On June 2, 2004, nearly 485,000 fry were picked up at the Pennsylvania Fish and Boat Commission's VanDyke Fish Hatchery and stocked in the river at Apalachin and Binghamton. This was the third year of a five year experimental American shad stocking program in the New York portion of the Susquehanna River drainage. These fish were stocked as part of a multi-state cooperative effort to restore a self-sustaining population of shad in the Susquehanna River. The Susquehanna River Anadromous Fish Restoration Cooperative (SRAFRC) includes natural resource agencies from Pennsylvania and Maryland as well as the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Susquehanna River Basin Commission. The New York Field Office (NYFO) selected shad as a focal species to assist with this effort and to preclude listing of the species, and because it is important to the Chesapeake Bay Initiative.

**State contribution to overall species population:** At this time, due to the dam at Sunbury, PA, there are no runs of American shad into New York.

#### **Research needed:**

- Population goals for American shad based on modeling and field investigations  
(Who: NYSDEC, Trout Unlimited [TU], NYFO, SRBC; Cost: Unknown at this time)
- Assist with shad surveys to determine presence/absence and population densities, coupled with habitat investigations.

(Who: NYSDEC, TU, NYFO, SRBC; Cost: Unknown at this time)

# **American Shad (*Alosa sapidissima*): Upper Susquehanna Focal Area**

## **Threats and threat assessment:**

### **1. Barriers to migration (dams and culverts).**

#### **Research Needed:**

- Determine the genetic diversity of shad in the watershed. (This becomes important when barriers are removed and to establish management units that are dependent on the level of genetic variation).

(Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

- Identify priority subwatersheds to establish shad once they make it into the upper watershed.

(Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

- Suitable habitat investigation and mapping (substrate, water temp./quality, instream cover, riparian cover, etc.).

(Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

- Monitor shad runs as habitat opens up for them to establish baseline.

(Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

### **2. Increased sediment load (from non-point source runoff, including agricultural practices).**

### **3. Competition from introduced species.**

### **4. Overfishing (in coastal areas and larger rivers in the lower basin).**

### **5. Climate Change (warmer conditions will increase water temperatures, reduce winter snow and ice cover, and alter the timing, duration, and volume of seasonal stream flow).**

### **6. Emerging contaminants (in Susquehanna watershed, downstream of moderate sized communities of Corning, Elmira, Triple Cities).**

*Partners/potential funding:*

NYSDEC, TU, SRBC

*Population goal(s) for New York State:*

## **American Shad (*Alosa sapidissima*): Upper Susquehanna Focal Area**

The population goal is to achieve self-sustaining runs of shad in the Susquehanna basin and to maintain or increase the level of shad fry stocking in New York portions of the basin, and to advocate for improvements in fish passage facilities at Chemung and Susquehanna dams, including Rock Bottom Dam in Binghamton. As described above, research is needed to determine what a self-sustaining population would be.

### **CONSERVATION DESIGN**

#### *Strategies for addressing those threats*

##### **1. Barriers to migration.**

- a. Promoting, where possible, dam and culvert removal and/or re-design or modification.
  - i. Work with Lower Great Lakes Fish and Wildlife Conservation Office (LGLFWCO), Upper Susquehanna Coalition (USC), and NYSDEC to identify stream barriers for removal or restoration to increase fish passage (Partners for Fish and Wildlife [PFW]) (staff time only)

##### **2. Increased sediment load.**

- a. Assist regulatory agencies and the public in providing recommendations for reducing sediment non-point source pollution through best management strategies in priority watersheds: Butternut, Unadilla, Genegantslet, Owego Creek, Tioughnioga (Conservation Planning Assistance [CPA]) (staff time only).
- b. Participate in State technical committee, subcommittee work to provide technical assistance on programs and projects which minimize sediment loads in streams, and which may provide for establishment of buffers (PFW) (staff time only).
- c. Provide stream protection guidelines via CPA permit and project review, including best management practices (BMP) for NYFO website.
- d. Protect shoreline and buffers by stream bank fencing (typically by planting shrubs/bare root trees).
- e. Restore wetlands in landscape position to benefit streams by capturing sediment, nutrients.
- f. Natural channel restoration.
- g. Provide technical assistance on stream restoration projects in the Upper Susquehanna watershed (PFW) (staff time only).

##### **3. Competition from introduced species.**

## **American Shad (*Alosa sapidissima*): Upper Susquehanna Focal Area**

- a. Reduce invasive species by developing and implementing best management practices.

### **4. Overfishing.**

- a. Support NYSDEC, National Oceanic and Atmospheric Administration (NOAA), and Atlantic States Marine Fisheries Commission (ASMFC) regulations.

### **5. Climate Change.**

- a. Target restoration to areas that will support shad under future climate conditions.

### **6. Emerging contaminants.**

- a. Conduct fish sampling, within the Susquehanna watershed, to evaluate emergent contaminants (FY2011 OR 2012) (staff time plus unknown dollars). (EC)

*Partner organizations:*

NYSDEC, TU, SRBC, USC, NOAA

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

### **1. Barriers to migration.**

- a. Remove barriers to shad migration in priority waters.
  - i. Work with partner organizations to prioritize barriers to be targeted for removal (PFW) (staff time only)
  - ii. Work with LGLFWCO, Susquehanna Fisheries Coordinator, USC, and NYSDEC to fund removal of stream barriers to increase fish passage (PFW) (staff time plus unknown dollars)

### **1. Increased sediment load.**

- a. Reduce sediment non-point source pollution by developing best management strategies.
- b. Provide stream protection guidelines via CPA permit and project review (staff time only). (CPA)
  - i. Distribute BMP information on our website (CPA & IT) (staff time only)

## American Shad (*Alosa sapidissima*): Upper Susquehanna Focal Area

- c. Protect shoreline and buffers.
    - i. Develop buffer and shoreline protection guidelines and distribute them via our website
  - d. Provide technical assistance on stream restoration projects in the Upper Susquehanna watershed (PFW) (staff time only).
    - i. Continue natural restoration of the Canasawacta (target is ¼ mile) (PFW) (staff time plus unknown dollars)
- 2. Competition from introduced species.**
- a. No work identified at this time.
- 3. Overfishing.**
- a. No work identified at this time.
- 4. Climate Change.**
- a. No work identified at this time.

### OUTREACH

Nothing identified at this time.

### MONITORING

- Work with NYSDEC, USC, and LGLFWCO to monitor shad habitat after restoration is complete. This includes electroshocking restored site to determine if shad are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.
- Monitor use of fish passage.

### *References*

Chesapeake Bay Alosid Management Plan, 1989.  
(<http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=60000XSC.txt>)

Susquehanna River Basin Commission. 2008. Comprehensive plan for the water resources of the Susquehanna River Basin. (<http://www.srbc.net/planning/compplanfiles.asp>)

## **American Shad (*Alosa sapidissima*): Upper Susquehanna Focal Area**

Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. (<http://www.asmfc.org/shadRiverHerring.htm>)

# American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area

## American Woodcock Species Action Plan

### FOCAL AREA: UPPER SUSQUEHANNA

#### *Other species benefitting:*

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

**Justification for species selection:** Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked “High” (H) on the BCR 13 list of “Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture”. It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a “Bird in Trouble” in the Eastern Forest in the North American Bird Conservation Initiative’s 2009 report, “The State of the Birds, United States of America.”

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

# American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area

**State contribution to overall species population:** Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can be found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

## Threats and threat assessment:

- 1. Loss of habitat and habitat function.** The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).
- 2. Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

## Research needed:

- Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).
- 3. Contaminants.** Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009).
  - 4. Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.



# **American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area**

## **Research needed:**

- Research is needed to determine the effects of climate change on this species.

## ***Population goal(s) for New York State:***

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

## **Management Objectives for the Population:**

- Halt population declines by 2012 as measured by Singing Ground Surveys
- Have positive population growth by 2022

Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

## **Overall Goal:**

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

## **Management Objectives for Habitat for This Species:**

- Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)
- To increase early successional habitat by 2022

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

## **American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area**

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

### **1. Loss of habitat and habitat function.**

- a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.
- b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.
  - i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.
  - ii. Work with land trusts to target woodcock conservation.
  - iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).
  - iv. Use geospatial tools to:
    - Analyze existing areas of habitat to determine potential breeding areas;
    - Analyze breeding bird survey data to focus efforts; and,
    - Create map for possible woodcock sites of concern.

### **2. Decline in food supply.**

- a. Strategy will depend upon results of research need noted above.

### **3. Contamination.**

- a. Strategy will depend upon results of research need noted above.

### **4. Climate change.**

- a. Strategy will depend upon results of research need noted above.

*Partners/potential funding:*

# **American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area**

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), National Park Service, NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), Upper Susquehanna Coalition (USC), Upper Susquehanna Conservation Alliance (USCA), and universities.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

### **1. Loss of habitat and habitat function.**

- a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.
- b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.
- c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this species. In developing BMPs, consider the management recommendation of the NAS 2009 (appended to the end of this document).
- d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat (FY 2011).
- e. Provide technical assistance to NRCS for Wetland Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock.
- f. Work with partners (USC, RGS, NYSDEC, National Wildlife Refuges [NWR], etc.) to enhance/create early successional habitat within the Focal Area.
  - i. Complete 100 acres of early successional habitat projects (PFW) within the Great Lakes and Upper Susquehanna Focal Areas. Cost would depend on type of equipment used and who would complete work. A rough estimate would be \$300-\$500/ac. (FY 2011-2013).
  - ii. Coordinate logistics with NWR R5 Hydro-Ax (on-going) (PFW).

### **2. Decline in food supply.**

- a. Delivery will depend upon strategy determined from research noted above.

### **3. Contamination.**

## **American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area**

- a. Delivery will depend upon strategy determined from research noted above.

### **4. Climate change.**

- a. Delivery will depend upon strategy determined from research noted above.

#### *Partners/potential funding:*

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and WMI. Other potential partners include: USGS, NRCS, National Park Service, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, New York Power Authority, universities.

## **OUTREACH**

### [Landowner education during site visits when potential habitat projects are present \(on-going\) \(PFW\).](#)

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

### [Put Landowners Guide to Woodcock Management up on NYFO web site \(FY 2011\) \(IT\).](#)

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds."

#### *Potential Outreach Partners:*

# American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, USC, and other NGOs.

## MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

## References

Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish & Wildlife Service, Sunderland, Massachusetts.

Cooper, T.R., K. Parker, and R.D. Rau. 2008. American woodcock population status, 2008. U.S. Fish and Wildlife Service, Laurel, Maryland. 15 pp.

Keppie, D.M. and R.M. Whiting, Jr. 1994. American Woodcock (*Scolopax minor*), The Birds of North America Online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/100>.

Kelley, James, Scot Williamson and Thomas R. Cooper, eds. 2008. American Woodcock Conservation Plan: A Summary of and Recommendations for Woodcock Conservation in North America. A Wildlife Management Institute Publication, February 2008.

McAuley, D.G., J.R. Longcore, D.A. Clugston, R.B. Allen, A. Weik, S. Williamson, J. Dunn, B. Palmer, K. Evans, W. Staats, G.R. Sepik, and W. Halteman. 2008. Effects of hunting on survival of American woodcock in the Northeast. *Journal of Wildlife Management* 69(4): 1565-1577.

National Audubon Society. 2009. American Woodcock: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 4 March 2010 ([http://ny.audubon.org/PDFs/HRVC\\_AMERICANWOODCOCK.pdf](http://ny.audubon.org/PDFs/HRVC_AMERICANWOODCOCK.pdf)).

NYS Ruffed Grouse Hunting Log to identify core woodcock habitat <http://www.dec.ny.gov/animals/56849.html>.

NYSDEC FAQs on Grouse Hunting and Management (with map) <http://www.dec.ny.gov/outdoor/48393.html>.

## **American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area**

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005 ([http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)).

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Iñigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panjabi, D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website [http://www.partnersinflight.org/cont\\_plan/](http://www.partnersinflight.org/cont_plan/) (VERSION: March 2005).

Sepik, G.F., R.B. Owen, and M.W. Coulter. 1981. A Landowner's Guide to Woodcock Management in the Northeast. Moosehorn National Wildlife Refuge. U.S. Fish and Wildlife Service. 25 pp.

Thogmartin, W.E., J.R. Sauer, and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. *The Journal of Wildlife Management*. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007)  
[http://www.acjv.org/bcr13\\_plan.htm](http://www.acjv.org/bcr13_plan.htm)
- American Woodcock Conservation Plan (Kelley et al. 2008)  
[http://www.timberdoodle.org/sites/default/files/woodcockPlan\\_0.pdf](http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf)
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)  
[http://www.partnersinflight.org/cont\\_plan/default.htm](http://www.partnersinflight.org/cont_plan/default.htm)
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)  
[http://www.wildlifeactionplans.org/pdfs/action\\_plans/ny\\_action\\_plan.pdf](http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)

Woodcock Management Recommendations (NAS 2009):

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).
- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.
- Encourage native trees and shrubs.

## **American Woodcock (*Scolopax minor*): Upper Susquehanna Focal Area**

- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.
- Maintain young, dense forest of at least 5 acres for nesting and feeding.
- Maintain grassy areas near water sources for feeding and display grounds.

# Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area

## Brook Trout Species Action Plan

### FOCAL AREA: UPPER SUSQUEHANNA

#### *Other species benefitting:*

American eel, American shad, longtail salamander, hellbender, wood turtle

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow pH range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in pH caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds within the Susquehanna River watershed as highest priority for protection of brook trout populations.

**Justification for species selection:** The brook trout is a highly prized native sport fish, but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations (NGO), and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire



## **Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area**

eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

**State contribution to overall species population:** Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Susquehanna watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

### **Research needed:**

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC and Trout Unlimited (TU) to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### **Threats and threat assessment:**

1. **Loss of habitat and habitat function;** habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

### **Research needed:**

- Extensive and frequent stream surveys to determine population size.

(Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

- Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

(Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

- Need to locate heritage streams and heritage populations.

## **Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area**

(Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

### **2. Barriers to Migration** (including dams and impassable culverts).

#### **Research needed:**

- Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

(Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

- Identify which known barriers are having an influence on brook trout distribution.

(Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

### **3. Competition from non-native salmonids.**

#### **Research needed:**

- Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

(Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

### **4. Climate change; increased water temperatures.**

#### **Research needed:**

- Identification of climate change related impacts to brook trout.

(Who: National Weather Service, LCC, academics; Cost: unknown at this time)

#### *Partners/potential funding:*

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, Broome County Soil and Water Conservation District (SWCD), Chenango County SWCD, Cortland County SWCD, Steuben County SWCD, Tioga County SWCD, The Nature Conservancy (TNC).

#### *Population goal(s) for New York State:*

## **Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area**

The EBTJV has numerous conservation goals, including “Conserve, enhance or restore brook trout populations”, and “...to perpetuate and restore brook trout populations throughout their historic range”; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Upper Susquehanna watershed. Establishing population goals remains a research need.

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

##### **1. Loss of habitat.**

- a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.
- c. Facilitate habitat preservation through coordination with land trusts.
- d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.
- e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified.
- f. Conduct fish sampling, within the Susquehanna watershed, to evaluate emergent contaminants (FY2012).
- g. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
- h. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

## **Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area**

- 2. Barriers to migration** (including dams and impassable culverts).
  - a. Working with partners, identify and remove barriers.
  - b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.
  - c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.
- 3. Competition from non-native salmonids.**
  - a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.
- 4. Climate change; increased water temperatures.**
  - a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
  - b. Design and construct habitat enhancement projects which provide increased flow, stream shading, pool cover, and increased availability of riffle habitat.

### *Partner organizations:*

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 – 2012

- 1. Loss of habitat.**
  - a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.
    - i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.

## Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area

- ii. Post these fact sheets/BMPs on our website.
  - iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout, especially with regards to Marcellus shale gas exploration, via hydrofracturing of geologic formations (Conservation Planning Assistance [CPA] FY 2011-2013) (CPA).
  - iv. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.
  - v. Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review. (CPA).
  - vi. Develop stream buffer guidelines/BMP and post on website.
- b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW and EC).
- i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).
  - ii. Restoration work via natural stream design on 0.5 miles of Geneganslet Creek (PFW with funding from base funds, NYSDEC, NYSDOT, and TU) (2011).
  - iii. Continuing restoration work via natural stream design on 0.25 miles Canasawacta Creek (PFW with funding from base funds and NRCS) (2011).
  - iv. Restoration work via natural stream design on Wilsey Creek (1/4 mile). (PFW with funding from base funds and NYSDOT) (2011) (3-4 miles from 2011 – 2013) (Funding – NRCS, TU, base funds, Executive Order on the Chesapeake Bay).
  - v. When possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect vernal pools. Consider brook trout when evaluating restoration projects for Richardson Hill NRDAR case (Environmental Contaminants [EC]).
- c. Facilitate habitat preservation through coordination with land trusts or NGO.

## Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area

- i. Work with Upper Susquehanna Coalition and other NGOs to identify parcels for protection.
  - ii. Guide conservation activities in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance (PFW).
  - d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).
    - i. Guide conservation activities in strategic locations forming buffers to protect the watershed from uncontrolled non point source pollution, in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance (PFW).
  - e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.
    - i. Statewide – Conduct a training session for County SWCD staff on natural stream design (PFW – March 2011).
- 2. Barriers to migration** (including dams and impassable culverts).
- a. Working with partners, identify and remove barriers.
    - i. Work with NYSDEC, NRCS, and Upper Susquehanna Conservation alliance to identify projects in 2011 – 2013. Priority projects identified: Genaganslet (1/4 mile); assess Owego, Butternut, Otselic Creeks. (PFW) (Executive Order to Protect the Chesapeake Bay).
  - b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.
    - i. No work indentified at this time.
  - c. Work with NYSDOT Regions 6 and 9 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage (2011 – 2013) (PFW). (1 project confirmed for FY2011)
    - i. Design and install culvert baffle systems with NYSDOT Region 6 and 9 to bury perched culverts as opportunities present themselves within these DOT regions (PFW) (2011 – 2113).

## **Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area**

### **3. Competition from non-native salmonids.**

- a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.
  - i. No work indentified at this time.

### **4. Climate change; increased water temperatures.**

- a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
  - i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.
- b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW) (2011 – 2013).
  - i. Genaganslet (See 1.B.ii above)
  - ii. Canasawacta (See 1.B.iii above)
  - iii. Wilsey Creek (See 1.B.iv above)

## **OUTREACH**

In addition to the web site, there is an EBTJV Google Group (<http://groups.google.com/group/ebtjv>).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of “ongoing activities” on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project Trout in the Classroom.

## **MONITORING**

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are

## **Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area**

successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

- Establish benchmarks for success based on EBTJV.
- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.
- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.
- Seek funding and support for monitoring.

### *Partners*

NYSDEC, SUNY Oneonta, Otsego Land Trust, Noelle Rayman, USDA-NRCS, Upper Susquehanna Coalition, Susquehanna River Basin Commission, NYSDEC Fisheries, Finger Lakes Land Trust, National Park Service, USEPA, U.S. Army Corps of Engineers, Conservation Fund, TU, NYSDEC, LGLFWCO

### *References*

Eastern Brook Trout Joint Venture main website (<http://www.westernbrooktrout.org>).

Eastern Brook Trout Joint Venture data and maps (<http://sain.utk.edu/ebtjv/index.php>).

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (<http://sain.utk.edu/ebtjv/download/priorityscores.php>).

Trout Unlimited Brook Trout Conservation Strategy (<http://www.tu.org/conservation/eastern-conservation/brook-trout>).

New York State Brook Trout Conservation Strategies  
([http://www.easternbrooktrout.org/docs/EBTJV\\_NewYork\\_CS.pdf](http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf))  
([http://www.easternbrooktrout.org/docs/brookie\\_NY.pdf](http://www.easternbrooktrout.org/docs/brookie_NY.pdf)).



# Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

## Eastern Hellbender Species Action Plan

### FOCAL AREA: UPPER SUSQUEHANNA

#### *Other species benefitting:*

brook trout, American shad, American eel, long-tailed salamander, green floater, brook floater, and yellow lampmussel

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The hellbender is an obligately aquatic salamander whose populations have substantially declined in 14 of 17 states within its geographic range over the past several decades. Hellbenders are listed as vulnerable, imperiled or critically imperiled in these states. The two subspecies of hellbender, the Eastern (*Cryptobranchus a. alleganiensis*) and the Ozark Hellbender (*Cryptobranchus a. bishopi*) were listed as “near threatened” on the IUCN (The World Conservation Union) Red List of Threatened Species in 2004. The listing was primarily due to loss of habitat from agricultural practices, mining, clear cutting of riparian, recreation and transportation development, as well as dam construction. The U.S. Fish and Wildlife Service (USFWS) has placed the Ozark Hellbender on the Federal candidate list in 2001 under Section 4 of the Endangered Species Act. A Federal candidate assessment was completed in 2003 for the Eastern Hellbender (Mayasich *et al.* 2003) and a second assessment is currently underway by the USFWS Columbus Field Office to consider potentially listing the Eastern subspecies. Both subspecies are being proposed for inclusion in Appendix III of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) to protect them from international trade pressures. New York State has the Eastern subspecies which is only found in a few populations in the Allegheny and Susquehanna River watersheds. The hellbender has been State listed as special concern since 1983; current review of the State listings by the New York State Department of Environmental Conservation (NYSDEC) indicate that the listing level may be raised to threatened or endangered. Historically, hellbenders were found in substantial numbers, especially in the Allegheny River watershed. Similar to many amphibians, hellbenders are indicators of stream health and with populations at the most northern extent of their range, they face many threats and are vulnerable because they reside in sparse habitat and require flat rocks > 30 cm. They are a long-lived species and are late maturity breeders. Hellbenders are a high priority for the NYSDEC. A recovery plan is in draft (Bell *et al.* 2010). In Pennsylvania, hellbenders are listed in the State Wildlife Action Plan. They are of immediate concern and in need of a status assessment to determine distribution and abundance. Pennsylvania is seeking higher protection, although currently hellbenders can be collected with a fishing license.

**Justification for species selection:** The Eastern Hellbender is a potential Federal candidate species. It is listed as special concern in New York and will likely be elevated under current listing review. The NYSDEC has drafted a recovery plan to increase conservation efforts in the state. Because of its specialized habitat requirements and being an edge-of-range species (exists

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

in patchy habitat), population levels in New York will naturally be low in comparison to core populations. Laboratory work has indicated high genetic diversity in the Allegheny River watershed versus other areas of their geographic range. However, genetic variation in the Susquehanna is largely unknown due to the limited number of individuals present in the New York portion of the watershed. Fourteen of 17 states indicate population declines. The hellbender is the largest amphibian in the State and it only occurs in two watersheds in the State. They are a long-lived (25+ years) species, and are late maturity breeders (5-7yrs).

### Actions/Research needed:

- Assist NYSDEC with generating priority site map.

(FY2011; Partners: New York Field Office [NYFO], NYSDEC, BSC, State University of New York Cortland [SUNY Cortland]; Cost: staff time) (ESA)

- Provide technical assistance pertaining to State recovery plan.

(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)

- Coordinate with the Regional Office, Pennsylvania Field Office, and other Ecological Services (ES) Field Offices for the states of Maryland, Virginia, and West Virginia regarding hellbender conservation efforts to tie-in with greater USFWS strategic habitat planning.

(FY2011; Partners: NYFO; Cost: staff time) (ESA)

- Identify appropriate size of self-sustaining population in each watershed (modeling).
- Identify new sites with required specialized habitat.
- Implement larval searches using established protocols for bank searching.
- Survey deeper water areas using SCUBA.
- Assist NYSDEC with surveys of historic and new sites to estimate current population sizes.

(Possible for FY2011 work; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: unknown at this time) (ESA)

- Identify threats at sites.
- Determine carp impact.
- Determine rusty crayfish impact.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area**

- Identify impacts of predatory fish (i.e. northern pike).
- Cause of abnormalities – possible contaminants research; many individuals observed with abnormalities. Investigate whether this is being observed in the Susquehanna as abnormalities are being found in the Allegheny. NYFO Environmental Contaminants (EC) biologists very interested in doing work.
- Captive propagation – already in place for Allegheny, NYSDEC to explore further for the Susquehanna. It will likely be needed to increase hellbender numbers in this watershed.

**State contribution to overall species population:** Currently, only two hellbenders are known to be found – Susquehanna River watershed and a tributary creek.

### **Threats and threat assessment:**

#### **1. Loss of Habitat**

- a. Increased sedimentation (i.e. causes embeddedness of natural flat rock habitat).
  - i. Road construction.
  - ii. Development.
  - iii. Riparian clearing - riparian trees provide necessary shade to lower water temperature and provide bank stability to prevent erosion and increased sedimentation at a site.

#### **2. Lack of Recruitment.**

- a. Recent surveys in the Allegheny watershed have indicated a shift in age class structure to older individuals. Few larvae and juveniles are found at sites. We do not have a good handle on the age class structure in the Susquehanna watershed, but assume the trend is the same. At this time, of the 4 individuals known in the watershed, all are adults.

#### **3. Stream barriers.**

- a. Dams and/or possible culverts may impede movement.

#### **4. Illegal Collection.**

- a. Collection is primarily for the pet trade. This is a problem in parts of the hellbender geographic range and is likely a problem in New York.

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

### 5. Environmental Contaminants.

- a. Heavy metals, pesticides, and herbicide use are potential threats, sewage treatment plants, and thermal pollution.

### 6. Invasive Species.

- a. The rusty crayfish is very abundant in this watershed and will co-occur under rocks that are also occupied by hellbenders. It is unknown if there is any competition for space and food between the two species. Hellbenders prey on crayfish, but rusty crayfish may consume eggs during the breeding season. We do not know if hellbenders eat rusty crayfish or prefer the native species. We do not know if there are impacts to the different life stages of hellbenders.
  - i. Identify impacts of the invasive and ubiquitous rusty crayfish.
  - ii. Identify if other invasive species impact hellbender populations.

### 7. Predation.

- a. Predation by fishes (i.e. northern pike), habitat disturbance by carp or predation by other animals such as otter, waterbirds or snapping turtles may have some impact on populations.

### 8. Disease.

- a. *Batrachochytrium dendrobatidis*, also known as chytrid fungus, has been discovered in the Susquehanna watershed in New York. One dead hellbender that was found in the mainstem near Conklin, New York, tested positive for chytrid. Other hellbender sites in the watershed need further testing. It is unknown what impacts chytrid has on hellbenders.
  - i. Need to further understand the impacts of chytrid fungus on hellbenders.

### 9. Climate change.

- a. Climate change may lead to flashy streams, stream dry-up, increased UV-B radiation, potential for the increased risk of *Saprolegnia* fungus, less oxygen with increased water temps, and increased mortality due to chytrid fungus. Research is needed to determine any impact climate change may have.
  - i. Identify whether flashy streams change macroinvertebrate populations (review literature).

### **Recovery Goal for NYFO:**

## **Eastern Hellbender (*Cryptobranchus a. alleghaniensis*): Upper Susquehanna Focal Area**

Prevent candidate listing by implementing work identified under Conservation Delivery. Focus for Susquehanna River watershed – Initial focus should be to determine if species is present at historic sites and identify new sites.

### **Example metric:**

For known occupied site in Susquehanna River tributary – 900 m site, estimate ~30 individuals (data based on Blais 1996). As of 2008, one individual has been found at this site.

### **Recovery Criteria (as stated in State Recovery Plan):**

To maintain self-sustaining populations within the Susquehanna River watershed in New York.

To maintain or enhance sufficient quality habitat in the Susquehanna River watershed in New York.

See Bell *et al.* 2010

Eastern Hellbender Status Assessment Report (Mayasich *et al.* 2003)  
[http://www.fws.gov/midwest/eco\\_serv/soc/amphibians/eahe-sa.pdf](http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf).

For a partial list of publications and current research see:

<http://www.hellbenders.org/publications.html> (Humphries 2006)  
<http://www.caudata.org/cig/> (CIG undated)

### *Partners/potential funding:*

NYSDEC, Upper Susquehanna Coalition (USC), Upper Susquehanna Conservation Alliance (USCA), Trout Unlimited (TU), New York State Department of Transportation (NYSDOT), The Nature Conservancy (TNC), Buffalo State College, SUNY College of Environmental Science and Forestry (SUNY-ESF), SUNY Cortland, Lycoming College (PA), Otsego Land Trust (OLT)

### ***Population goal(s) for New York State:***

Unknown at this time.

## **CONSERVATION DESIGN**

### ***Strategies for addressing those threats***

1. [Develop standardized data collection sheets for surveys.](#)

[\(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time\) \(ESA\)](#)

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

2. Assist NYSDEC with developing a database repository.  
(FY2011; Partners: NYSDEC; Cost: staff time) (ESA)
3. Develop decontamination protocol to counter disease (*B.d.*).  
(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)
4. Develop a surveyor list (see bog turtle guidance as model).  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
5. Develop schedule scheme to set priorities for surveys.  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
6. Develop protocols for surveys (see bog turtle guidance as model).  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
7. Develop protocol for PIT tagging.  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
8. Develop sampling protocol for DNA collection.  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
9. Develop sampling protocol for chytrid fungus.  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
10. Develop a training program for hellbender surveys.  
(FY2013; Partners: NYFO, NYSDEC; Cost: staff time)
11. Develop conditions to accompany scientific collectors permits for hellbender work.  
(FY2012; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time)
12. Provide technical assistance with USFWS status assessment (work being done by Columbus Field Office – Jeromy Applegate).  
(FY2011; Partners: NYFO; Cost: staff time) (ESA)

# Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

13. Research what types of funding sources exist in order to conduct surveys, enhance hellbender habitat, captively raise hellbenders, etc.

(FY2011; Partners: NYFO, NYSDEC, BSC, SUNY Cortland; Cost: staff time) (ESA)

**Please refer to the following document for existing strategies:**

Draft *Cryptobranchus alleganiensis* Recovery Plan\* (Bell et al. 2010)

**\*\*The following are some of the ideas outlined in the NYSDEC Recovery Plan. Many details still require further development.**

General: Hold Recovery Meeting with NYSDEC and partners (Completed, FY2010)

## 1. Loss of Habitat.

- a. Increased sedimentation.
  - i. Seek to minimize loss of habitat in the following areas that support hellbenders by influencing regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction.
    - Develop a training program for State and Federal permit processors to increase awareness of hellbender conservation.  
  
(FY2012; Partners: NYFO, NYSDEC, U.S. Army Corps of Engineers [USACE], others? Cost: staff time)
    - Develop conservation measures to minimize impacts and post on website in the form of fact sheets.  
  
(FY2012; Partners: NYFO, NYSDEC, others? Cost: staff time)
    - Determine appropriate buffer size needed around sites.
    - Fence off problematic areas due to cattle grazing along stream margins.
    - Develop fact sheets, other information about appropriate stream buffers, conservation measures for landowners.

## 2. Lack of Recruitment.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area**

- a. NYSDEC is enhancing hellbender habitat by placing additional large rock slabs at sites in the Allegheny watershed. NYSDOT was a major partner as they purchased and stock piled large rock for habitat improvement. Details of future plans for additional sites are currently being outlined by NYSDEC in the Allegheny and discussions have begun for the Susquehanna as well. This project was done as part of the captive propagation plan to add habitat for captive reared individuals. A similar project could be implemented in the Susquehanna.
  - i. Assist NYSDEC with identifying new locations to enhance habitat.
  - ii. Purchase additional large rock slabs.
  - iii. Potential land acquisition in a tributary stream to the Susquehanna. The OLT has 2 landowners interested in hellbender conservation.

### **3. Stream barriers.**

- a. Need to identify barriers to remove, if any:
  - i. East River Mill, Newton Line, Chase Hibbard, American Legion, Willow Point, Rock Bottom (?), Upper Candor, Center Village, M. Robert Beach.
  - ii. Rock Bottom Dam – fish passage likely at dam, would hellbenders use a fish ladder? Trap and transport instead of passage? Additional research is needed to see impacts for water velocity – can hellbenders move through.
  - iii. Identify additional dams and culverts that are problematic to migration that could be removed.
  - iv. Determine the feasibility of providing fish passage for hellbenders.
  - v. Need to have information on genetic diversity in the area to avoid homogenization of populations.
  - vi. Identify one dam to begin plans on to remove Lower Great Lakes Fish and Wildlife Conservation Office/Partners for Fish and Wildlife (LGLFWCO/PFFW) project.

### **4. Illegal collection.**

- a. Inform law enforcement about the high risk of collection.
- b. Educate officers on general hellbender information.

### **5. Environmental contaminants.**



## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area**

- a. Develop an emergency response plan for contaminant spills in hellbender. Streams.
- b. Develop “information” on potential impacts of Marcellus shale drilling on water quality in streams supporting hellbender populations.
- c. Conduct fish sampling to evaluate emergent contaminants.

### **6. Invasive species**

- a. Identify impacts of the invasive and ubiquitous rusty crayfish.

### **7. Predation.**

- a. Determine carp impact.
- b. Identify impacts of predatory fish (i.e. northern pike).

### **8. Disease.**

- a. Develop protocol for chytrid fungus sampling.
- b. Test hellbender sites to determine presence of chytrid fungus.

### **9. Climate change.**

- a. Research is needed to determine any impact climate change may have.

## **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats FY2010-2012

### **1. Loss of Habitat.**

- a. Influence regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction by:
  - i. Develop fact sheets and best management practices (BMP) to minimize impacts to hellbenders.
  - ii. Post these fact sheets/BMP on our website.
  - iii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on hellbenders.

## **Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area**

- b. Enhance stream habitat by placing large flat rocks.
  - i. Assist NYSDEC with determining where enhancement can take place in the Susquehanna.
  - ii. Seek additional funding if needed for this project.

### **2. Lack of Recruitment.**

- a. Captive propagation is underway at the Buffalo Zoo for the Allegheny River Watershed (an action currently underway based on tasks of recovery plan) (Bell *et al.* 2010).
  - i. Provide any technical assistance needed to NYSDEC, SUNY-ESF, and USC regarding Susquehanna headstarting plan.  
  
(FY2011 or 2012; Partners: NYFO, NYSDEC, BSC, Lycoming College, SUNY-ESF, USC; Cost: unknown at this time) (ESA)
  - ii. Assist with determining where egg masses are taken in Susquehanna.
  - iii. Obtain genetic information from reared individuals to make sure hellbenders are released in the right locations.
  - iv. Assist NYSDEC with post monitoring of released captive reared individuals.
  - v. Assist in getting samples so a genetic profile of Susquehanna streams can be completed.

### **3. Stream Barriers.**

- a. Nothing identified in next 2-3 years.

### **4. Illegal collection.**

- a. Nothing identified in this coming year – but is extremely important to address soon.

### **5. Environmental contaminants.**

- a. When possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect hellbender habitat. Consider hellbenders when evaluating restoration projects for Richardson Hill NRDA case.

### **6. Invasive species.**

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

a. Nothing identified in the next 2-3 years.

### 7. Predation.

a. Nothing identified in the next 2-3 years.

### 8. Disease.

a. Nothing identified in the next 2-3 years.

### 9. Climate change.

a. Nothing identified in the next 2-3 years.

## OUTREACH

- Develop a stream/water quality/habitat traveling exhibit  
(FY2012 or 2013; Partners: NYFO; Cost: unknown at this time)
- [Work with BSC on 2011 Hellbender Symposium.](#)  
(FY2011; Partners: NYFO, Buffalo State College, Pittsburgh Zoo, Western Pennsylvania Conservancy; Cost: staff time) (ESA)
- Develop a poster to use at National Fishing Day celebration (Completed; FY2010).
- Develop a hellbender wind sock to accompany poster on hellbender ecology (Completed; FY2010).
- Develop a brochure that promotes recovery (target fishermen).  
(FY2012; Partners: NYFO, NYSDEC; Cost: staff time)
- [Develop a website for hellbender or link to existing websites for outreach and contractors](#)  
(FY2011; Partners: NYFO; Cost: staff time) (ESA, IT)

## MONITORING

- Assist with development of protocols to measure progress/success of habitat restoration projects.

## Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

- Assist with development of protocols to measure progress/success of captive rearing and release of hellbenders.
- Assist with monitoring to measure progress/success of restored habitat and captive reared individuals.

### *References*

Bell, T., R. MacBlane, and B. Wheeler. 2010. Draft *Cryptobranchus alleganiensis* Recovery Plan. New York State Department of Environmental Conservation. Division of Fish, Wildlife and Marine Resources. 52 pp.

Cryptobranchid Interest Group. Undated. Building Partnerships for Giant Salamander Conservation <http://www.caudata.org/cig/>.

Humphries, J. 2006. The Hellbender Homepage <http://www.hellbenders.org/publications.html>.  
Mayasich, D.A., D. Grandmaison, and C. Phillips. 2003. Eastern Hellbender Status Assessment Report. NRRI/TR-2003/09. U.S. Fish and Wildlife Service. 43 pp.  
[http://www.fws.gov/midwest/eco\\_serv/soc/amphibians/eahe-sa.pdf](http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf).

# Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum/A. laterale*): Upper Susquehanna Focal Area

## Jefferson/Blue-spotted Complex Salamander Species Action Plan

### FOCAL AREA: UPPER SUSQUEHANNA

#### *Other species benefitting:*

Blue-spotted salamander, spotted salamander, northern redback salamander, northern spring salamander, four-toed salamander, red-spotted newt, gray tree frog, green frog, pickerel frog, wood frog, northern leopard frog, spring peeper, American toad, spotted turtle, fairy shrimp, and Northeastern bulrush

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** The Jefferson salamander is a member of a “complex” formed when species separated by ice age glaciations came into contact with each other and began interbreeding producing hybrid populations. Jefferson salamanders have a strong affinity for upland forests and reside most of the year in well-drained deciduous or mixed forest, but within 250 to 1600 meters of a small vernal pool or pond, typically surrounded by alder, red maple, button bush, and dogwood. A member of the mole salamander group, they are found beneath leaf litter, loose soil, stones, rotting logs, or in rodent burrows or subterranean burrows that they excavate.

Vernal pools are necessary for reproduction and need to include abundant dead and decaying leaves for cover and overhanging bushes or vegetation for egg deposition. Vernal pools are important for storage and filtration of surface runoff and groundwater recharge. Species that inhabit these pools are often indicators of a healthy ecosystem and are water quality indicators. According to Nature Serve Explorer data, Jefferson salamanders occur in 17 states and Ontario, Canada. Several of these states list status information for this species. Four states (Illinois, Massachusetts, New Hampshire, and Vermont) and Ontario, Canada, list this species as “imperiled.” Populations in Connecticut, Maryland, New Jersey, and West Virginia are considered “vulnerable.” Indiana, Kentucky, Pennsylvania, New York, and Virginia populations are “apparently secure,” but even so, this species is still listed as a species of special concern in New York.

**Justification for species selection:** These species and associates have complex life histories and critical habitat requirements. They require both vernal pool habitat for reproduction and upland forest habitat for foraging, hibernation, and other terrestrial and fossorial activities. Breeding habitat is no longer protected by the Federal Clean Water Act. Wetlands smaller than 12.4 acres are not protected in New York. These species are subject to high mortality as they migrate between habitats, and often over roads. The temporary nature of breeding habitat may be overlooked in development plans. Development plans may protect the pool itself but destroy migratory pathways and non-breeding habitat. Several vernal pool species are either Federal- or

## **Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum*/*A. laterale*): Upper Susquehanna Focal Area**

Stated-listed and include: Northern bulrush – Federally-listed as endangered; Jefferson salamander – State-listed as special concern; and blue-spotted salamander – State-listed as special concern.

**State contribution to overall species population:** Despite the fact that Jefferson salamander populations are found sporadically throughout New York, New York State Herp Atlas data indicate this species to be infrequent in the Upper Susquehanna River basin.

### **Research needed:**

- Conduct surveys to determine current population levels and presence/absence.
- Trend study focusing on State areas where conditions exist for persistent vernal pools in proper landscape settings for conservation.
- Conduct research to document the extent of upland habitat required for Jefferson salamander.
- Develop standardized habitat and population survey protocols to document the character, quality, and extent of occupied habitat.
- Document life history parameters specific to vernal pool species in New York.
  - Age and sex ratios, longevity, age at sexual maturity, survivorship of young, predator-prey relationships, and wetland-upland habitat requirements
- Determine significance of specific threats to populations of vernal pool salamanders and develop management recommendations to address significant threats.
- Need to research existing data on vernal pools – where are they likely to occur (Partners: U.S. Fish and Wildlife Service [USFWS], Upper Susquehanna Coalition [USC], NYSDEC; Cost: staff time)
- Plan a vernal pool meeting where partners can discuss needs and priority goals for vernal pool conservation. [Contact Wildlife Society – Michael Clemmons]. (Partners: USC, NYSDEC, State University of New York – College of Environmental Science and Forestry [SUNY-ESF]; Costs: unknown at this time)

### **Threats and threat assessment:**

1. **Habitat loss** – in the form of filling in vernal pools or modification to adjacent lands which alter hydrology in an area.

### **Research needed:**

## **Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum*/*A. laterale*): Upper Susquehanna Focal Area**

- Identify degraded habitat with restoration potential
2. **Fragmentation of migration corridors** – results in the loss of habitat connectivity for species that breed in vernal pools; includes reduction in patch size, shape, and cause increased edge effects.
  3. **Storm sewers and surface impermeability** - increase runoff and lowers water table.

### **Research needed:**

- Identify problematic storm sewer systems.
  - Identify impermeable surfaces in the vicinity of existing vernal pools.
4. **Climate Change** - dependant on changes in temperature and precipitation regimes.

### **Research needed:**

- Identify vernal pools in areas likely to be impacted by climate change (i.e. changing weather patterns influencing timing of frosts and rainfall).

### *Partners/potential funding:*

Natural Resources Conservation Service (NRCS), USC, Soil and Water Conservation Districts (SWCD), New York State Department of Transportation (NYSDOT), NYSDEC, Land Trusts – Chenango, Southern Madison, Finger Lakes, and Otsego

### *Goal(s) for New York State:*

Establish and protect sufficient and appropriate habitat for amphibian, reptile, and plant species associated with vernal pools that: migrate between uplands and vernal pools, require vernal pools for breeding, and which also require upland habitat for other life history stages.

## **CONSERVATION DESIGN**

### *Strategies for addressing those threats*

1. Identify hot spots where vernal pool species are crossing roads.
2. Assist with road crossing surveys.
3. Maintain a list of project sites to use as possible mitigation.
4. Assist with USC herpetological surveys.

## **Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum*/*A. laterale*): Upper Susquehanna Focal Area**

5. Create map or shape file for possible vernal pool sites for specific areas within the watershed with a view toward protecting vernal pools that are known to support Jefferson's salamanders or identifying potential vernal pool restoration sites.  
(Partners: USFWS; Cost: staff time)
6. Establish central repository for data, potential project areas, and mitigation sites.

### **CONSERVATION DELIVERY**

On-the-ground actions using strategies to address threats for FY 2010 - 2012

#### **1. Habitat loss –**

- a. Work with NYSDEC on wetlands of special concern designation to bring vernal pools under freshwater wetlands protection jurisdiction.
- b. Target USFWS habitat restoration and enhancement projects to benefit vernal pool species.
  - i. Create vernal pool habitat in suitable locations; need to determine how much and where.
  - ii. Work with Partners for Fish and Wildlife (PFW), NYSDEC, USC to identify one project site.
- c. Minimize loss of habitat by influencing regulatory agency decisions and the permitting process regarding:
  - i. Regulated wetland losses; and, regarding
  - ii. Agricultural and forestry practices that diminish vernal pool habitat values for wildlife.  
  
(FY2011; Partners: USFWS, NYSDEC, U.S. Army Corps of Engineers [USACE]; Cost: staff time) (Conservation Planning Assistance [CPA])
- d. Review vernal pool papers (i.e. distance papers, vernal pool mitigation, etc.) and other documentation to better understand impacts to vernal pool species and where vernal pools exist to help influence regulatory agency decisions and the permitting process.  
(Partners: USFWS; Cost: staff time)
- e. Facilitate habitat preservation through coordination with land trusts.



## **Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum*/*A. laterale*): Upper Susquehanna Focal Area**

- f. Preserve, restore, and/or enhance forested wetlands known to support vernal pool species, especially the mole salamanders.
- g. When possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect vernal pools. Consider Jefferson/Blue spotted salamanders when evaluating restoration projects for Richardson Hill NRDA case. (FY2011; Partners: NYSDEC; Cost: staff time) (Environmental Contaminants [EC])
- h. Determine suitable, but unoccupied, habitat for potential reintroduction.
  - i. Determine locations of suitable, but unoccupied, habitat on NYSDEC land or private land for potential introduction of adults and/or eggs.
- i. Work with NYSDEC and others to limit introductions of fish and other predatory species into habitats critical to vernal pool salamanders.
- j. Relocate adult salamanders and/or eggs to suitable but unoccupied habitats on NYSDEC or private lands.
  - i. Would require genetic analysis to maintain genetic diversity.
  - ii. If relocating, need to determine minimum number of eggs/adults needed to establish viable population.
- k. Provide recommendations to reduce habitat destruction and collisions by off-road vehicles in vernal pools occupied by salamanders.
- l. Provide recommendations to limit logging activities around known breeding areas during the breeding and larval development period.
- m. Sewers and surface impermeability increase runoff and lowers water table – identify problematic areas.

### **2. Fragmentation of migration corridors**

- a. Target USFWS habitat restoration and enhancement projects to benefit vernal pool species.
- b. Incorporate means to increase corridors between breeding and non-breeding habitat:
  - i. Influence regulatory agency decisions to incorporate measures to increase corridors between breeding and non-breeding habitat. (FY2011; Partners: USFWS, NYSDEC, USACE; Cost: staff time) (CPA)

## **Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum*/*A. laterale*): Upper Susquehanna Focal Area**

- c. Work with partners to prioritize land acquisition of forested upland tracts adjacent to wetland properties.
- d. Create vernal pools on either side of roads to reduce mortality.
3. **Climate Change** - dependant on changes in temperature and precipitation regimes.
4. **Environmental Contaminants**
  - a. Prepare expedited preassessment document to determine whether Kentucky Avenue Wellfield National Priorities Listed (NPL) Site poses threats to trust resources and opportunity exists for NRDA assessment work. (FY2011: Cost: Staff time) (EC)
  - b. Coordinate Kentucky Avenue Wellfield Biological Technical Assistance Group (BTAG) activities to maximize potential for a remedy which protects wildlife, with U.S. Environmental Protection Agency (USEPA) (EC).

### **OUTREACH**

1. Develop an outreach program for vernal pool conservation for public and private landowners:
  - a. Outline benefits and need for vernal pools.
  - b. Highlight possible detrimental effects caused by human disturbance.
2. Enhance public education to curtail collection/translocation of Species of Greatest Conservation Need (SGCN) salamanders.
  - a. Draft guide that outlines the importance of leaving animals “wild.”
3. Address vernal pools when reviewing permits (CPA).
4. Set up a reporting system (something similar to the Hudson River Estuary Biodiversity Program or USC) – or link below websites to NYFO website

[http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/hrebfsamrc.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrebfsamrc.pdf)  
<http://www.u-s-c.org/html/vpmapping.htm>

Contact Laura Heady, Biodiversity Outreach Coordinator (NYSDEC)

### **MONITORING**

1. Development of protocols to measure progress/success of vernal pool restoration.

## **Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum*/*A. laterale*): Upper Susquehanna Focal Area**

2. Monitoring to measure progress/success of created and protected vernal pools.
  - a. Periodically resurvey areas of known occurrence to detect population trends.

### *References*

New York State Department of Environmental Conservation, Comprehensive Wildlife Conservation Strategy for New York.

<http://www.dec.ny.gov/animals/30483.html>

Upper Susquehanna Coalition vernal pool resources- <http://www.u-s-c.org/html/vplinks.htm>

# Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

## Northeastern Bulrush Species Action Plan

### FOCAL AREA: UPPER SUSQUEHANNA

#### *Other species benefitting:*

Jefferson salamander, blue-spotted salamander, spotted salamander, marbled salamander, fairy shrimp, American toad, cat-tail sedge, false hop sedge, spotted turtle, Blanding's turtle, northern spring salamander, four-toed salamander, gray tree frog, red-spotted newt, northern redback salamander, spring peeper, green frog, pickerel frog, northern leopard frog, wood frog

### BIOLOGICAL PLANNING

#### *Introduction to species*

**Species information:** Northeastern bulrush (*Scirpus ancistrochaetus* Schuyler, Cyperaceae) (NEBR) is a rhizomatous perennial sedge found throughout the northeastern United States in vernal ponds and emergent wetlands. Recently (August 2010), the New York State Natural Heritage Program (NYSNHP), funded via Section 6 of the Endangered Species Act, rediscovered NEBR in Steuben County on private lands that are currently leased for hunting.

The NEBR commonly occurs along the margins and in shallow areas of acidic to circumneutral natural ponds, shallow sinkholes, or wet depressions in areas with varied terrain. This species is not known to occur in artificial or disturbed habitats. Characteristically, the water levels within NEBR associated wetlands fluctuate over the year either through beaver or seasonal activity and often have a dry period in the summer. Wetland areas are generally small and found in conjunction with other small wetland areas where NEBR tends not to occupy all sites (U.S. Fish and Wildlife Service 1993). It has been found that NEBR prefers sites that are not light limited and, therefore, not completely shaded by bordering forest canopies (Lentz and Cipollini 1998). This has important implications for management in light of widespread forest regeneration in the northeast.

Plants are generally 80-120 cm in height with long, linear, leaves that become narrower up the stem. Flowering occurs from mid-June to July with fruit set between July and September. The inflorescence is umbellate and bears several small clusters of brown spikelets. The NEBR can be difficult to separate from dark green bulrush (*Scirpus atrovirens*) and mosquito bulrush (*Scirpus hattorianus*), but when reproductive shoots are present, the characteristically drooping rays of the inflorescence as well as the strongly hooked barbs on the perianth bristles distinguish this species. However, without reproductive shoots, identification becomes more technical. In situ NEBR generally does not co-occur with the former two species, and sterile comparisons should consult the appendix to sterile identification in the Species Recovery Plan (U.S. Fish and Wildlife Service 1993).

**Justification for species selection:** The NEBR is a Federally-listed endangered species (listed endangered 1991, recommended to reclassify threatened 2008) as well as a New York State-

## **Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area**

listed endangered species. As of 2008, there were 113 known and 7 historical sites in Massachusetts, Maryland, New Hampshire, New York, Pennsylvania, Virginia, Vermont, and West Virginia. Approximately half of these sites are located on private lands and are generally unprotected. This species is relatively widespread, but populations vary widely in size from sites with thousands of individuals to sites with <10 individuals. The vast majority of existing sites are found in Pennsylvania (70) and Vermont (22).

The NEBR habitat is fairly specific, forested vernal pools, and as a result, there can be considerable focus on this habitat and its regulation especially with regard to endangered species. However, considerable degradation of these habitats has occurred in the past and still occurs in states with limited wetland acreage requirements such as New York. Listing encourages recovery in this species, especially in those sites on public lands and near public projects in areas with limited regulatory control.

Herbivory is a recognized threat to NEBR as it is located near what are often the only sources of water in upland forests. Herbivore populations have rebounded dramatically in the last 100 years, often to unsustainable levels, especially in areas with limited hunting pressure. In particular, deer populations can place undue browsing pressure on NEBR and prevent successful growth and reproductive efforts (Lentz and Cipollini 1998).

The techniques necessary to understand and promote NEBR recovery have not been adequately determined and threats to this species still exist. All increases in population numbers since listing are apparently due to the location of additional, established populations through intensive surveys. There is no record of a new population establishing, and approximately half of all monitored sites have been found to be decreasing in size (U.S. Fish and Wildlife Service 2008). Continued action is required to attempt to mitigate and correct this trend.

**State contribution to overall species population:** The NEBR has a patchy distribution from Virginia to New Hampshire, but had been found in nearly all northeastern states except New York, until its rediscovery. New York is expected to have an abundance of available habitat and possible populations that will serve to connect the species across its range. The New York population was found in the central portion of a forested vernal pool that was ~1,600 m<sup>2</sup> in size. At this time there is no precise estimate of the number of individuals, although the population was reported to be a near monoculture of NEBR.

### ***Threats and threat assessment:***

Threats (See 5-year review for full assessment):

#### **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Habitat loss to development and physical destruction is the primary threat to this species via the destruction/degradation of vernal wetlands. The New York population was found on private lands that are currently leased for hunting with little development pressure, but

## **Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area**

this habitat is not protected by New York State law. Specific landowner protection agreements have not been established at this time.

**Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:**  
NA.

**Factor C. Disease or predation:**

- A. Herbivory by deer has been shown to have a significant impact on NEBR populations. Herbivory is a common threat for emergent wetland plants, although this may be of limited extent for this population as the property is used primarily for hunting and hunting pressure is likely high.

**Factor D. The inadequacy of existing regulatory mechanisms:**

- A. Wetlands smaller than 12.4 acres are generally not protected by the New York State Department of Environmental Conservation (NYSDEC); therefore, continued degradation of vernal pool habitats will continue to occur, especially when projects occur during times when vernal pools may be dry and easily overlooked.

**Factor E. Other natural or manmade factors affecting its continued existence:**

- A. Light restriction through canopy closure may negatively affect NEBR as it is believed to prefer sites with a semi-open canopy. Additionally, large changes in forest composition as well as a myriad of other activities may alter or degrade the hydrologic component of the vernal habitats that the NEBR prefers. Lowering of water levels may allow excess competition, while raising of water levels may cause population decline due to flooding. Pollution inputs from sediment, herbicides, etc., may also cause population declines.

### ***Recovery Goals***

***Range-wide Recovery Goals/Objectives:*** According to the Recovery Plan (U.S. Fish and Wildlife Service 1993): Permanently protect 20 populations, monitor 20 representative populations and show that they are stable or increasing, and understand the species' life history in order to provide effective management. These goals were assessed in the 5-Year Review (U.S. Fish and Wildlife Service 2008) and found to be partially met. The NEBR was recommended to be downlisted to threatened, but new recovery objectives for delisting were not clearly defined in this document.

***Conservation goal(s) for New York State:*** Increase knowledge of the distribution and abundance of NEBR in New York and promote viability in known populations in order to contribute to the known viable population level needed to delist the species.

**Research/Actions needed<sup>29</sup>:**

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<sup>29</sup> Note that actions listed in orange are planned for Fiscal Year (FY) 2011.

## **Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area**

As this population is newly discovered, initial actions will focus primarily on biological planning research activities in order to understand the habitat, dynamics, and viability of this population as well as locate additional populations. Specifically the following:

- A. Contact the landowner of the single NEBR site in New York State for initial conversations about conservation (FY 2011) Recovery Task 1.4 (Endangered Species [ES]).
- B. Conduct an initial count at the known population in order to determine population size and reproductive effort, and conduct these counts every 5 years in order to understand these factors over time and population viability (FY 2011, NYFO Student Temporary Employment Program (STEP) Staff transitioning to NYSNHP) Recovery Task 4 (ES).
- C. Assess the impact of threats (e.g., herbivory, hydrology) at the known population and evaluate possible management techniques, if needed (FY 2011, NYFO STEP Staff) Recovery Tasks 1.2 and 6.1 (ES).
- D. Coordinate with Upper Susquehanna Coalition (USC) with regard to vernal pool locations and management (ES).
  1. Attend natural resource planning meeting, January 12, 2011, Recovery Task 6.1 (ES).
- E. Submit funding proposal for NYSNHP to survey for additional populations (FY 2011 – FY 2012, Cost: \$10,000) Recovery Task 2.3 (ES).
- F. Assist with surveys for additional NEBR populations.

### **CONSERVATION DESIGN**

#### ***Strategies for addressing those threats***

Please go to these documents for the existing strategies:

- Recovery Plan, First Revision (1993) [http://ecos.fws.gov/docs/recovery\\_plan/930825.pdf](http://ecos.fws.gov/docs/recovery_plan/930825.pdf)
- 5-Year Review (2008) [http://ecos.fws.gov/docs/five\\_year\\_review/doc2618.pdf](http://ecos.fws.gov/docs/five_year_review/doc2618.pdf)
  - Next 5-year review anticipated in 2013

#### **Research/Actions needed:**

Specific actions for the next 3 years addressing conservation design include the following:

- A. Coordinate with landowner on the development of management techniques to alleviate light-limitation, herbivory, or hydrologic impacts, if necessary (FY 2012-2013, Cost: \$0) Recovery Task 1.4.

# Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

## CONSERVATION DELIVERY

*On- the-ground actions using strategies to address threats for FY 2010 – 2012*

**Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:**

- A. Limit possible habitat and physical destruction
  1. Contact the landowner of the single NEBR site in New York State for initial conversations about conservation (FY2011) Recovery Task 1.4 (ES).
  2. Develop cooperative agreement to protect the known population from human impacts (FY 2012 – FY 2013, Cost: \$0) Recovery Task 1.4.
  3. Conduct training for U.S. Army Corps of Engineers in identifying potential habitat and the plant (FY2011) Recovery Task 1.51 (ES).

**Factor B. Disease or predation:** No actions planned at this time.

**Factor C. The inadequacy of existing regulatory mechanisms:** No actions planned at this time.

**Factor D. Other natural or manmade factors affecting its continued existence:** No actions planned at this time.

## OUTREACH

- Construct a NEBR web page for the NYFO site linking information resources from Pennsylvania Field Office (PAFO) (FY2011, Cost: \$0) Recovery Task 9 (ES and IT).
- Develop NEBR Fact Sheet (ES).

## MONITORING

- A. No monitoring planned at this time.

### *Partners*

Private landowners, NYSDEC, NYSNHP, USC

### *References*

Lentz, K.A., and D.F. Cipollini. 1998. Effect of light and simulated herbivory on growth of endangered northeastern bulrush, shape *Scirpus ancistrochaetus* Schuyler. *Plant Ecology* 139:125–131.

U.S. Fish and Wildlife Service. 1993. Northeastern Bulrush (*Scirpus ancistrochaetus*) Recovery



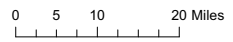
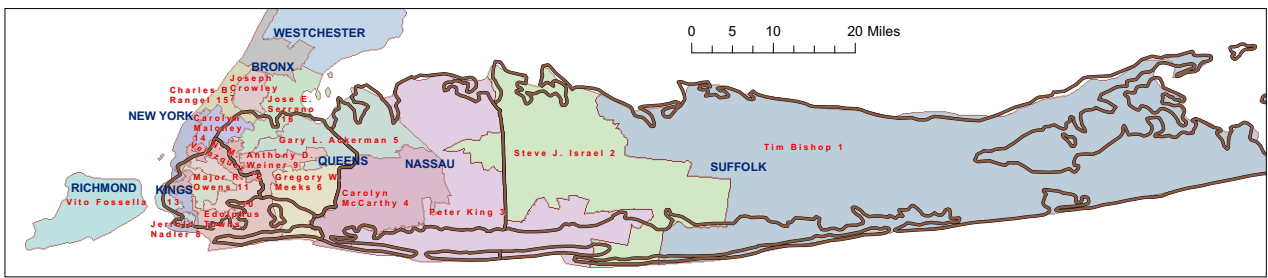
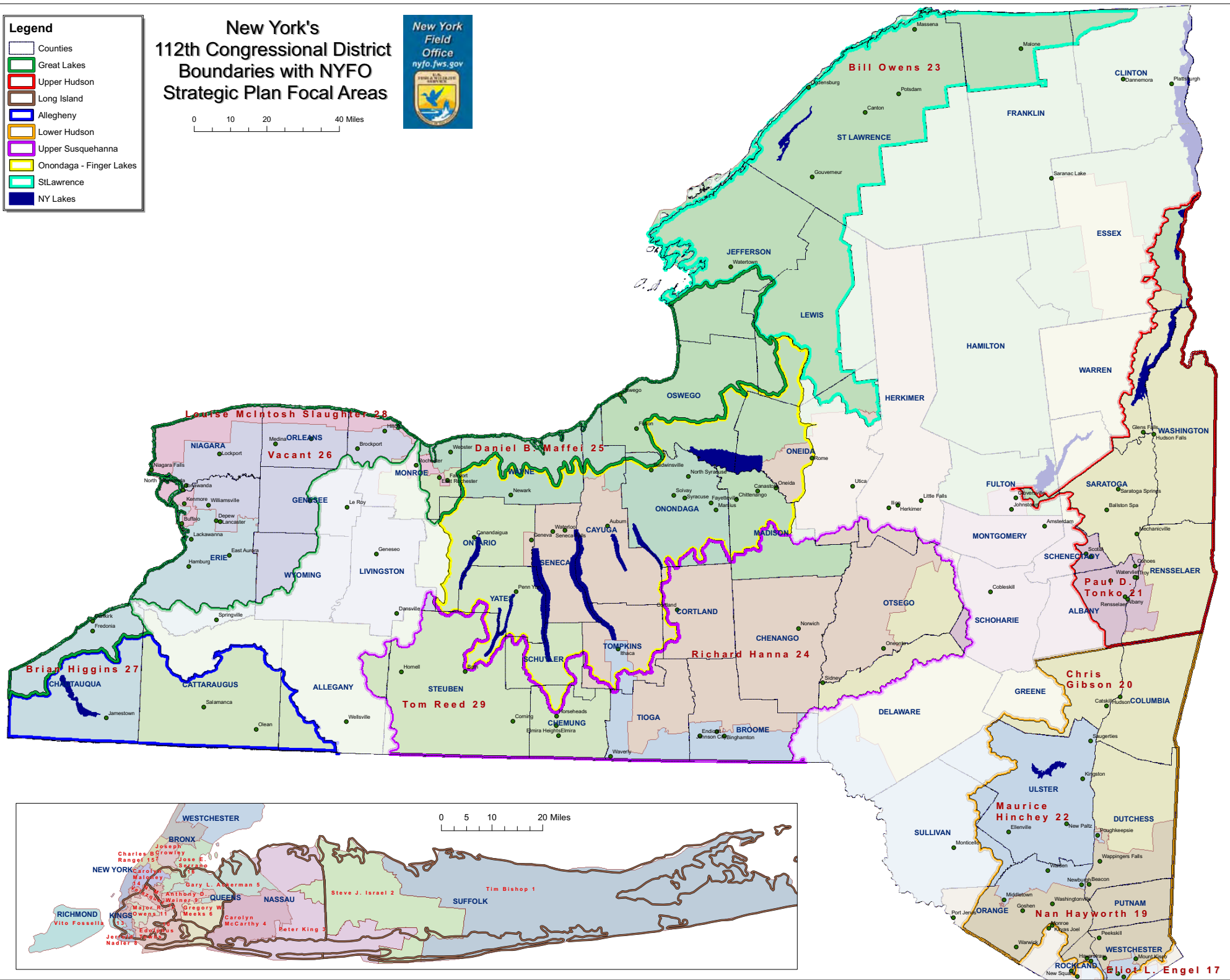
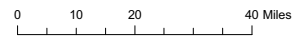
## **Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area**

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- Legend**
- Counties
  - Great Lakes
  - Upper Hudson
  - Long Island
  - Allegheny
  - Lower Hudson
  - Upper Susquehanna
  - Onondaga - Finger Lakes
  - StLawrence
  - NY Lakes

# New York's 112th Congressional District Boundaries with NYFO Strategic Plan Focal Areas



Eliot L. Engel 17

## Appendix 2: Focal Area Summary Table

SPECIES	FOCAL AREA							
	Allegheny	Finger Lks/Onon	Great Lakes	Susque.	St. Law.	Lower Hud.	Upper Hud.	Long Island
Cerulean Warbler	X	X	X					
Golden-Winged Warbler	X				X			
Woodcock			X	X	X		X	
Field Sparrow							X	
Black Duck		X	X		X		X	
Broad Winged Hawk	X		X					
Bobolink			X		X			
Common Tern			X		X			
Saltmarsh Sharp-tailed Sparrow								X
Bald Eagle			X		X	X		
Brook Trout	X	X	X	X			X	
Lake Sturgeon		X	X		X			
American Eel					X	X		
American Shad				X				
Northern Pike					X			
Spotted Darter	X							
Hellbender	X			X				
Blandings Turtle					X	X	X	
Bog Turtle		X	X			X		
Indiana Bat		X	X		X	X	X	
Massasauga		X	X					
Piping Plover			X					X
Clubshell	X							
Chittenango Ovate Amber Snail		X						
Dwarf Wedgemussel						X		
New England Cottontail						X	X	
American Hart's Tongue Fern		X						
Karner Blue Butterfly							X	
Sandplain Gerardia								X
Seabeach Amaranth								X
Roseate Tern								X
Leedy's Roseroot		X						
Northern Monkshood						X		
Houghton's Goldenrod			X					
Rayed Bean	X							
Red Knot								X
Jefferson's Salamander				X				
Small Whorled Pogonia						X		
Northeastern Bulrush				X				
Tiger Salamander								X
Winter Flounder								X

### Appendix 3: Acronyms and Abbreviations

ACJV	Atlantic Coast Joint Venture
ACUB	Army Compatible Use Buffer
AFS	American Fisheries Society
AHTF	American hart's-tongue fern
AMM	avoidance and minimization measures
AMNH	American Museum of Natural History
AOC	Area of Concern
APBPC	Albany Pine Bush Preserve Commission
ASMFC	Atlantic States Marine Fisheries Commission
BBS	Breeding Bird Survey
BCA	Bird Conservation Area
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practices
BO	Biological Opinion
BOCES	Board of Cooperative Educational Services
BSC	Buffalo State College
BTAG	Biological Technical Assistance Group
CCAA	Candidate Conservation Agreement with Assurances
CEWAP	Cerulean Warbler Atlas Project
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
COAS	Chittenango ovate amber snail
CPA	Conservation Planning Assistance
CPUE	catch per unit effort
CRP	Conservation Reserve Program
CSO	combined sewer overflows
CSWMA	Cicero Swamp Wildlife Management Area
CWA	Clean Water Act
dbh	diameter at breast height
DRBC	Delaware River Basin Commission
DU	Ducks Unlimited
DWM	Dwarf wedgemussel
EBTJV	Eastern Brook Trout Joint Venture
EC	Environmental Contaminants
ECOS	Environmental Conservation Online System
EEE	Eastern Equine Encephalitis
ELFO	East Lansing Field Office
EMR	Eastern massasauga rattlesnake
EPF	Environmental Protection Fund
ES/ESA	Endangered Species/Endangered Species Act
ESG	Eel Study Group

ESU	evolutionary significant unit
FAC	Fisheries Advisory Council
FEMA	Federal Emergency Management Agency
FEMRF	Fish Enhancement, Mitigation, and Research Fund
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIIS	Fire Island National Seashore
FIMP	Fire Island to Montauk Point
FLLT	Finger Lakes Land Trust
FMCS	Freshwater Mollusk Conservation Society
FOIA	Freedom of Information Act
FWCA	Fish and Wildlife Coordination Act
FWINS	Fish and Wildlife Information Needs System
GIS	Geographic Information System
GLRI	Great Lakes Restoration Initiative
GWWA	Golden-winged warbler
ha	hectare
HCP	Habitat Conservation Plan
HOGO	Houghton's goldenrod
IEPG	International Eel Passage Group
IJC	International Joint Commission
INAD	Investigational New Animal Drugs
IPN	infectious pancreatic necrosis
IT	Information Technology
IUCN	International Union for Conservation of Nature
Kbb	Karner blue butterfly
LCC	Landscape Conservation Cooperatives
LCFWRO	Lake Champlain Fish and Wildlife Resources Office
LE	Law Enforcement (USFWS)
LGLFWCO	Lower Great Lakes Fish and Wildlife Conservation Office
LIFO	Long Island Field Office
LINWRC	Long Island National Wildlife Refuge Complex
MBRT	Mitigation Bank Review Teams
MRNFQ	ministère des Ressources Naturelles et de la Faune Quebec
mt	metric ton
NAS	National Audubon Society
NAWMP	North America Waterfowl Management Plan
NBII	National Biological Information Infrastructure
NEBR	Northeastern bulrush
NEC	New England cottontail
NEFO	New England Field Office
NFWF	National Fish and Wildlife Foundation
NGO	non-governmental organizations

NJFO	New Jersey Field Office
NLCD	National Land Cover Data
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRDAR	Natural Resource Damage Assessment and Restoration
NWR	National Wildlife Refuge
NYFO	New York Field Office
NYPA	New York Power Authority
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Agency
NYSFA	New York State Flora Association
NYSG	New York Sea Grant
NYSNHP	New York State Natural Heritage Program
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation
NYSWF	New York State Wetlands Forum
OBI	Ontario Bay Initiative
OMNR	Ontario Ministry of Natural Resources
ORV	off-road vehicles
PAFO	Pennsylvania Field Office
Park	Chittenango Falls State Park
PFW	Partners for Fish and Wildlife
PIF	Partners In Flight
PPLPRU	Prairie Peninsula Lake Plain Recovery Unit
ppt	parts per thousand
PRP	potentially responsible parties
pva	population viability assessment
RDC	Regional Data Collection/Call
RFP	request for proposals
RGS	Ruffed Grouse Society
RO	Regional Office
ROW	right-of-way
RU	Recovery Unit
SCEP	Student Career Experience Program
SDM	shared decision-making
Seaway	St. Lawrence Seaway
SEQRA	State Environmental Quality Review Act
SGNC	Species of Greatest Conservation Need
SHA	Safe Harbor Agreement

SNENYB	Southern New England/New York Bight
SRAFRC	Susquehanna River Anadromous Fish Restoration Commission
SRBC	Susquehanna River Basin Commission
SSP	Science Support Partnership
STEP	Student Temporary Employment Program
STR	Save The River
SUNY	State University of New York
SUNY-Cortland	Cortland College
SUNY-ESF	College of Environmental Science and Forestry
SUNY-Oswego	Oswego College
SUNY-Potsdam	Potsdam College
SWANCC	Solid Waste Association of Northern Cook County
SWCD	Soil and Water Conservation District
SWG	State Wildlife Grant
SWP	Small whorled pogonia
TBD	to be determined
TIC	Trout in the Classroom
TILT	Thousand Islands Land Trust
TNC	The Nature Conservancy
TU	Trout Unlimited
USACE	U.S. Army Corps of Engineers
USC	Upper Susquehanna Coalition
USCA	Upper Susquehanna Conservation Alliance
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCS	Wildlife Conservation Society
WHIP	Wildlife Habitat Incentives Program
WMA	Wildlife Management Area
WMI	Wildlife Management Institute
WNS	White-nose syndrome
WRP	Wetlands Reserve Program
WVFO	West Virginia Field Office

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-1	Great Lakes, St. Lawrence	American black duck	CPA	Coordinate with FWS Region 3 relative to potential impacts from offshore wind projects (determine if offshore wind projects could have a negative impact to waterfowl.
CPA-2	St. Lawrence	American black duck	CPA	Influence other agencies and the International Joint Commission decisions on Lake and River water level management by providing substantive comments on proposed water level regulation protocol.
CPA-3	Great Lakes	American black duck	CPA	Participate in Mitigation Banking Review Teams for Rochester Cornerstone and Raymond Road mitigation banking teams to review and authorize mitigation banks.
CPA-4	Finger Lakes/Onondaga, Great Lakes, St. Lawrence, Upper Hudson	American black duck	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
CPA-5	Great Lakes, St. Lawrence	American black duck	CPA	Provide substantive comments on proposed wind farms. including the Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie and Ontario Wind Farm proposals to both Federal, State and local agencies with regulatory influence over windpower project siting and operation.
CPA-6	Lower Hudson	American eel	CPA	Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews : Normanskill, Stuyvesant Falls.
CPA-7	St. Lawrence	American eel	CPA	Work with MRNFQ through International Eel Passage Group re. overfishing.
CPA-8	St. Lawrence	American eel	CPA	Minimize mortality on the Oswegatchie River through the FERC licensing process: provide fish protection and downstream passage at two developments of the Oswegatchie River Project ; investigate opportunities to reopen the license at Ogdensburg to provide fish protection and downstream passage.
CPA-9	St. Lawrence	American eel	CPA	Minimize mortality on the St. Regis River through the FERC licensing process: investigate decommissioning/dam removal during Hogansburg relicensing ; investigate fish protection and passage alternatives at Hogansburg.
CPA-10	Lower Hudson, St. Lawrence	American eel	CPA	Review dredging projects for impacts to eels.
CPA-11	St. Lawrence	American eel	CPA	Seek to minimize loss of habitat value by influencing FERC minimum flow decisions: Green Island.



Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-12	Lower Hudson, St. Lawrence	American eel	CPA	Seek to minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, and dredging and placement of fill in streams and wetlands.
CPA-13	Lower Hudson, St. Lawrence	American eel	CPA	Seek to minimize loss of habitat value by influencing FERC minimum flow decisions.
CPA-14	Upper Susquehanna	American shad	CPA	Assist regulatory agencies and the public in providing recommendations for reducing sediment non-point source pollution through best management strategies in priority watersheds: Butternut, Unadilla, Genegantslet, Owego Creek, Tioughnioga .
CPA-15	Upper Susquehanna	American shad	CPA	Provide stream protection guidelines via CPA permit and project review.
CPA-16	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes.
CPA-17	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current.
CPA-18	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Investigate options for funding to assist the state with post-listing activities.
CPA-19	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles.
CPA-20	Lower Hudson	Bald eagle	CPA	Manage assessment for FWS for the Hudson River NRDA; review bald eagle data and assess status of injury.
CPA-21	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Meet with new Northern BGEPA coordinator to discuss an approach to compliance.
CPA-22	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Provide substantive comments to the regulatory agencies that provide best management practices, mitigation recommendations for eagle conservation when in suitable habitat.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-23	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat.
CPA-24	Lower Hudson	Bald eagle	CPA	Send letter to rail companies reminding them of need to pursue authorization of incidental take; meet with NYSDEC, SOL-NE, BE coordinator and LE to strategize next steps, by mid November 2010; by 31 December, 2010, convene a multiparty meeting to discuss next steps with the rail companies and their attorneys.
CPA-25	Great Lakes, St. Lawrence, Lower Hudson	Bald eagle	CPA	Work with the NYSDEC, industry, other Field Offices, Regional Office and species experts to identify advanced conservation practices which will avoid and minimize take of eagles and other large raptors.
CPA-26	Lower Hudson, St. Lawrence, Upper Hudson	Blanding's turtle	CPA	Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species.
CPA-27	Lower Hudson, St. Lawrence, Upper Hudson	Blanding's turtle	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles.
CPA-28	St. Lawrence	Blanding's turtle	CPA	Work with the New York Power Authority to monitor success of the installed nesting berm project (required as condition of hydropower relicensing).
CPA-29	Great Lakes, St. Lawrence	Bobolink	CPA	Prioritize permit review in grassland habitat.
CPA-30	Allegheny	Broad-winged hawk	CPA	Participate in Hawk Watch sites/banding stations (Chautauqua Ridge).
CPA-31	Great Lakes	Broad-winged hawk	CPA	Participate in Hawk Watch sites/banding stations (Derby Hill).
CPA-32	Great Lakes	Broad-winged hawk	CPA	Prioritize permit review in breeding areas of this species (forests and lakeshore); influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
CPA-33	Allegheny, Great Lakes	Broad-winged hawk	CPA	Provide substantive Federal agency comments on proposed Federal actions regarding wind energy projects to minimize impacts to this species; coordinate with other offices involved in wind power project siting to assess potential for additive effects to the species in other parts of the species range including the length of their migratory routes (through Pennsylvania for example).

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-34	Allegheny, Great Lakes	Broad-winged hawk	CPA	Provide substantive Federal agency comments on proposed Federal agency actions (including land development) with likely adverse impacts to this species and/or its habitat.
CPA-35	Allegheny	Broad-winged hawk	CPA	Review energy development projects proposed in large intact blocks of forest habitat and recommend siting adjustments.
CPA-36	Great Lakes	Broad-winged hawk	CPA	Review energy development projects proposed in near lakeshore areas, and in large intact blocks of forest habitat. If expansion of the facilities at Nine Mile Point, Oswego County, goes forward, work with other agencies and the developer to provide for continued availability of broad winged hawk breeding, foraging and resting areas along the south shore of Lake Ontario. Provide recommendations for forest patch size that needs to be maintained, and habitat connections to wetlands for foraging.
CPA-37	Allegheny	Broad-winged hawk	CPA	Review wind energy projects to minimize impacts to this species by directing turbine placement away from large tracts of intact forest.
CPA-38	Great Lakes	Broad-winged hawk	CPA	Review wind energy projects to minimize impacts to this species by direction turbine placement away from large tracts of intact forest, and away from the lakeshore areas.
CPA-39	Allegheny	Broad-winged hawk	CPA	Seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured.
CPA-40	Allegheny, Great Lakes	Broad-winged hawk	CPA	Seek to influence regulatory agency decisions by providing comments on projects which may result in long term impacts on habitat structure.
CPA-41	Allegheny, Great Lakes	Broad-winged hawk	CPA	Seek to influence regulatory agency decisions by providing input into conservation measures which would minimize impacts of development in forested areas near the lakeshore.
CPA-42	Finger Lakes/ Onondaga, Great Lakes, Upper Susquehanna, Upper Hudson	Brook trout	CPA	Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software.
CPA-43	Upper Susquehanna	Brook trout	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout, especially with regards to Marcellus shale gas exploration, via hydrofracturing of geologic formations.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-44	Allegheny, Finger Lakes/Onondaga, Great Lakes	Cerulean warbler	CPA	Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts.
CPA-45	Allegheny, Finger Lakes/Onondaga, Great Lakes	Cerulean warbler	CPA	Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act process.
CPA-46	Finger Lakes/Onondaga	Cerulean warbler	CPA	Evaluate impact of wind turbines at specific sites (Alabama Ledge, Bishop, Cortland, Leicester, Enfield, Paragon, etc.); provide technical assistance and review monitoring reports.
CPA-47	Allegheny, Great Lakes	Cerulean warbler	CPA	Evaluate impact of wind turbines at specific sites (Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario, etc.); assist with monitoring.
CPA-48	Allegheny	Cerulean warbler	CPA	Evaluate impact of wind turbines in Allegany (Allegany Wind Farm in the Town of Allegany); assist with monitoring.
CPA-49	Allegheny	Cerulean warbler	CPA	Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess affects this will have on breeding habitat for the warbler.
CPA-50	Allegheny, Finger Lakes/Onondaga, Great Lakes	Cerulean warbler	CPA	Explore development of additional guidance based on species found in New York State; geographic patterns of migratory bat and bird use.
CPA-51	Allegheny, Finger Lakes/Onondaga, Great Lakes	Cerulean warbler	CPA	Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
CPA-52	Finger Lakes/Onondaga	Cerulean warbler	CPA	Landscape planning for Owasco Flats.
CPA-53	Great Lakes, St. Lawrence	Common tern	CPA	Great Lakes Colonial Waterbird Surveys conducted every 10 years - determine NY status: survey should be occurring soon.
CPA-54	Great Lakes, St. Lawrence	Common tern	CPA	Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat.
CPA-55	St. Lawrence	Common tern	CPA	Provide substantive Federal agency comments on the NYPA Common Tern Habitat Improvement Project.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-56	Upper Hudson	Field sparrow	CPA	Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to field sparrows and/or their habitat based on identification of priority grassland habitats.
CPA-57	Allegheny	Golden-winged warbler	CPA	A NYFO Outreach representative will join the Northeast PIF Working Group. and share with NYFO staff as a FWS information resource.
CPA-58	Allegheny, St. Lawrence	Golden-winged warbler	CPA	Contact John Confer, Ithaca College, and communicate results of conversation to NYFO staff.
CPA-59	Allegheny, St. Lawrence	Golden-winged warbler	CPA	Review documentation and incidence of brown-headed cowbird parasitism upon this species in Allegheny and St. Lawrence watersheds and New York State: review literature; determine whether annual monitoring of nests of this species is presently ongoing in these watersheds and New York; produce a summary of this review to be shared with NYFO staff.
CPA-60	Allegheny, St. Lawrence	Golden-winged warbler	CPA	Review literature on hybridization with golden-winged warbler and gather information.
CPA-61	Allegheny	Golden-winged warbler	CPA	Review Marcellus shale gas development projects to minimize impacts to this species; contact NYSDEC to determine areas where permits have been issued for Marcellus shale gas development.
CPA-62	Allegheny, St. Lawrence	Golden-winged warbler	CPA	Review wind energy projects within the watershed to minimize impacts to this species.
CPA-63	Upper Susquehanna	Jefferson's salamander	CPA	Address vernal pools when reviewing permits.
CPA-64	Upper Susquehanna	Jefferson's salamander	CPA	Incorporate means to increase corridors between breeding and non-breeding habitat: influence regulatory agency decisions to incorporate measures to increase corridors between breeding and non-breeding habitat.
CPA-65	Upper Susquehanna	Jefferson's salamander	CPA	Minimize loss of habitat by influencing regulatory agency decisions and the permitting process regarding: regulated wetland losses; agricultural and forestry practices that diminish vernal pool habitat values for wildlife.
CPA-66	St. Lawrence	Lake sturgeon	CPA	Provide passage recommendations related to the relicensing of hydroelectric power generating facilities on tributaries to the St. Lawrence River, specifically the Oswegatchie River (Eel Weir Dam and Huevelton Dam).
CPA-67	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Lake sturgeon	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon.
CPA-68	St. Lawrence	Lake sturgeon	CPA	Work with New York Power Authority to locate and place up to two spawning substrate beds below the St. Lawrence Power Project.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-69	St. Lawrence	Northern pike	CPA	Provide substantive Federal agency comments on proposed actions with likely adverse impacts to northern pike and/or their habitat.
CPA-70	St. Lawrence	Northern pike	CPA	Seek to influence regulatory agencies regarding land use practices by providing substantive comments on agency actions (e.g. NRCS State Technical Committee).
CPA-71	Allegheny	Spotted darter	CPA	Work on culvert design criteria as a member of the New York Culvert Working Group.
CPA-72	Allegheny	Spotted darter	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on spotted darter, including natural gas/oil extraction.
CPA-73	Lower Hudson	American eel	CPA & EC	Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat.
CPA-74	Great Lakes	Broad-winged hawk	CPA & EC	Seek to influence regulatory agency decisions; seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured. Seek to minimize use of pesticides in new developments to ensure viable populations of amphibian prey; minimized use of pesticides to control mosquitoes; sprays will also impact larger insects which are an important prey item for broad-wings.
CPA-75	Great Lakes	Brook trout	CPA & EC	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout.
CPA-76	Finger Lakes/ Onondaga	Chittenango ovate amber snail	CPA & EC & ESA	Provide input into State and Federally-permitted activities which involve Chittenango Creek, upstream of the Falls as well as other permitted activities that may impact water quality in the Creek.
CPA-77	St. Lawrence, Lower Hudson	American eel	CPA & ESA	Address status assessment and listing proposal.
CPA-78	Lower Hudson	Bog turtle	CPA & ESA	Recommend surveys for this species during project reviews.
CPA-79	Finger Lakes/ Onondaga, Great Lakes	Massasauga rattlesnake	CPA & ESA	Provide substantive comments on proposed actions with potential impacts on this species.
CPA-80	Great Lakes	Piping plover	CPA & ESA	Request surveys for this species prior to work done in critical habitat areas.
CPA-81	St. Lawrence	American eel	CPA & FEMRF	Attend annual IEPG to address overfishing issues.
CPA-82	St. Lawrence	American eel	CPA & FEMRF	Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts; draft plan has been completed to address downstream passage in the St. Lawrence.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
CPA-83	St. Lawrence	American eel	CPA & FEMRF	Hold at least two FEMRF Eel Study Group meetings annually to further efforts towards proposed approach to address turbine mortality ; the Eel Study Group will review FEMRF eel project proposals.
CPA-84	St. Lawrence	American eel	CPA & FEMRF	Hold at least two Fisheries Advisory Council meetings annually to discuss FEMRF proposals.
CPA-85	St. Lawrence	American eel	CPA & FEMRF	Lead International Eel Passage Group meetings; develop and seek funding approaches to address turbine mortality through trap/transport alternatives to foster international support.
CPA-86	St. Lawrence	Northern pike	CPA & FEMRF	Attend meetings with other organization/agencies to gain insight into their efforts towards northern pike habitat restoration (e.g. American Fisheries Society).
CPA-87	St. Lawrence	Northern pike	CPA & FEMRF	Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan.
CPA-88	St. Lawrence	Northern pike	CPA & FEMRF	Provide substantive comments on the following projects with the conservation of northern pike and their recovery as one of our foci: Massena Electric Development, Eel Weir Dam, Heuvelton Dam.
CPA-89	St. Lawrence	Northern pike	CPA & FEMRF	Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g. U.S. Army Corps of Engineers 404 permits, FERC relicensing, and license compliance work).
CPA-90	St. Lawrence	American eel	CPA & FEMRF & PFW	Coordinate with developing Great Lakes Landscape Conservation Cooperative and Great Lakes Fish Habitat Partnership.
CPA-91	Upper Susquehanna	American shad	CPA & IT	Distribute BMP information on our website.
CPA-92	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	American black duck	CPA & PFW	Develop fact sheets and best management practices to minimize impacts to black ducks.
CPA-93	Finger Lakes/Onondaga	Brook trout	CPA & PFW	Coordinate with partners to identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
CPA-94	Great Lakes, St. Lawrence	Bobolink	CPA & PFW & IT	Analyze existing areas of habitat to determine potential breeding areas; analyze breeding bird survey data to focus efforts.
EC-1	St. Lawrence	American black duck	EC	Consider black duck habitat restoration when developing St. Lawrence NRDAR case restoration.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
EC-2	Upper Hudson	American black duck	EC	Coordinate Hudson River PCBs Site BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
EC-3	Finger Lakes/ Onondaga	American black duck	EC	Coordinate Onondaga Lake Superfund Site BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
EC-4	Finger Lakes/Onondaga	American black duck	EC	Develop Onondaga NRDAR case; consider black duck habitat restoration when developing restoration.
EC-5	Upper Hudson	American black duck	EC	Manage assessment for FWS for the Hudson River NRDA; monitor waterfowl PCB levels and determine potential injuries.
EC-6	Great Lakes	American black duck	EC	Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea (of the Buffalo/Niagara Rivers NRDA case); if/when possible, use NRDAR funds toward black duck habitat restoration.
EC-7	Great Lakes	American black duck	EC	Monitor wetland habitat at Joseph Davis State Park (Love Canal Settlement).
EC-8	Great Lakes	American black duck	EC	Prepare expedited preassessment document to determine whether PCC Gowanda NPL Site poses threats to trust resources and opportunity exists for NRDA assessment work.
EC-9	St. Lawrence, Lower Hudson	American eel	EC	Determine if contaminants are a significant threat to eels; continue with the second year of the funded Off Refuge laboratory study, Reproductive Effects of Contaminants on Artificially Matured and Fertilized American eels.
EC-10	Lower Hudson	American eel	EC	Manage assessment for FWS for the Hudson River NRDA; review results of fish toxicity pilot study and determine next steps; consider restoration projects that benefit American eel, if possible.
EC-11	St. Lawrence	American eel	EC	Manage the St. Lawrence River NRDA case; consider restoration projects that benefit American eel, if possible.
EC-12	Upper Susquehanna	American shad	EC	Conduct fish sampling, within the Susquehanna watershed, to evaluate emergent contaminants.
EC-13	Upper Hudson	American woodcock	EC	Manage assessment for FWS for the Hudson River NRDA; assess avian injury for the Hudson River NRDA, including peer review of avian studies
EC-14	St. Lawrence	Blanding's turtle	EC	Consider Blanding's turtle restoration projects in settlement negotiations regarding St. Lawrence NRDA.
EC-15	Lower Hudson	Blanding's turtle	EC	Prepare expedited pre-assessment document to determine whether Harbor at Hastings NPL Site poses threats to trust resources and opportunity exists for NRDA assessment work.



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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
EC-16	Lower Hudson	Blanding's turtle	EC	Prepare expedited pre-assessment document to determine whether Hertel landfill (NPL Site) poses threats to trust resources and opportunity exists for NRDA assessment work.
EC-17	St. Lawrence	Bobolink	EC	Consider bobolink restoration projects in settlement negotiations regarding St. Lawrence NRDA.
EC-18	Upper Susquehanna	Brook trout	EC	When possible, use NRDAR restoration funds to restore and protect vernal pools. Consider brook trout when evaluating restoration projects for Richardson Hill NRDA case.
EC-19	Allegheny, Finger Lakes/Onondaga, Great Lakes	Cerulean warbler	EC	Evaluate international options for NRDAR restoration projects when opportunity arises.
EC-20	Allegheny, Finger Lakes/Onondaga, Great Lakes	Cerulean warbler	EC	Include cerulean warblers in contaminants analysis for NRDAR and other projects.
EC-21	Great Lakes, St. Lawrence	Common tern	EC	Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats.
EC-22	Great Lakes, St. Lawrence	Common tern	EC	Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats.
EC-23	Great Lakes, St. Lawrence	Common tern	EC	Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources.
EC-24	Great Lakes	Common tern	EC	Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea (of the Buffalo/Niagara Rivers NRDA case).
EC-25	St. Lawrence	Common tern	EC	Manage St. Lawrence River Environment case; consider restoration projects that benefit common tern.
EC-26	Allegheny, St. Lawrence	Golden-winged warbler	EC	Evaluate potential NRDAR cases (such as Sinclair Refinery (Allegheny) and St. Lawrence Environment (St. Lawrence) that may provide opportunity for scrub-shrub and golden-winged warbler habitat restoration.
EC-27	Finger Lakes/Onondaga	Indiana bat	EC	Prepare 2009 bat mercury NRDAR report for Onondaga Lake.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
EC-28	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	EC	White Nose Syndrome research- send all samples out for analysis.
EC-29	Upper Susquehanna	Jefferson's salamander	EC	Coordinate Kentucky Avenue Wellfield BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
EC-30	Upper Susquehanna	Jefferson's salamander	EC	Prepare expedited preassessment document to determine whether Kentucky Avenue Wellfield NPL Site poses threats to trust resources and opportunity exists for NRDA assessment work.
EC-31	Upper Susquehanna	Jefferson's salamander	EC	When possible, use NRDAR restoration funds to restore and protect vernal pools; consider Jefferson/Blue spotted salamanders when evaluating restoration projects for Richardson Hill NRDA case.
EC-32	Great Lakes	Lake sturgeon	EC	Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats.
EC-33	Great Lakes	Lake sturgeon	EC	Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources.
EC-34	Great Lakes	Lake sturgeon	EC	Evaluate emerging contaminants in Rochester Embayment Area of Concern.
EC-35	Great Lakes	Lake sturgeon	EC	Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea (of the Buffalo/Niagara Rivers NRDA case).
EC-36	St. Lawrence	Lake sturgeon	EC	Manage St. Lawrence NRDA River case; consider lake sturgeon restoration projects in settlement negotiations regarding the case.
EC-37	Finger Lakes/ Onondaga	Lake sturgeon	EC	Work with NYSDEC, to begin to identify opportunities for the placement of spawning substrate beds in Nine Mile Creek and Onondaga Creek as a NRDA restoration opportunity.
EC-38	St. Lawrence	Northern pike	EC	Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment Area of Concern to determine potential impacts to fish and wildlife Trust resources and their supporting habitats, with potential for including the St. Lawrence Area of Concern in subsequent years.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
EC-39	St. Lawrence	Northern pike	EC	Coordinate with USEPA and Area of Concern Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources.
EC-40	St. Lawrence	Northern pike	EC	Manage St. Lawrence NRDA River case; consider northern pike restoration projects in settlement negotiations regarding the case.
EC-41	Long Island	Winter flounder	EC	Coordinate Gowanus Canal BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
EC-42	Long Island	Eastern tiger salamander	EC	Investigate development of an On-/Off-Refuge research proposal to address impact of contaminants on this and/or other herpetile species and seek funding for such work.
EC-43	Great Lakes	Bald eagle	EC	Investigate development of an On-/Off-Refuge research proposal to address impact of contaminants on osprey and/or other avian species and seeking funding for such work.
EC-44	Upper Hudson River	Brook trout	EC	Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment; review fish data and assess status of fish injury; if possible, use NRDA restoration funds to restore and protect streams identified.
EC-45	Great Lakes	American woodcock	EC	Conduct restoration planning and implementation for the Hi View Terrace NRD settlement
EC-46	Lower Hudson	American eel	EC & CPA	Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat.
EC-47	Great Lakes	Broad-winged hawk	EC & CPA	Seek to influence regulatory agency decisions; seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured. Seek to minimize use of pesticides in new developments to ensure viable populations of amphibian prey; minimized use of pesticides to control mosquitoes; sprays will also impact larger insects which are an important prey item for broad-wings.
EC-48	Great Lakes	Brook trout	EC & CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout.
EC-49	Finger Lakes/ Onondaga	Chittenango ovate amber snail	EC & ESA & CPA	Provide input into State and Federally-permitted activities which involve Chittenango Creek, upstream of the Falls as well as other permitted activities that may impact water quality in the Creek.
ESA-1	Finger Lakes/ Onondaga	American hart's-tongue fern	ESA	Coordinate with NYSOPRHP regarding their planned invasive species management.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-2	Finger Lakes/ Onondaga	American hart's- tongue fern	ESA	Provide annual RDC information to Region 4 as requested.
ESA-3	Lower Hudson, St. Lawrence, Upper Hudson	Blanding's turtle	ESA	Attend and provide input at NYSDEC Recovery Plan meetings, as requested. Assist DEC with development of BMPs, threats assessment, and mitigation strategies, as requested.
ESA-4	Lower Hudson, St. Lawrence, Upper Hudson	Blanding's turtle	ESA	Coordinate with the NYSDEC to determine survey schedule. For St. Lawrence focal area coordinate additionally with Glen Johnson (SUNY Potsdam).
ESA-5	Lower Hudson, St. Lawrence, Upper Hudson	Blanding's turtle	ESA	Provide Service support for 2011 multi-state State Wildlife Grant Blanding's turtle proposal submission, with a priority given to the population genetics research, as requested.
ESA-6	Lower Hudson	Bog turtle	ESA	Assist with health assessment with Wildlife Conservation Society: assist with field collection of samples; provide grant oversight.
ESA-7	Lower Hudson	Bog turtle	ESA	Conduct proactive surveys to locate additional populations: complete grant agreement for contractor (Tesauro); manage grant agreement; apply for additional funding.
ESA-8	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Consult with Dr. Rosenbaum and NYSDEC to identify priority sites for invasive plant control.
ESA-9	Lower Hudson	Bog turtle	ESA	Coordinate with PAFO, NJFO, NEFO and partners on goal for NY for HHRU subunits.
ESA-10	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Determine goal, with PAFO, for NY/PA for Prairie Peninsula/Lake Plain Recovery Unit.
ESA-11	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Develop a PPLPRU recovery implementation plan by August 1, 2011.
ESA-12	Lower Hudson	Bog turtle	ESA	Hold initial call/meeting to reinvigorate Hudson/Housatonic team.
ESA-13	Lower Hudson	Bog turtle	ESA	Complete 1-3 year implementation plan for Hudson, Housatonic, and Wallkill recovery subunits by August 1, 2011.
ESA-14	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Initiate Prairie Peninsula/Lake Plain Recovery Unit implementation team.
ESA-15	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Manage grant agreement for SUNY Oswego 2010 GLRI Phase 1 survey project.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-16	Lower Hudson	Bog turtle	ESA	Meet with ESF to learn more about developing population estimates for Perry Preserve.
ESA-17	Lower Hudson	Bog turtle	ESA	Meet with NRCS on status of WRP projects and plans.
ESA-18	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Provide assistance to Regional Coordinator for development of 5-year review.
ESA-19	Finger Lakes/ Onondaga, Great Lakes	Bog turtle	ESA	Provide technical assistance to SUNY Oswego to develop follow-up proposal for Phase 2 surveys for GLRI grant.
ESA-20	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	Bog turtle	ESA	Utilize materials on pipelines from NiSource HCP to develop pipeline factsheet.
ESA-21	Finger Lakes/ Onondaga	Chittenango ovate amber snail	ESA	Complete 5-year review.
ESA-22	Finger Lakes/ Onondaga	Chittenango ovate amber snail	ESA	Pursue final results of captive methodology development from USGS.
ESA-23	Finger Lakes/ Onondaga	Chittenango ovate amber snail	ESA	Pursue final results of genetics research from USGS; invite USGS to captive management workshop.
ESA-24	Finger Lakes/ Onondaga	Chittenango ovate amber snail	ESA	Apply for Preventing Extinction grant; conduct a workshop to determine the feasibility of ex situ conservation and craft a captive rearing plan; determine interested facilities; complete necessary contracts or cooperative agreements.
ESA-25	Finger Lakes/ Onondaga	Chittenango ovate amber snail	ESA	For summer 2010 surveys: enter data into Excel; enter data into Program MARK; using survey results and other pertinent data, conduct a population viability assessment for Chittenango ovate amber snail.
ESA-26	Lower Hudson	Dwarf wedgemussel	ESA	Assist with development of measures for NiSource HCP.
ESA-27	Lower Hudson	Dwarf wedgemussel	ESA	Develop conservation framework, including standard conservation measures, for bridge projects.
ESA-28	Lower Hudson	Dwarf wedgemussel	ESA	Obtain final USGS E. Branch Delaware River Report.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-29	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Provide technical assistance pertaining to State recovery plan.
ESA-30	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Coordinate with the Regional Office, Pennsylvania Field Office and other ES Field offices for the states of Maryland, Virginia, West Virginia regarding hellbender conservation efforts to tie-in with greater FWS strategic habitat planning.
ESA-31	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Assist DEC with creating priority site map.
ESA-32	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Assist DEC with developing a database repository.
ESA-33	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Develop decontamination protocol to counter disease ( <i>B.d.</i> ).
ESA-34	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Develop standardized data collection sheets for surveys.
ESA-35	Allegheny	Eastern hellbender	ESA	Provide any technical assistance needed to NYSDEC and Buffalo Zoo on captive propagation program.
ESA-36	Upper Susquehanna	Eastern hellbender	ESA	Provide any technical assistance needed to NYSDEC, ESF and USC regarding Susquehanna headstarting plan.
ESA-37	Allegheny	Eastern hellbender	ESA	Provide technical assistance when NYSDEC is prepared for first release of captive propagated individuals.
ESA-38	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Provide technical assistance with FWS status assessment (work being done by Columbus Field Office – Jeromy Applegate).
ESA-39	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Research what types of funding sources exist in order to conduct surveys, enhance hellbender habitat, captively raise hellbenders, etc.
ESA-40	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Assist DEC with surveys of historic and new sites to estimate current population sizes.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-41	Allegheny, Upper Susquehanna	Eastern hellbender	ESA	Work with Buffalo State College on 2011 Hellbender Symposium.
ESA-42	Great Lakes	Houghton's goldenrod	ESA	Coordinate with the FWS ELFO and species lead with regard to the current 5-year review.
ESA-43	Great Lakes	Houghton's goldenrod	ESA	Establish an open access research permit with the Bergen Swamp Preservation Society.
ESA-44	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Assist FWS Region 3 with finalizing Recovery Plan as requested.
ESA-45	St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Assist NYSDEC with "Ibat on year" winter 2010-2011 surveys; for St. Lawrence focal area: Glen Park.
ESA-46	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Assist with captive bat management structured decision making process.
ESA-47	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Assist with development of measures for NiSource HCP .
ESA-48	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Assist with Ibat modeling SDM effort until completion: respond to data requests from USGS and R3; participate in calls during Beta testing; attend workshop to test model; assist with roll-out of model; provide TA to FOs with use of model.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-49	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Continue to rotate current Indiana bat/WNS display at nature center, updating display at least once each year.
ESA-50	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Develop conservation framework, including standard conservation measures, for residential and commercial projects.
ESA-51	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Indiana bat	ESA	Complete St. Lawrence Wind consultation.
ESA-52	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Develop standardized approaches to evaluating wind projects and developing conservation measures: participate in multi-region project to develop guidance; participate in multi-region calls.
ESA-53	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence,	Indiana bat	ESA	Develop standardized protocols for use of bat detection systems to survey for Indiana bats: participate in Regional WNS funding discussions and promote funding of acoustic automation system; participate in team to revise Indiana bat survey protocols as requested; conduct 1 acoustic transect route 2-3 nights.
ESA-54	Lower Hudson, Upper Hudson	Indiana bat	ESA	Develop standardized protocols for use of bat detection systems to survey for Indiana bats: participate in Regional WNS funding discussions and promote funding automation of acoustic survey data analysis by FY10 Congressional pot; participate in Ibat/Wind Initiative protocol team as requested.
ESA-55	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Indiana bat	ESA	Fort Drum Army Compatible Use Buffer program: participate in meetings/calls to target Ibat lands; provide technical assistance to Fort Drum with easement language; complete consultation on ACUB program.



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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-56	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Indiana bat	ESA	Fort Drum: Participate in semi-annual Natural Resources Branch Meetings, attending at least one in person and one over the phone; send recognition letter to Army; assist with summer transmission study by assisting with capture and processing of bats at condo 1-3 nights.
ESA-57	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	New Indiana bat display: Provide technical assistance to the USFS in the development of a new display; receive transfer funding from USFS and develop contracts to complete display.
ESA-58	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Indiana bat	ESA	Participate in consultation with Fort Drum.
ESA-59	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Participate in R5 planning team to develop standardized roles/responsibilities for species leads.
ESA-60	Lower Hudson, Upper Hudson	Indiana bat	ESA	Review annual reports from Adams Fairacre Farms (FY11,12, NYFO ES)
ESA-61	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Indiana bat	ESA	Review annual reports from Fort Drum and Fort Drum Connector.
ESA-62	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Review NYSDEC permit conditions.
ESA-63	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	Indiana bat	ESA	Coordination Regional review of Indiana bat permit.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-64	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	Update Indiana bat fact sheets and web materials.
ESA-65	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	White Nose Syndrome (WNS)-related research: Assist with RFPs as requested; review proposals if requested to be on review team; provide grant oversight for FY08 and FY09 projects; assist with field work.
ESA-66	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	Indiana bat	ESA	WNS National Plan: provide technical assistance during FWS and/or public review periods; participate in Communications Group.
ESA-67	Upper Hudson	Karner blue butterfly	ESA	Albany Landfill consultation: Monitor BO implementation.
ESA-68	Upper Hudson	Karner blue butterfly	ESA	Assist FWS Region 3 with review/comments for 5-year review.
ESA-69	Upper Hudson	Karner blue butterfly	ESA	Attend 1 KBB work day with TNC or APBPC.
ESA-70	Upper Hudson	Karner blue butterfly	ESA	Collect lupine/nectar seed.
ESA-71	Upper Hudson	Karner blue butterfly	ESA	Complete consultation for Beaver Pond residential development.
ESA-72	Upper Hudson	Karner blue butterfly	ESA	Complete grant agreement with APBPC for 2011 captive rearing, augmentation efforts; manage two grant agreements with APBPC: visit translocation sites, review reports and invoices.
ESA-73	Upper Hudson	Karner blue butterfly	ESA	Conduct site visits and document completed projects for two LE enforcement cases/settlement.
ESA-74	Upper Hudson	Karner blue butterfly	ESA	Meet with NYSDEC on annual basis to review work conducted under their 10(a)(1)(A) permit.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-75	Upper Hudson	Karner blue butterfly	ESA	Multi-year Spencer Christmas Tree Farm office project: assist with additional clearing.
ESA-76	Upper Hudson	Karner blue butterfly	ESA	National Grid HCP: release for public comment; complete permit decision.
ESA-77	Upper Hudson	Karner blue butterfly	ESA	Participate in process of developing a State recovery plan as needed/requested.
ESA-78	Upper Hudson	Karner blue butterfly	ESA	Participate in twice yearly KBB team calls.
ESA-79	Upper Hudson	Karner blue butterfly	ESA	Provide technical assistance to partners for grant development; NYSDEC project: complete grant agreement paperwork; provide grant oversight.
ESA-80	Upper Hudson	Karner blue butterfly	ESA	Saratoga County Airport consultations: Monitor BO implementation.
ESA-81	Upper Hudson	Karner blue butterfly	ESA	Work with APBPC/TNC to showcase SHA and make a push for landowner sign-ups.
ESA-82	Finger Lakes/ Onondaga	Leedy's roseroot	ESA	Obtain 2010 data from Heritage Program.
ESA-83	Finger Lakes/ Onondaga, Great Lakes	Massasauga rattlesnake	ESA	Grant oversight (NYSDEC GLRI 2010 proposal).
ESA-84	Finger Lakes/ Onondaga, Great Lakes	Massasauga rattlesnake	ESA	Respond to Candidate Notice of Review to FWS Region 3.
ESA-85	Lower Hudson, Upper Hudson	New England cottontail	ESA	Assist NYSDEC with pellet collection.
ESA-86	Lower Hudson, Upper Hudson	New England cottontail	ESA	Co-host landowner outreach meeting with NRCS.
ESA-87	Lower Hudson, Upper Hudson	New England cottontail	ESA	Develop New York conservation goals using predictive modeling from SWG project as starting point.
ESA-88	Lower Hudson, Upper Hudson	New England cottontail	ESA	New York efforts: assist with development/review of focus area maps; develop goals for New York populations.
ESA-89	Lower Hudson, Upper Hudson	New England cottontail	ESA	Rangewide efforts: participate in monthly calls; participate in steering committee calls/meetings; assist with development of rangewide conservation strategy; review products from SWG grant.
ESA-90	Upper Susquehanna	Northeastern bulrush	ESA	Assess the impact of threats (e.g., herbivory, hydrology) at the known population and evaluation possible management techniques, if needed.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-91	Upper Susquehanna	Northeastern bulrush	ESA	Conduct an initial count at the known population in order to determine population size and reproductive effort and conduct these counts every five years in order to understand these factors over time and population viability.
ESA-92	Upper Susquehanna	Northeastern bulrush	ESA	Contact the landowner of the single northeastern bulrush site in New York State for initial conversations about conservation.
ESA-93	Upper Susquehanna	Northeastern bulrush	ESA	Submit funding proposal for NY Natural Heritage Program to survey for additional populations.
ESA-94	Upper Susquehanna	Northeastern bulrush	ESA	Conduct training for U.S. Army Corps of Engineers in identifying potential habitat and the plant.
ESA-95	Upper Susquehanna	Northeastern bulrush	ESA	Develop fact sheet for this species.
ESA-96	Lower Hudson	Northern wild monkshood	ESA	Provide information to FWS Region 3 for annual RDC.
ESA-97	Great Lakes	Piping plover	ESA	Assist with 2011 International Census; coordinate NYFO involvement.
ESA-98	Great Lakes	Piping plover	ESA	Provide sighting information to Region 3 for annual RDC.
ESA-99	Allegheny	Rayed bean	ESA	Review proposed rule to list rayed bean as endangered.
ESA-100	Allegheny	Rayed bean	ESA	Conduct outreach to NY interested parties for proposed rule to list rayed bean as endangered.
ESA-101	Allegheny	Rayed bean	ESA	Map known mussel populations.
ESA-102	Lower Hudson	Small whorled pogonia	ESA	Apply for Showing Success grant for surveys.
ESA-103	Lower Hudson	Small whorled pogonia	ESA	Assist with surveys of the known population in order to determine population size and reproductive effort over three years and assess population viability.
ESA-104	Lower Hudson	Small whorled pogonia	ESA	Coordinate with NYSOPRHP with regard to the location of recreation developments near small whorled pogonia.
ESA-105	Lower Hudson	Small whorled pogonia	ESA	Participate in a NYS small whorled pogonia working group with species partners in order to coordinate efforts and resources.
ESA-106	St. Lawrence, Lower Hudson	American eel	ESA & CPA	Address status assessment and listing proposal.
ESA-107	Lower Hudson	Bog turtle	ESA & CPA	Recommend surveys for this species during project reviews.
ESA-108	Finger Lakes/ Onondaga, Great Lakes	Massasauga rattlesnake	ESA & CPA	Provide substantive comments on proposed actions with potential impacts on this species.
ESA-109	Great Lakes	Piping plover	ESA & CPA	Request surveys for this species prior to work done in critical habitat areas.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
ESA-110	Finger Lakes/ Onondaga	Chittenango ovate amber snail	ESA & CPA & EC	Provide input into State and Federally-permitted activities which involve Chittenango Creek, upstream of the Falls as well as other permitted activities that may impact water quality in the Creek.
ESA-111	Allegheny, Upper Susquehanna	Eastern hellbender	ESA & IT	Develop a website for hellbender or link to existing websites for outreach and contractors.
ESA-112	Lower Hudson, Upper Hudson	New England cottontail	ESA & IT	Update website with NEC information and ongoing projects.
ESA-113	Upper Susquehanna	Northeastern bulrush	ESA & IT	Construct a northeastern bulrush web page for the NYFO site linking information resources from PAFO.
ESA-114	Lower Hudson	Small whorled pogonia	ESA & IT	Construct small whorled pogonia web page for the NYFO site, linking to NEFO as needed.
ESA-115	Upper Hudson	Karner blue butterfly	ESA & IT & PFW	Update our website with recent projects like Spencer.
ESA-116	Lower Hudson	Bog turtle	ESA & PFW	Continue habitat restoration projects in focused areas: meet with NRCS, TNC, and NYSDEC to determine how FWS can best assist; provide technical assistance to NRCS as requested; assist with habitat restoration projects as NRCS WRP cost-share or Partners stand-alone projects; fund Jason Tesauro to continue landowner outreach, surveys, development of site plans, and monitoring. 1 project confirmed; 2 more in planning.
ESA-117	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	Bog turtle	ESA & PFW	Participate in Rangewide Bog Turtle Initiative: participate in conference calls; assist Alison Whitlock in planning and convening next workshop.
ESA-118	Great Lakes	Bog turtle	ESA & PFW	Westbury bog: Develop a restoration plan; implementation contingent on landowner approval.
ESA-119	Lower Hudson, Upper Hudson	New England cottontail	ESA & PFW	Participate in NRCS NEC Restoration Initiative, including: participate in initial conference calls; assist NRCS with ranking criteria for FY2011 WHIP and in signing up landowners for FY2011 WHIP; provide technical assistance to NRCS for development of outreach products as needed; attend NRCS public/landowner information sessions if applicable; convene meeting (Millbrook) with partner agencies to (1) sign them up into WHIP if possible and (2) develop landowner outreach strategy to sign additional landowners into the program to meet NRCS FY2011 goals (40 acres). PFW to deliver identified projects, funding dependent.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
FEMRF-1	St. Lawrence	American eel	FEMRF	Facilitate habitat preservation through coordination with land trusts (Thousand Islands Land Trust).
FEMRF-2	St. Lawrence	American eel	FEMRF	Via FEMRF funding, continue research determined necessary by the USFWS to support upstream and downstream passage of eel at the St. Lawrence-FDR Power Project.
FEMRF-3	St. Lawrence	Lake sturgeon	FEMRF	Assist NYSDEC and USGS with surveys to determine current population levels of lake sturgeon and determine presence/absence of the species.
FEMRF-4	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Lake sturgeon	FEMRF	Assist NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation.
FEMRF-5	Great Lakes, St. Lawrence	Lake sturgeon	FEMRF	Assist NYSDEC with 5-year population assessments through providing field assistance and PIT tagging supplies.
FEMRF-6	Great Lakes, St. Lawrence	Lake sturgeon	FEMRF	Develop NYFO FEMRF GIS Decision Support Tool to focus preservation efforts.
FEMRF-7	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Lake sturgeon	FEMRF	Facilitate the writing of a New York State Lake Sturgeon Management Plan.
FEMRF-8	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	Lake sturgeon	FEMRF	Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range.
FEMRF-9	St. Lawrence	Lake sturgeon	FEMRF	Host NYS Lake Sturgeon Working Group meeting.
FEMRF-10	St. Lawrence	American eel	FEMRF & CPA	Attend annual IEPG to address overfishing issues.
FEMRF-11	St. Lawrence	American eel	FEMRF & CPA	Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts; draft plan has been completed to address downstream passage in the St. Lawrence.
FEMRF-12	St. Lawrence	American eel	FEMRF & CPA	Hold at least two FEMRF Eel Study Group meetings annually to further efforts towards proposed approach to address turbine mortality ; the Eel Study Group will review FEMRF eel project proposals.
FEMRF-13	St. Lawrence	American eel	FEMRF & CPA	Hold at least two Fisheries Advisory Council meetings annually to discuss FEMRF proposals.

## Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
FEMRF-14	St. Lawrence	American eel	FEMRF & CPA	Lead International Eel Passage Group meetings; develop and seek funding approaches to address turbine mortality through trap/transport alternatives to foster international support.
FEMRF-15	St. Lawrence	Northern pike	FEMRF & CPA	Attend meetings with other organization/agencies to gain insight into their efforts towards northern pike habitat restoration (e.g. American Fisheries Society).
FEMRF-16	St. Lawrence	Northern pike	FEMRF & CPA	Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan.
FEMRF-17	St. Lawrence	Northern pike	FEMRF & CPA	Provide substantive comments on the following projects with the conservation of northern pike and their recovery as one of our foci: Massena Electric Development, Eel Weir Dam, Heuvelton Dam.
FEMRF-18	St. Lawrence	Northern pike	FEMRF & CPA	Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g. U.S. Army Corps of Engineers 404 permits, FERC relicensing, and license compliance work).
FEMRF-19	St. Lawrence	American black duck	FEMRF & PFW	Restore 60 acres of grassland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
FEMRF-20	St. Lawrence	American black duck	FEMRF & PFW	Restore 60 acres of wetland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
FEMRF-21	St. Lawrence	American eel	FEMRF & PFW	Identify and prioritize streams for eel passage, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan: Evaluate three tributaries per year for fish barriers (for FY2011 tributaries are: Barretts, Mullett, Brandy) and develop plans for barrier mitigation to be submitted to the FAC); look at fish barrier mitigation on Oswegatchie River through relicensing process at two locations; investigate opportunity to reopen FERC license at Ogdensburg to require upstream and downstream fish passage.
FEMRF-22	St. Lawrence	Lake sturgeon	FEMRF & PFW	Work with NYSDEC to identify locations to place spawning substrate beds in tributaries to the St. Lawrence River.
FEMRF-23	Great Lakes	Lake sturgeon	FEMRF & PFW	Work with NYSDEC to begin to identify opportunities for the placement of spawning substrate beds in tributaries to Lake Ontario.
FEMRF-24	St. Lawrence	Northern pike	FEMRF & PFW	Assist landowners in identifying suitable habitat on their properties, threats to those habitats, and references for technical assistance in implementing habitat improvement projects.
FEMRF-25	St. Lawrence	Northern pike	FEMRF & PFW	Continue FEMRF efforts towards pursuing and funding sound proposals that would contribute to northern pike recovery.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
FEMRF-26	St. Lawrence	Northern pike	FEMRF & PFW	Continue Fish Barrier Assessment & Mitigation project: mitigate significant barriers; work to obtain funding for Stream Habitat Survey/Fish Response project. FY2011 work on three stream systems: Barretts, Mullett, Brandy.
FEMRF-27	St. Lawrence	Northern pike	FEMRF & PFW	Initiate Stream Habitat Survey/Fish Response project proposal; working in conjunction with Fish Barrier Assessment & Mitigation project.
FEMRF-28	St. Lawrence	Northern pike	FEMRF & PFW	Participate in Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership.
FEMRF-29	St. Lawrence	Northern pike	FEMRF & PFW	Work with FEMRF funded contractors to determine marshes with highest potential.
FEMRF-30	St. Lawrence	American eel	FEMRF & PFW & CPA	Coordinate with developing Great Lakes Landscape Conservation Cooperative and Great Lakes Fish Habitat Partnership.
IT-1	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	American black duck	IT	Post fact sheets/BMPs for this species on our website.
IT-2	Great Lakes, Upper Susquehanna, St. Lawrence, Upper Hudson	American woodcock	IT	Put Landowners Guide to Woodcock Management up on NYFO web site.
IT-3	Great Lakes, St. Lawrence	Bobolink	IT	Create map for possible bobolink sites of concern.
IT-4	Great Lakes, St. Lawrence	Bobolink	IT	NY Audubon is involved in bobolink conservation and may have data layers we can use; check studies by Cornell – in vicinity of Madison Co. NRCS has shape files for priority areas for CRP and WHP.
IT-5	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	Bog turtle	IT	Post BMPs for pipelines on website.
IT-6	Great Lakes, St. Lawrence	Common tern	IT	Create map or shapefile of existing and potential common tern breeding and foraging areas for all NYFO programs.
IT-7	Upper Susquehanna	American shad	IT & CPA	Distribute BMP information on our website.
IT-8	Great Lakes, St. Lawrence	Bobolink	IT & CPA & PFW	Analyze existing areas of habitat to determine potential breeding areas; analyze breeding bird survey data to focus efforts.



Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
IT-9	Lower Hudson, Upper Hudson	New England cottontail	IT & ES	Update website with NEC information and ongoing projects.
IT-10	Upper Susquehanna	Northeastern bulrush	IT & ES	Construct a northeastern bulrush web page for the NYFO site linking information resources from PAFO.
IT-11	Lower Hudson	Small whorled pogonia	IT & ES	Construct small whorled pogonia web page for the NYFO site, linking to NEFO as needed.
IT-12	Finger Lakes/ Onondaga	American black duck	IT & PFW	Locate high quality migratory stopover habitat in the watershed utilizing GIS tools.
IT-13	Upper Hudson	Karner blue butterfly	IT & PFW & ES	Update our website with recent projects like Spencer.
LIFO-1	Long Island	Piping plover	LIFO	As needed, work with Valley Stream office of LE to investigation alleged endangered species take incidents. Develop a work plan for a seasonal intern to undertake piping plover monitoring at Southampton and Huntington, NY in support of LE activities (contingent on funding).
LIFO-2	Long Island	Piping plover	LIFO	Assess feasibility of a plan regarding feral cats on Cedar Beach Mount Sinai and other breeding sites within the Town of Brookhaven. Continue to participate in national teleconferences to develop USFWS guidance on feral cats; On Long Island obtain and gather information on feral cat colony locations; do outreach to local government to advise them about removal of colonies.
LIFO-3	Long Island	Piping plover	LIFO	Complete any intraservice consultations on removal of predators in breeding habitat.
LIFO-4	Long Island	Piping plover	LIFO	Provide cooperators piping plover equipment such as signs, predator exclosures, fencing and string for identified priority sites (as funding allows).
LIFO-5	Long Island	Piping plover	LIFO	Continue to lead ES efforts on review of GSA DEIS regarding the proposed disposition of Plum island animal research lab.
LIFO-6	Long Island	Piping plover	LIFO	Implement monitoring and management of piping plovers at select sites such as Sand City, Crab Meadow Beach, Breezy Point, West Hampton, Plum Island, Fishers Island, Centre Island, and Silver Point, between April 1 and September 1. Depending on availability and need, assist Long Island's east end towns with monitoring and management. This effort also includes cross-programmatic efforts with LINWR and FWS LE, coordination with cooperators, providing technical assistance, funding and supplies, and when available, outside funding from the Corps to hire a plover monitor for the Federal FI Inlet Navigation Project Area.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
LIFO-7	Long Island	Piping plover	LIFO	As follow up to existing section 7 consultations with the National Park Service and Suffolk County Department of Parks, Recreation and Conservation, determine compliance with project commitments to undertake habitat restoration at Cupsogue County Park and Smith Point County Park.
LIFO-8	Long Island	Piping plover	LIFO	Conduct Long Island Colonial Waterbird and Piping Plover Surveys at Sand City, Centre Island, Tobay Marsh Islands, Silver Point, Crab Meadow Beach, Breezy Point, Fishers Island, and Plum Island. Assess piping plover use of mainland upland sand dredging disposal sites located at Roe and Grove Avenue in Patchogue by conducting periodic surveys.
LIFO-9	Long Island	Piping plover	LIFO	Hold two steward training sessions and work with LE to assess need for special training for LE agents from cooperating land managers.
LIFO-10	Long Island	Piping plover	LIFO	On a case by case basis, assess impacts of Corps and local government projects on coastal processes through section 7 consultation and section 10 permit review.
LIFO-11	Long Island	Piping plover	LIFO	Meet with Fire Island National Seashore Natural Resource Management to review results of 2010 , and plan for 2011, threatened and endangered species monitoring and protection efforts within the Seashore.
LIFO-12	Long Island	Piping plover	LIFO	Provide technical assistance on appropriate conservation measures e.g. TOY restrictions to avoid and minimize adverse effects relative to Corps of Engineers and Coast Guard permit, planning and operations decisions.
LIFO-13	Long Island	Piping plover	LIFO	As requested, undertake section 7 consultation with FEMA for emergency disaster declaration projects.
LIFO-14	Long Island	Piping plover	LIFO	Work with NYSOPRHP on a conservation strategy to address long term conflicts between recreational uses of barrier beaches and listed species habitat protection and avoidance of adverse effects/take; meet with NYSOPRHP; meet with RO and HCP experts; convene a workshop re. HCP process.
LIFO-15	Long Island	Red knot	LIFO	Coordinate with Federal, state, and local regulatory and land use agencies on measures that could minimize impacts to horseshoe crab and red knot habitat, including the Plumb Beach Shoreline Protection Project.
LIFO-16	Long Island	Roseate tern	LIFO	Continue to fund AMNH Great Gull monitoring and management of common tern and roseate tern colony at Great Gull.
LIFO-17	Long Island	Roseate tern	LIFO	Continue to support Town of Brookhaven project at New Made Island with installation and broadcasting breeding calls to attract roseate and common terns.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
LIFO-18	Long Island	Roseate tern	LIFO	If needed, assist in funding predator control on Great Gull Island.
LIFO-19	Long Island	Roseate tern	LIFO	In cooperation with NWR, plan vegetation removal maintenance at New Made Island.
LIFO-20	Long Island	Roseate tern	LIFO	Participate in ROTE recovery meeting in RI end of November.
LIFO-21	Long Island	Roseate tern	LIFO	Provide technical assistance to Breezy Point Coop, and other sites as needed, for common, least and ROTE nesting habitat protection.
LIFO-22	Long Island	Saltmarsh sharp-tailed sparrow	LIFO	In 2010, convene a teleconference with University of Maine to identify survey protocols for saltmarsh sharp-tailed sparrows that will be incorporated into a Long Island census of sparrow populations at the following sites: Gardiner County Park, Long Cove FIIS, NYSDEC Fireplace Neck wetlands, TNC Pine Neck Marsh and Wading River Marsh, Town of Hempstead Oceanside Marine Sanctuary and North Cinder Island, and NYC Department of Parks wetlands near JFK and Jamaica Bay. .
LIFO-23	Long Island	Saltmarsh sharp-tailed sparrow	LIFO	In 2010, initiate a status assessment for saltmarsh sharp-tailed sparrow. Coordinate one meeting of interested parties to discuss population objectives and sampling methodology for saltmarsh sharp-tailed sparrows on Long Island.
LIFO-24	Long Island	Saltmarsh sharp-tailed sparrow	LIFO	Participate in the annual two day survey of USGS Breeding Bird Survey routes (Hauppauge and Huntington routes).
LIFO-25	Long Island	Saltmarsh sharp-tailed sparrow	LIFO	Determine the feasibility of developing a monitoring network, similar to the Long Island Colonial Waterbird and Piping Plover survey program, that could undertake coordinated sampling for this and other species, by hold a meeting with the NYSDEC and other principal partners.
LIFO-26	Long Island	Sandplain gerardia	LIFO	Assist TNC and LINWR in managing suitable habitat in Sayville and TNC properties.
LIFO-27	Long Island	Sandplain gerardia	LIFO	Meet with Service personnel at FWS Region 5 Biologist Conference (Feb. 2011) to agree upon a strategy to address <i>A. acuta</i> taxon now being <i>A. decemloba</i> and the associated de-listing and possible re-listing. In coordination with FWS Raleigh North Carolina Field Office, initiate efforts to determine <i>A. decemloba</i> range/distribution/abundance in southern states. Identify stakeholders and assign tasks.
LIFO-28	Long Island	Seabeach amaranth	LIFO	Conduct species surveys at Breezy Point, Westhampton Dunes. Assist in surveys throughout Long Island as needed.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
LIFO-29	Long Island	Seabeach amaranth	LIFO	Establish symbolic fencing; actively manage & protect habitat for plovers and seabeach amaranth at Breezy Point Co-op and Village of Westhampton Dunes, and provide recommendations to land managers regarding protection of amaranth along the south shore of Long Island. Assist in installation of symbolic fencing as needed.
LIFO-30	Long Island	Seabeach amaranth	LIFO	Maintain Long Island-wide database on species abundance and convey to Dale Souter, Wendy Walsh.
LIFO-31	Long Island	Winter flounder	LIFO	Consult with U.S. Army Corps of Engineers/federal action agencies that authorize, fund or undertake actions (power plants, tidal power projects) which could entrain/impinge winter flounder and provide recommendations/conservation measures to avoid/minimize or compensate for these impacts.
LIFO-32	Long Island	Winter flounder	LIFO	When reviewing Section 10/404 permit applications, recommend conservation measures that avoid, minimize or compensate for impacts associated with channeling and/or bulkheading of nearshore habitats.
LIFO-33	Long Island	Winter flounder	LIFO	When reviewing Section 10/404 permit applications, recommend time of year restrictions so that dredging activities which increase suspended sediment concentrations, do not occur during winter flounder spawning (generally October-March, coordinate with NYSDEC to confirm).
LIFO-34	Long Island	Winter flounder	LIFO	When reviewing Section 10/404 permit applications, recommend use of non-toxic materials for in-water structures such as bulkheads, piers, pilings and boat lifts.
PFW-1	Finger Lakes/ Onondaga	American black duck	PFW	Identify additional restoration opportunities in Owasco Inlet and Owasco Lake.
PFW-2	Upper Hudson	American black duck	PFW	Meet with NRCS to assess potential WRP sites in Washington County.
PFW-3	Finger Lakes/ Onondaga	American black duck	PFW	Restore 10 acres of emergent wetlands and associated uplands to benefit black ducks in the Great Lakes watershed (GLRI) which includes the Finger Lakes drainage basin.
PFW-4	Great Lakes	American black duck	PFW	Restore 30 acres of grassland habitat to benefit black ducks in the Great lakes watershed.
PFW-5	Great Lakes	American black duck	PFW	Restore 30 acres of wetland habitat to benefit black ducks in the Great lakes watershed.
PFW-6	Lower Hudson, St. Lawrence	American eel	PFW	Provide technical assistance on stream restoration projects in the watershed, as requested.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
PFW-7	Upper Susquehanna	American shad	PFW	Participate in State technical committee, subcommittee work to provide technical assistance on programs and projects which minimize sediment loads in streams, and which may provide for establishment of buffers.
PFW-8	Upper Susquehanna	American shad	PFW	Provide technical assistance on stream restoration projects in the Upper Susquehanna watershed; continue natural restoration of the Canasawacta (target is 1/4 mile).
PFW-9	Upper Susquehanna	American shad	PFW	Work with partner organizations to prioritize barriers to be targeted for removal.
PFW-10	Great Lakes, Upper Susquehanna	American woodcock	PFW	Complete 100 acres of early successional habitat projects within the Great Lakes and Upper Susquehanna Focal Areas.
PFW-11	Great Lakes, Upper Susquehanna	American woodcock	PFW	Coordinate logistics with NWRS R5 Hydro-Ax.
PFW-12	Great Lakes, Upper Susquehanna, St. Lawrence, Upper Hudson	American woodcock	PFW	Educate landowners during site visits when potential habitat projects are present.
PFW-13	Great Lakes, St. Lawrence	Bobolink	PFW	Restore 50 acres of early successional grassland habitat to benefit bobolink and other birds with similar habitat needs at project site patch size of $\geq 10$ acres.
PFW-14	Upper Hudson	Brook trout	PFW	Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control: Onesquethaw Creek, Kayaderosseras Creek, Battenkill, Upper Hoosic River.
PFW-15	Finger Lakes/ Onondaga	Brook trout	PFW	Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control: Owasco Inlet, Cayuga Inlet (1/2 mile).
PFW-16	Upper Susquehanna	Brook trout	PFW	Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control: Genaganslet, Canasawacta, Wilsey Creek.
PFW-17	Upper Hudson	Brook trout	PFW	Restoration work via natural stream design on 500 feet of the Onesquethaw Creek.
PFW-18	Upper Hudson	Brook trout	PFW	Restoration work via natural stream design on 2,000 feet of the Kayaderosseras Creek.
PFW-19	Upper Hudson	Brook trout	PFW	Restoration work via natural stream design on 1 mile of the Battenkill.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
PFW-20	Upper Hudson	Brook trout	PFW	Restoration work via natural stream design on 1 mile of the upper reaches of the Hoosic River.
PFW-21	Finger Lakes/ Onondaga	Brook trout	PFW	Apply for EBTJV money for the implementation of 0.5 miles of in-stream restoration.
PFW-22	Allegheny, Finger Lakes/Onondaga, Great Lakes, Upper Susquehanna, Upper Hudson	Brook trout	PFW	Conduct a statewide training session for County SWCD staff on natural stream design (March 2011).
PFW-23	Finger Lakes/ Onondaga	Brook trout	PFW	Conduct pilot classroom project – Trout Unlimited’s Trout in the Classroom.
PFW-24	Upper Susquehanna	Brook trout	PFW	Continue restoration work via natural stream design on 0.25 miles Canasawacta Creek.
PFW-25	Finger Lakes/ Onondaga	Brook trout	PFW	Design habitat enhancement projects which provide increased flow, stream shading, pool cover, increased availability of riffle habitat (one project).
PFW-26	Upper Susquehanna	Brook trout	PFW	Guide conservation activities in strategic locations forming buffers to protect the watershed from uncontrolled non point source pollution, in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance.
PFW-27	Upper Susquehanna	Brook trout	PFW	Guide conservation activities in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance.
PFW-28	Allegheny	Brook trout	PFW	Meet with NYSDEC fisheries biologists to provide technical assistance on proposed and ongoing stream restoration/habitat enhancement work.
PFW-29	Finger Lakes/ Onondaga	Brook trout	PFW	Restoration work via natural channel design on Fall Creek (500’).
PFW-30	Great Lakes	Brook trout	PFW	Restoration work via natural stream design on 0.5 miles of Chittenango Creek.
PFW-31	Upper Susquehanna	Brook trout	PFW	Restoration work via natural stream design on 0.5 miles of Geneganslet Creek.
PFW-32	Great Lakes	Brook trout	PFW	Restoration work via natural stream design on 0.5 miles of Sandy Creek.
PFW-33	Great Lakes	Brook trout	PFW	Restoration work via natural stream design on 2, 200 feet of Clear Creek.
PFW-34	Great Lakes	Brook trout	PFW	Restoration work via natural stream design on Salmon River, and tributaries (about 0.5 mile in FY2011).

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
PFW-35	Upper Susquehanna	Brook trout	PFW	Restoration work via natural stream design on Wilsey Creek (1/4 mile).
PFW-36	Great Lakes	Brook trout	PFW	Work with LGLFRO to identify additional projects.
PFW-37	Upper Susquehanna	Brook trout	PFW	Work with NYSDEC, NRCS and Upper Susquehanna Conservation alliance to Identify projects. Priority projects identified for FY2011: Genaganslet (1/4 mile); assess Owego, Butternut, Otselic Creeks.
PFW-38	Upper Hudson	Brook trout	PFW	Work with NYSDEC, NRCS to identify projects for barriers to migration.
PFW-39	Upper Hudson	Brook trout	PFW	Work with NYSDOT Region 1 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage ; design and install culvert baffle systems with NYSDOT Region 1 to bury perched culverts as opportunities present themselves within this DOT region.
PFW-40	Great Lakes	Brook trout	PFW	Work with NYSDOT Region 3, 4 and 5 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage ; design and install culvert baffle systems with NYSDOT Region 3, 4 and 5, bury perched culverts as opportunities present themselves within this DOT region. (1 project confirmed for FY2011; potential for 1 additional project in FY2011.)
PFW-41	Upper Susquehanna	Brook trout	PFW	Work with NYSDOT Region 6 and 9 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage ; design and install culvert baffle systems with NYSDOT Region 6 and 9 to bury perched culverts as opportunities present themselves within these DOT regions. (1 project confirmed for FY2011.)
PFW-42	Allegheny, St. Lawrence	Golden-winged warbler	PFW	Work with NRCS to provide technical assistance to restore acres and habitat utilizing the Wildlife Habitat Incentives Program; contact NRCS to determine ongoing consideration given to GWWA and share resources to date.
PFW-43	St. Lawrence	Lake sturgeon	PFW	Conduct multi-year barrier assessments on 3 tributaries of the St. Lawrence River per year and make recommendations for removal.
PFW-44	St. Lawrence	Lake sturgeon	PFW	Remove up to 3 fish barriers per year. For FY2011: Sucker Brook.
PFW-45	St. Lawrence	Northern pike	PFW	Complete Blind Bay project: using amphibious excavator, construct sinuous channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat; create oxbow like sections of the new channels to encourage carex/juncus species diversity.

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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
PFW-46	St. Lawrence	Northern pike	PFW	Continue work in French Creek marsh to open up mono-typical stand of typha to increased flow/provide access to the marsh by northern pike; for FY2011: 2,320 feet.
PFW-47	St. Lawrence	Northern pike	PFW	Coordinate efforts with other organizations/agencies to address habitat loss due to stabilized water levels which have allowed invasive cattail to form dense, monotypic stands with little habitat value.
PFW-48	St. Lawrence	Northern pike	PFW	Establish storylines and information on Regional and NYFO webpage, detailing projects and information for interested landowners and general public.
PFW-49	St. Lawrence	Northern pike	PFW	Monitor fish barrier removal effectiveness at Little Sucker Brook.
PFW-50	St. Lawrence	Northern pike	PFW	Promote/plan/fund marsh evaluations/public outreach.
PFW-51	St. Lawrence	Northern pike	PFW	Start work on Grindstone Island projects: Club Island – re-open channels connecting Flynn Bay with St. Lawrence River; Delaney Bay marsh – re-open historic channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat.
PFW-52	St. Lawrence	Northern pike	PFW	Work in conjunction with the NRCS and the local Soil and Water Conservation District to provide technical assistance on agricultural best management practices (BMPs), including cattle exclusion fencing and stream bank restoration in the watershed.
PFW-53	St. Lawrence	Northern pike	PFW	Work with Regional Office to establish media news release and fact sheet detailing projects and information for interested landowners and general public.
PFW-54	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	American black duck	PFW & CPA	Develop fact sheets and best management practices to minimize impacts to black ducks.
PFW-55	Finger Lakes/Onondaga	Brook trout	PFW & CPA	Coordinate with partners to identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
PFW-56	Lower Hudson	Bog turtle	PFW & ES	Continue habitat restoration projects in focused areas: meet with NRCS, TNC, and NYSDEC to determine how FWS can best assist; provide technical assistance to NRCS as requested; assist with habitat restoration projects as NRCS WRP cost-share or Partners stand-alone projects; fund Jason Tesauro to continue landowner outreach, surveys, development of site plans, and monitoring. 1 project confirmed; 2 more in planning.



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ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
PFW-57	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	Bog turtle	PFW & ES	Participate in Rangewide Bog Turtle Initiative: participate in conference calls; assist Alison Whitlock in planning and convening next workshop.
PFW-58	Great Lakes	Bog turtle	PFW & ES	Westbury bog: Develop a restoration plan; implementation contingent on landowner approval.
PFW-59	Lower Hudson, Upper Hudson	New England cottontail	PFW & ES	Participate in NRCS NEC Restoration Initiative, including: participate in initial conference calls; assist NRCS with ranking criteria for FY2011 WHIP and in signing up landowners for FY2011 WHIP; provide technical assistance to NRCS for development of outreach products as needed; attend NRCS public/landowner information sessions if applicable; convene meeting (Millbrook) with partner agencies to (1) sign them up into WHIP if possible and (2) develop landowner outreach strategy to sign additional landowners into the program to meet NRCS FY2011 goals (40 acres). PFW to deliver identified projects, funding dependent.
PFW-60	St. Lawrence	American black duck	PFW & FEMRF	Restore 60 acres of grassland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
PFW-61	St. Lawrence	American black duck	PFW & FEMRF	Restore 60 acres of wetland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
PFW-62	St. Lawrence	American eel	PFW & FEMRF	Identify and prioritize streams for eel passage, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan: Evaluate three tributaries per year for fish barriers (for FY2011 tributaries are: Barretts, Mullett, Brandy) and develop plans for barrier mitigation to be submitted to the FAC); look at fish barrier mitigation on Oswegatchie River through relicensing process at two locations; investigate opportunity to reopen FERC license at Ogdensburg to require upstream and downstream fish passage.
PFW-63	St. Lawrence	Lake sturgeon	PFW & FEMRF	Work with NYSDEC to identify locations to place spawning substrate beds in tributaries to the St. Lawrence River.
PFW-64	Great Lakes	Lake sturgeon	PFW & FEMRF	Work with NYSDEC to begin to identify opportunities for the placement of spawning substrate beds in tributaries to Lake Ontario.
PFW-65	St. Lawrence	Northern pike	PFW & FEMRF	Assist landowners in identifying suitable habitat on their properties, threats to those habitats, and references for technical assistance in implementing habitat improvement projects.
PFW-66	St. Lawrence	Northern pike	PFW & FEMRF	Continue FEMRF efforts towards pursuing and funding sound proposals that would contribute to northern pike recovery.

Appendix 4: NYFO/LIFO Action Items by PROGRAM

ID	FOCAL AREA	SPECIES	PROGRAM	ITEM
PFW-67	St. Lawrence	Northern pike	PFW & FEMRF	Continue Fish Barrier Assessment & Mitigation project: mitigate significant barriers; work to obtain funding for Stream Habitat Survey/Fish Response project. FY2011 work on three stream systems: Barretts, Mullett, Brandy.
PFW-68	St. Lawrence	Northern pike	PFW & FEMRF	Initiate Stream Habitat Survey/Fish Response project proposal; working in conjunction with Fish Barrier Assessment & Mitigation project.
PFW-69	St. Lawrence	Northern pike	PFW & FEMRF	Participate in Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership.
PFW-70	St. Lawrence	Northern pike	PFW & FEMRF	Work with FEMRF funded contractors to determine marshes with highest potential.
PFW-71	St. Lawrence	American eel	PFW & FEMRF & CPA	Coordinate with developing Great Lakes Landscape Conservation Cooperative and Great Lakes Fish Habitat Partnership.
PFW-72	Finger Lakes/ Onondaga	American black duck	PFW & IT	Locate high quality migratory stopover habitat in the watershed utilizing GIS tools.
PFW-73	Upper Hudson	Karner blue butterfly	PFW & IT & ES	Update our website with recent projects like Spencer.
PFW-74	Great Lakes, St. Lawrence	Bobolink	PFW & IT & CPA	Analyze existing areas of habitat to determine potential breeding areas; analyze breeding bird survey data to focus efforts.

Note: Species with no action items for FY2011: clubshell

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American black duck	CPA-1	Great Lakes, St. Lawrence	CPA	Coordinate with FWS Region 3 relative to potential impacts from offshore wind projects (determine if offshore wind projects could have a negative impact to waterfowl).
American black duck	CPA-2	St. Lawrence	CPA	Influence other agencies and the International Joint Commission decisions on Lake and River water level management by providing substantive comments on proposed water level regulation protocol.
American black duck	CPA-3	Great Lakes	CPA	Participate in Mitigation Banking Review Teams for Rochester Cornerstone and Raymond Road mitigation banking teams to review and authorize mitigation banks.
American black duck	CPA-4	Finger Lakes/Onondaga, Great Lakes, St. Lawrence, Upper Hudson	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.
American black duck	CPA-5	Great Lakes, St. Lawrence	CPA	Provide substantive comments on proposed wind farms. including the Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie and Ontario Wind Farm proposals to both Federal, State and local agencies with regulatory influence over windpower project siting and operation.
American black duck	CPA-92	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	CPA & PFW	Develop fact sheets and best management practices to minimize impacts to black ducks.
American black duck	EC-1	St. Lawrence	EC	Consider black duck habitat restoration when developing St. Lawrence NRDAR case restoration.
American black duck	EC-2	Upper Hudson	EC	Coordinate Hudson River PCBs Site BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
American black duck	EC-3	Finger Lakes/Onondaga	EC	Coordinate Onondaga Lake Superfund Site BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
American black duck	EC-4	Finger Lakes/Onondaga	EC	Develop Onondaga NRDAR case; consider black duck habitat restoration when developing restoration.
American black duck	EC-5	Upper Hudson	EC	Manage assessment for FWS for the Hudson River NRDA; monitor waterfowl PCB levels and determine potential injuries.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American black duck	EC-6	Great Lakes	EC	Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea (of the Buffalo/Niagara Rivers NRDA case); if/when possible, use NRDAR funds toward black duck habitat restoration.
American black duck	EC-7	Great Lakes	EC	Monitor wetland habitat at Joseph Davis State Park (Love Canal Settlement).
American black duck	EC-8	Great Lakes	EC	Prepare expedited preassessment document to determine whether PCC Gowanda NPL Site poses threats to trust resources and opportunity exists for NRDA assessment work.
American black duck	FEMRF-19	St. Lawrence	FEMRF & PFW	Restore 60 acres of grassland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
American black duck	FEMRF-20	St. Lawrence	FEMRF & PFW	Restore 60 acres of wetland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
American black duck	IT-1	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	IT	Post fact sheets/BMPs for this species on our website.
American black duck	IT-12	Finger Lakes/Onondaga	IT & PFW	Locate high quality migratory stopover habitat in the watershed utilizing GIS tools.
American black duck	PFW-1	Finger Lakes/Onondaga	PFW	Identify additional restoration opportunities in Owasco Inlet and Owasco Lake.
American black duck	PFW-2	Upper Hudson	PFW	Meet with NRCS to assess potential WRP sites in Washington County.
American black duck	PFW-3	Finger Lakes/Onondaga	PFW	Restore 10 acres of emergent wetlands and associated uplands to benefit black ducks in the Great Lakes watershed (GLRI) which includes the Finger Lakes drainage basin.
American black duck	PFW-4	Great Lakes	PFW	Restore 30 acres of grassland habitat to benefit black ducks in the Great lakes watershed.
American black duck	PFW-5	Great Lakes	PFW	Restore 30 acres of wetland habitat to benefit black ducks in the Great lakes watershed.
American black duck	PFW-54	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	PFW & CPA	Develop fact sheets and best management practices to minimize impacts to black ducks.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American black duck	PFW-60	St. Lawrence	PFW & FEMRF	Restore 60 acres of grassland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
American black duck	PFW-61	St. Lawrence	PFW & FEMRF	Restore 60 acres of wetland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority.
American black duck	PFW-72	Finger Lakes/ Onondaga	PFW & IT	Locate high quality migratory stopover habitat in the watershed utilizing GIS tools.
American eel	CPA-6	Lower Hudson	CPA	Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews : Normanskill, Stuyvesant Falls.
American eel	CPA-7	St. Lawrence	CPA	Work with MRNFQ through International Eel Passage Group re. overfishing.
American eel	CPA-8	St. Lawrence	CPA	Minimize mortality on the Oswegatchie River through the FERC licensing process: provide fish protection and downstream passage at two developments of the Oswegatchie River Project ; investigate opportunities to reopen the license at Ogdensburg to provide fish protection and downstream passage.
American eel	CPA-9	St. Lawrence	CPA	Minimize mortality on the St. Regis River through the FERC licensing process: investigate decommissioning/dam removal during Hogansburg relicensing ; investigate fish protection and passage alternatives at Hogansburg.
American eel	CPA-10	Lower Hudson, St. Lawrence	CPA	Review dredging projects for impacts to eels.
American eel	CPA-11	St. Lawrence	CPA	Seek to minimize loss of habitat value by influencing FERC minimum flow decisions: Green Island.
American eel	CPA-12	Lower Hudson, St. Lawrence	CPA	Seek to minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, and dredging and placement of fill in streams and wetlands.
American eel	CPA-13	Lower Hudson, St. Lawrence	CPA	Seek to minimize loss of habitat value by influencing FERC minimum flow decisions.
American eel	CPA-73	Lower Hudson	CPA & EC	Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat.
American eel	CPA-77	St. Lawrence, Lower Hudson	CPA & ESA	Address status assessment and listing proposal.
American eel	CPA-81	St. Lawrence	CPA & FEMRF	Attend annual IEPG to address overfishing issues.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American eel	CPA-82	St. Lawrence	CPA & FEMRF	Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts; draft plan has been completed to address downstream passage in the St. Lawrence.
American eel	CPA-83	St. Lawrence	CPA & FEMRF	Hold at least two FEMRF Eel Study Group meetings annually to further efforts towards proposed approach to address turbine mortality ; the Eel Study Group will review FEMRF eel project proposals.
American eel	CPA-84	St. Lawrence	CPA & FEMRF	Hold at least two Fisheries Advisory Council meetings annually to discuss FEMRF proposals.
American eel	CPA-85	St. Lawrence	CPA & FEMRF	Lead International Eel Passage Group meetings; develop and seek funding approaches to address turbine mortality through trap/transport alternatives to foster international support.
American eel	CPA-90	St. Lawrence	CPA & FEMRF & PFW	Coordinate with developing Great Lakes Landscape Conservation Cooperative and Great Lakes Fish Habitat Partnership.
American eel	EC-9	St. Lawrence, Lower Hudson	EC	Determine if contaminants are a significant threat to eels; continue with the second year of the funded Off Refuge laboratory study, Reproductive Effects of Contaminants on Artificially Matured and Fertilized American eels.
American eel	EC-10	Lower Hudson	EC	Manage assessment for FWS for the Hudson River NRDA; review results of fish toxicity pilot study and determine next steps; consider restoration projects that benefit American eel, if possible.
American eel	EC-11	St. Lawrence	EC	Manage the St. Lawrence River NRDA case; consider restoration projects that benefit American eel, if possible.
American eel	EC-46	Lower Hudson	EC & CPA	Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat.
American eel	ESA-106	St. Lawrence, Lower Hudson	ESA & CPA	Address status assessment and listing proposal.
American eel	FEMRF-1	St. Lawrence	FEMRF	Facilitate habitat preservation through coordination with land trusts (Thousand Islands Land Trust).
American eel	FEMRF-2	St. Lawrence	FEMRF	Via FEMRF funding, continue research determined necessary by the USFWS to support upstream and downstream passage of eel at the St. Lawrence-FDR Power Project.
American eel	FEMRF-10	St. Lawrence	FEMRF & CPA	Attend annual IEPG to address overfishing issues.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American eel	FEMRF-11	St. Lawrence	FEMRF & CPA	Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts; draft plan has been completed to address downstream passage in the St. Lawrence.
American eel	FEMRF-12	St. Lawrence	FEMRF & CPA	Hold at least two FEMRF Eel Study Group meetings annually to further efforts towards proposed approach to address turbine mortality ; the Eel Study Group will review FEMRF eel project proposals.
American eel	FEMRF-13	St. Lawrence	FEMRF & CPA	Hold at least two Fisheries Advisory Council meetings annually to discuss FEMRF proposals.
American eel	FEMRF-14	St. Lawrence	FEMRF & CPA	Lead International Eel Passage Group meetings; develop and seek funding approaches to address turbine mortality through trap/transport alternatives to foster international support.
American eel	FEMRF-21	St. Lawrence	FEMRF & PFW	Identify and prioritize streams for eel passage, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan: Evaluate three tributaries per year for fish barriers (for FY2011 tributaries are: Barretts, Mullett, Brandy) and develop plans for barrier mitigation to be submitted to the FAC); look at fish barrier mitigation on Oswegatchie River through relicensing process at two locations; investigate opportunity to reopen FERC license at Ogdensburg to require upstream and downstream fish passage.
American eel	FEMRF-30	St. Lawrence	FEMRF & PFW & CPA	Coordinate with developing Great Lakes Landscape Conservation Cooperative and Great Lakes Fish Habitat Partnership.
American eel	PFW-6	Lower Hudson, St. Lawrence	PFW	Provide technical assistance on stream restoration projects in the watershed, as requested.
American eel	PFW-62	St. Lawrence	PFW & FEMRF	Identify and prioritize streams for eel passage, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan: Evaluate three tributaries per year for fish barriers (for FY2011 tributaries are: Barretts, Mullett, Brandy) and develop plans for barrier mitigation to be submitted to the FAC); look at fish barrier mitigation on Oswegatchie River through relicensing process at two locations; investigate opportunity to reopen FERC license at Ogdensburg to require upstream and downstream fish passage.
American eel	PFW-71	St. Lawrence	PFW & FEMRF & CPA	Coordinate with developing Great Lakes Landscape Conservation Cooperative and Great Lakes Fish Habitat Partnership.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American hart's-tongue fern	ESA-1	Finger Lakes/ Onondaga	ESA	Coordinate with NYSOPRHP regarding their planned invasive species management.
American hart's-tongue fern	ESA-2	Finger Lakes/ Onondaga	ESA	Provide annual RDC information to Region 4 as requested.
American shad	CPA-14	Upper Susquehanna	CPA	Assist regulatory agencies and the public in providing recommendations for reducing sediment non-point source pollution through best management strategies in priority watersheds: Butternut, Unadilla, Genegantslet, Owego Creek, Tioughnioga .
American shad	CPA-15	Upper Susquehanna	CPA	Provide stream protection guidelines via CPA permit and project review.
American shad	CPA-91	Upper Susquehanna	CPA & IT	Distribute BMP information on our website.
American shad	EC-12	Upper Susquehanna	EC	Conduct fish sampling, within the Susquehanna watershed, to evaluate emergent contaminants.
American shad	IT-7	Upper Susquehanna	IT & CPA	Distribute BMP information on our website.
American shad	PFW-7	Upper Susquehanna	PFW	Participate in State technical committee, subcommittee work to provide technical assistance on programs and projects which minimize sediment loads in streams, and which may provide for establishment of buffers.
American shad	PFW-8	Upper Susquehanna	PFW	Provide technical assistance on stream restoration projects in the Upper Susquehanna watershed; continue natural restoration of the Canasawacta (target is 1/4 mile).
American shad	PFW-9	Upper Susquehanna	PFW	Work with partner organizations to prioritize barriers to be targeted for removal.
American woodcock	EC-13	Upper Hudson	EC	Manage assessment for FWS for the Hudson River NRDA; assess avian injury for the Hudson River NRDA, including peer review of avian studies
American woodcock	EC-45	Great Lakes	EC	Conduct restoration planning and implementation for the Hi View Terrace NRD settlement
American woodcock	IT-2	Great Lakes, Upper Susquehanna, St. Lawrence, Upper Hudson	IT	Put Landowners Guide to Woodcock Management up on NYFO web site.
American woodcock	PFW-10	Great Lakes, Upper Susquehanna	PFW	Complete 100 acres of early successional habitat projects within the Great Lakes and Upper Susquehanna Focal Areas.



APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
American woodcock	PFW-11	Great Lakes, Upper Susquehanna	PFW	Coordinate logistics with NWRS R5 Hydro-Ax.
American woodcock	PFW-12	Great Lakes, Upper Susquehanna, St. Lawrence, Upper Hudson	PFW	Educate landowners during site visits when potential habitat projects are present.
Bald eagle	CPA-16	Great Lakes, St. Lawrence, Lower Hudson	CPA	Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes.
Bald eagle	CPA-17	Great Lakes, St. Lawrence, Lower Hudson	CPA	Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current.
Bald eagle	CPA-18	Great Lakes, St. Lawrence, Lower Hudson	CPA	Investigate options for funding to assist the state with post-listing activities.
Bald eagle	CPA-19	Great Lakes, St. Lawrence, Lower Hudson	CPA	Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles.
Bald eagle	CPA-20	Lower Hudson	CPA	Manage assessment for FWS for the Hudson River NRDA; review bald eagle data and assess status of injury.
Bald eagle	CPA-21	Great Lakes, St. Lawrence, Lower Hudson	CPA	Meet with new Northern BGEPA coordinator to discuss an approach to compliance.
Bald eagle	CPA-22	Great Lakes, St. Lawrence, Lower Hudson	CPA	Provide substantive comments to the regulatory agencies that provide best management practices, mitigation recommendations for eagle conservation when in suitable habitat.
Bald eagle	CPA-23	Great Lakes, St. Lawrence, Lower Hudson	CPA	Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Bald eagle	CPA-24	Lower Hudson	CPA	Send letter to rail companies reminding them of need to pursue authorization of incidental take; meet with NYSDEC, SOL-NE, BE coordinator and LE to strategize next steps, by mid November 2010; by 31 December, 2010, convene a multiparty meeting to discuss next steps with the rail companies and their attorneys.
Bald eagle	CPA-25	Great Lakes, St. Lawrence, Lower Hudson	CPA	Work with the NYSDEC, industry, other Field Offices, Regional Office and species experts to identify advanced conservation practices which will avoid and minimize take of eagles and other large raptors.
Bald eagle	EC-43	Great Lakes	EC	Investigate development of an On-/Off-Refuge research proposal to address impact of contaminants on osprey and/or other avian species and seeking funding for such work.
Blanding's turtle	CPA-26	Lower Hudson, St. Lawrence, Upper Hudson	CPA	Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species.
Blanding's turtle	CPA-27	Lower Hudson, St. Lawrence, Upper Hudson	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles.
Blanding's turtle	CPA-28	St. Lawrence	CPA	Work with the New York Power Authority to monitor success of the installed nesting berm project (required as condition of hydropower relicensing).
Blanding's turtle	EC-14	St. Lawrence	EC	Consider Blanding's turtle restoration projects in settlement negotiations regarding St. Lawrence NRDA.
Blanding's turtle	EC-15	Lower Hudson	EC	Prepare expedited pre-assessment document to determine whether Harbor at Hastings NPL Site poses threats to trust resources and opportunity exists for NRDA assessment work.
Blanding's turtle	EC-16	Lower Hudson	EC	Prepare expedited pre-assessment document to determine whether Hertel landfill (NPL Site) poses threats to trust resources and opportunity exists for NRDA assessment work.
Blanding's turtle	ESA-3	Lower Hudson, St. Lawrence, Upper Hudson	ESA	Attend and provide input at NYSDEC Recovery Plan meetings, as requested. Assist DEC with development of BMPs, threats assessment, and mitigation strategies, as requested.
Blanding's turtle	ESA-4	Lower Hudson, St. Lawrence, Upper Hudson	ESA	Coordinate with the NYSDEC to determine survey schedule. For St. Lawrence focal area coordinate additionally with Glen Johnson (SUNY Potsdam).
Blanding's turtle	ESA-5	Lower Hudson, St. Lawrence, Upper Hudson	ESA	Provide Service support for 2011 multi-state State Wildlife Grant Blanding's turtle proposal submission, with a priority given to the population genetics research, as requested.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Bobolink	CPA-29	Great Lakes, St. Lawrence	CPA	Prioritize permit review in grassland habitat.
Bobolink	CPA-94	Great Lakes, St. Lawrence	CPA & PFW & IT	Analyze existing areas of habitat to determine potential breeding areas; analyze breeding bird survey data to focus efforts.
Bobolink	EC-17	St. Lawrence	EC	Consider bobolink restoration projects in settlement negotiations regarding St. Lawrence NRDA.
Bobolink	IT-3	Great Lakes, St. Lawrence	IT	Create map for possible bobolink sites of concern.
Bobolink	IT-4	Great Lakes, St. Lawrence	IT	NY Audubon is involved in bobolink conservation and may have data layers we can use; check studies by Cornell – in vicinity of Madison Co. NRCS has shape files for priority areas for CRP and WHP.
Bobolink	IT-8	Great Lakes, St. Lawrence	IT & CPA & PFW	Analyze existing areas of habitat to determine potential breeding areas; analyze breeding bird survey data to focus efforts.
Bobolink	PFW-13	Great Lakes, St. Lawrence	PFW	Restore 50 acres of early successional grassland habitat to benefit bobolink and other birds with similar habitat needs at project site patch size of $\geq 10$ acres.
Bobolink	PFW-74	Great Lakes, St. Lawrence	PFW & IT & CPA	Analyze existing areas of habitat to determine potential breeding areas; analyze breeding bird survey data to focus efforts.
Bog turtle	CPA-78	Lower Hudson	CPA & ESA	Recommend surveys for this species during project reviews.
Bog turtle	ESA-6	Lower Hudson	ESA	Assist with health assessment with Wildlife Conservation Society: assist with field collection of samples; provide grant oversight.
Bog turtle	ESA-7	Lower Hudson	ESA	Conduct proactive surveys to locate additional populations: complete grant agreement for contractor (Tesauro); manage grant agreement; apply for additional funding.
Bog turtle	ESA-8	Finger Lakes/ Onondaga, Great Lakes	ESA	Consult with Dr. Rosenbaum and NYSDEC to identify priority sites for invasive plant control.
Bog turtle	ESA-9	Lower Hudson	ESA	Coordinate with PAFO, NJFO, NEFO and partners on goal for NY for HHRU subunits.
Bog turtle	ESA-10	Finger Lakes/ Onondaga, Great Lakes	ESA	Determine goal, with PAFO, for NY/PA for Prairie Peninsula/Lake Plain Recovery Unit.
Bog turtle	ESA-11	Finger Lakes/ Onondaga, Great Lakes	ESA	Develop a PPLPRU recovery implementation plan by August 1, 2011.
Bog turtle	ESA-12	Lower Hudson	ESA	Hold initial call/meeting to reinvigorate Hudson/Housatonic team.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Bog turtle	ESA-13	Lower Hudson	ESA	Complete 1-3 year implementation plan for Hudson, Housatonic, and Wallkill recovery subunits by August 1, 2011.
Bog turtle	ESA-14	Finger Lakes/ Onondaga, Great Lakes	ESA	Initiate Prairie Peninsula/Lake Plain Recovery Unit implementation team.
Bog turtle	ESA-15	Finger Lakes/ Onondaga, Great Lakes	ESA	Manage grant agreement for SUNY Oswego 2010 GLRI Phase 1 survey project.
Bog turtle	ESA-16	Lower Hudson	ESA	Meet with ESF to learn more about developing population estimates for Perry Preserve.
Bog turtle	ESA-17	Lower Hudson	ESA	Meet with NRCS on status of WRP projects and plans.
Bog turtle	ESA-18	Finger Lakes/ Onondaga, Great Lakes	ESA	Provide assistance to Regional Coordinator for development of 5-year review.
Bog turtle	ESA-19	Finger Lakes/ Onondaga, Great Lakes	ESA	Provide technical assistance to SUNY Oswego to develop follow-up proposal for Phase 2 surveys for GLRI grant.
Bog turtle	ESA-20	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	ESA	Utilize materials on pipelines from NiSource HCP to develop pipeline factsheet.
Bog turtle	ESA-107	Lower Hudson	ESA & CPA	Recommend surveys for this species during project reviews.
Bog turtle	ESA-116	Lower Hudson	ESA & PFW	Continue habitat restoration projects in focused areas: meet with NRCS, TNC, and NYSDEC to determine how FWS can best assist; provide technical assistance to NRCS as requested; assist with habitat restoration projects as NRCS WRP cost-share or Partners stand-alone projects; fund Jason Tesauro to continue landowner outreach, surveys, development of site plans, and monitoring. 1 project confirmed; 2 more in planning.
Bog turtle	ESA-117	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	ESA & PFW	Participate in Rangewide Bog Turtle Initiative: participate in conference calls; assist Alison Whitlock in planning and convening next workshop.
Bog turtle	ESA-118	Great Lakes	ESA & PFW	Westbury bog: Develop a restoration plan; implementation contingent on landowner approval.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Bog turtle	IT-5	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	IT	Post BMPs for pipelines on website.
Bog turtle	PFW-56	Lower Hudson	PFW & ES	Continue habitat restoration projects in focused areas: meet with NRCS, TNC, and NYSDEC to determine how FWS can best assist; provide technical assistance to NRCS as requested; assist with habitat restoration projects as NRCS WRP cost-share or Partners stand-alone projects; fund Jason Tesaro to continue landowner outreach, surveys, development of site plans, and monitoring. 1 project confirmed; 2 more in planning.
Bog turtle	PFW-57	Finger Lakes/ Onondaga, Great Lakes, Lower Hudson	PFW & ES	Participate in Rangewide Bog Turtle Initiative: participate in conference calls; assist Alison Whitlock in planning and convening next workshop.
Bog turtle	PFW-58	Great Lakes	PFW & ES	Westbury bog: Develop a restoration plan; implementation contingent on landowner approval.
Broad-winged hawk	CPA-30	Allegheny	CPA	Participate in Hawk Watch sites/banding stations (Chautauqua Ridge).
Broad-winged hawk	CPA-31	Great Lakes	CPA	Participate in Hawk Watch sites/banding stations (Derby Hill).
Broad-winged hawk	CPA-32	Great Lakes	CPA	Prioritize permit review in breeding areas of this species (forests and lakeshore); influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
Broad-winged hawk	CPA-33	Allegheny, Great Lakes	CPA	Provide substantive Federal agency comments on proposed Federal actions regarding wind energy projects to minimize impacts to this species; coordinate with other offices involved in wind power project siting to assess potential for additive effects to the species in other parts of the species range including the length of their migratory routes (through Pennsylvania for example).
Broad-winged hawk	CPA-34	Allegheny, Great Lakes	CPA	Provide substantive Federal agency comments on proposed Federal agency actions (including land development) with likely adverse impacts to this species and/or its habitat.
Broad-winged hawk	CPA-35	Allegheny	CPA	Review energy development projects proposed in large intact blocks of forest habitat and recommend siting adjustments.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Broad-winged hawk	CPA-36	Great Lakes	CPA	Review energy development projects proposed in near lakeshore areas, and in large intact blocks of forest habitat. If expansion of the facilities at Nine Mile Point, Oswego County, goes forward, work with other agencies and the developer to provide for continued availability of broad winged hawk breeding, foraging and resting areas along the south shore of Lake Ontario. Provide recommendations for forest patch size that needs to be maintained, and habitat connections to wetlands for foraging.
Broad-winged hawk	CPA-37	Allegheny	CPA	Review wind energy projects to minimize impacts to this species by directing turbine placement away from large tracts of intact forest.
Broad-winged hawk	CPA-38	Great Lakes	CPA	Review wind energy projects to minimize impacts to this species by direction turbine placement away from large tracts of intact forest, and away from the lakeshore areas.
Broad-winged hawk	CPA-39	Allegheny	CPA	Seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured.
Broad-winged hawk	CPA-40	Allegheny, Great Lakes	CPA	Seek to influence regulatory agency decisions by providing comments on projects which may result in long term impacts on habitat structure.
Broad-winged hawk	CPA-41	Allegheny, Great Lakes	CPA	Seek to influence regulatory agency decisions by providing input into conservation measures which would minimize impacts of development in forested areas near the lakeshore.
Broad-winged hawk	CPA-74	Great Lakes	CPA & EC	Seek to influence regulatory agency decisions; seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured. Seek to minimize use of pesticides in new developments to ensure viable populations of amphibian prey; minimized use of pesticides to control mosquitoes; sprays will also impact larger insects which are an important prey item for broad-wings.
Broad-winged hawk	EC-47	Great Lakes	EC & CPA	Seek to influence regulatory agency decisions; seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured. Seek to minimize use of pesticides in new developments to ensure viable populations of amphibian prey; minimized use of pesticides to control mosquitoes; sprays will also impact larger insects which are an important prey item for broad-wings.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Brook trout	CPA-42	Finger Lakes/ Onondaga, Great Lakes, Upper Susquehanna, Upper Hudson	CPA	Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software.
Brook trout	CPA-43	Upper Susquehanna	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout, especially with regards to Marcellus shale gas exploration, via hydrofracturing of geologic formations.
Brook trout	CPA-75	Great Lakes	CPA & EC	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout.
Brook trout	CPA-93	Finger Lakes/ Onondaga	CPA & PFW	Coordinate with partners to identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
Brook trout	EC-18	Upper Susquehanna	EC	When possible, use NRDAR restoration funds to restore and protect vernal pools. Consider brook trout when evaluating restoration projects for Richardson Hill NRDA case.
Brook trout	EC-44	Upper Hudson River	EC	Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment; review fish data and assess status of fish injury; if possible, use NRDA restoration funds to restore and protect streams identified.
Brook trout	EC-48	Great Lakes	EC & CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout.
Brook trout	PFW-14	Upper Hudson	PFW	Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control: Onesquethaw Creek, Kayaderosseras Creek, Battenkill, Upper Hoosic River.
Brook trout	PFW-15	Finger Lakes/ Onondaga	PFW	Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control: Owasco Inlet, Cayuga Inlet (1/2 mile).
Brook trout	PFW-16	Upper Susquehanna	PFW	Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control: Genaganslet, Canasawacta, Wilsey Creek.
Brook trout	PFW-17	Upper Hudson	PFW	Restoration work via natural stream design on 500 feet of the Onesquethaw Creek.
Brook trout	PFW-18	Upper Hudson	PFW	Restoration work via natural stream design on 2,000 feet of the Kayaderosseras Creek.
Brook trout	PFW-19	Upper Hudson	PFW	Restoration work via natural stream design on 1 mile of the Battenkill.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Brook trout	PFW-20	Upper Hudson	PFW	Restoration work via natural stream design on 1 mile of the upper reaches of the Hoosic River.
Brook trout	PFW-21	Finger Lakes/ Onondaga	PFW	Apply for EBTJV money for the implementation of 0.5 miles of in-stream restoration.
Brook trout	PFW-22	Allegheny, Finger Lakes/Onondaga, Great Lakes, Upper Susquehanna, Upper Hudson	PFW	Conduct a statewide training session for County SWCD staff on natural stream design (March 2011).
Brook trout	PFW-23	Finger Lakes/ Onondaga	PFW	Conduct pilot classroom project – Trout Unlimited’s Trout in the Classroom.
Brook trout	PFW-24	Upper Susquehanna	PFW	Continue restoration work via natural stream design on 0.25 miles Canasawacta Creek.
Brook trout	PFW-25	Finger Lakes/ Onondaga	PFW	Design habitat enhancement projects which provide increased flow, stream shading, pool cover, increased availability of riffle habitat (one project).
Brook trout	PFW-26	Upper Susquehanna	PFW	Guide conservation activities in strategic locations forming buffers to protect the watershed from uncontrolled non point source pollution, in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance.
Brook trout	PFW-27	Upper Susquehanna	PFW	Guide conservation activities in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance.
Brook trout	PFW-28	Allegheny	PFW	Meet with NYSDEC fisheries biologists to provide technical assistance on proposed and ongoing stream restoration/habitat enhancement work.
Brook trout	PFW-29	Finger Lakes/ Onondaga	PFW	Restoration work via natural channel design on Fall Creek (500’).
Brook trout	PFW-30	Great Lakes	PFW	Restoration work via natural stream design on 0.5 miles of Chittenango Creek.
Brook trout	PFW-31	Upper Susquehanna	PFW	Restoration work via natural stream design on 0.5 miles of Geneganslet Creek.
Brook trout	PFW-32	Great Lakes	PFW	Restoration work via natural stream design on 0.5 miles of Sandy Creek.
Brook trout	PFW-33	Great Lakes	PFW	Restoration work via natural stream design on 2, 200 feet of Clear Creek.
Brook trout	PFW-34	Great Lakes	PFW	Restoration work via natural stream design on Salmon River, and tributaries (about 0.5 mile in FY2011).



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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Brook trout	PFW-35	Upper Susquehanna	PFW	Restoration work via natural stream design on Wilsey Creek (1/4 mile).
Brook trout	PFW-36	Great Lakes	PFW	Work with LGLFRO to identify additional projects.
Brook trout	PFW-37	Upper Susquehanna	PFW	Work with NYSDEC, NRCS and Upper Susquehanna Conservation alliance to Identify projects. Priority projects identified for FY2011: Genaganslet (1/4 mile); assess Owego, Butternut, Otselic Creeks.
Brook trout	PFW-38	Upper Hudson	PFW	Work with NYSDEC, NRCS to identify projects for barriers to migration.
Brook trout	PFW-39	Upper Hudson	PFW	Work with NYSDOT Region 1 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage ; design and install culvert baffle systems with NYSDOT Region 1 to bury perched culverts as opportunities present themselves within this DOT region.
Brook trout	PFW-40	Great Lakes	PFW	Work with NYSDOT Region 3, 4 and 5 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage ; design and install culvert baffle systems with NYSDOT Region 3, 4 and 5, bury perched culverts as opportunities present themselves within this DOT region. (1 project confirmed for FY2011; potential for 1 additional project in FY2011.)
Brook trout	PFW-41	Upper Susquehanna	PFW	Work with NYSDOT Region 6 and 9 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage ; design and install culvert baffle systems with NYSDOT Region 6 and 9 to bury perched culverts as opportunities present themselves within these DOT regions. (1 project confirmed for FY2011.)
Brook trout	PFW-55	Finger Lakes/ Onondaga	PFW & CPA	Coordinate with partners to identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
Cerulean warbler	CPA-44	Allegheny, Finger Lakes/ Onondaga, Great Lakes	CPA	Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Cerulean warbler	CPA-45	Allegheny, Finger Lakes/Onondaga, Great Lakes	CPA	Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act process.
Cerulean warbler	CPA-46	Finger Lakes/Onondaga	CPA	Evaluate impact of wind turbines at specific sites (Alabama Ledge, Bishop, Cortland, Leicester, Enfield, Paragon, etc.); provide technical assistance and review monitoring reports.
Cerulean warbler	CPA-47	Allegheny, Great Lakes	CPA	Evaluate impact of wind turbines at specific sites (Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario, etc.); assist with monitoring.
Cerulean warbler	CPA-48	Allegheny	CPA	Evaluate impact of wind turbines in Allegany (Allegany Wind Farm in the Town of Allegany); assist with monitoring.
Cerulean warbler	CPA-49	Allegheny	CPA	Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess affects this will have on breeding habitat for the warbler.
Cerulean warbler	CPA-50	Allegheny, Finger Lakes/Onondaga, Great Lakes	CPA	Explore development of additional guidance based on species found in New York State; geographic patterns of migratory bat and bird use.
Cerulean warbler	CPA-51	Allegheny, Finger Lakes/Onondaga, Great Lakes	CPA	Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.
Cerulean warbler	CPA-52	Finger Lakes/Onondaga	CPA	Landscape planning for Owasco Flats.
Cerulean warbler	EC-19	Allegheny, Finger Lakes/Onondaga, Great Lakes	EC	Evaluate international options for NRDAR restoration projects when opportunity arises.
Cerulean warbler	EC-20	Allegheny, Finger Lakes/Onondaga, Great Lakes	EC	Include cerulean warblers in contaminants analysis for NRDAR and other projects.
Chittenango ovate amber snail	CPA-76	Finger Lakes/Onondaga	CPA & EC & ESA	Provide input into State and Federally-permitted activities which involve Chittenango Creek, upstream of the Falls as well as other permitted activities that may impact water quality in the Creek.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Chittenango ovate amber snail	EC-49	Finger Lakes/ Onondaga	EC & ESA & CPA	Provide input into State and Federally-permitted activities which involve Chittenango Creek, upstream of the Falls as well as other permitted activities that may impact water quality in the Creek.
Chittenango ovate amber snail	ESA-21	Finger Lakes/ Onondaga	ESA	Complete 5-year review.
Chittenango ovate amber snail	ESA-22	Finger Lakes/ Onondaga	ESA	Pursue final results of captive methodology development from USGS.
Chittenango ovate amber snail	ESA-23	Finger Lakes/ Onondaga	ESA	Pursue final results of genetics research from USGS; invite USGS to captive management workshop.
Chittenango ovate amber snail	ESA-24	Finger Lakes/ Onondaga	ESA	Apply for Preventing Extinction grant; conduct a workshop to determine the feasibility of ex situ conservation and craft a captive rearing plan; determine interested facilities; complete necessary contracts or cooperative agreements.
Chittenango ovate amber snail	ESA-25	Finger Lakes/ Onondaga	ESA	For summer 2010 surveys: enter data into Excel; enter data into Program MARK; using survey results and other pertinent data, conduct a population viability assessment for Chittenango ovate amber snail.
Chittenango ovate amber snail	ESA-110	Finger Lakes/ Onondaga	ESA & CPA & EC	Provide input into State and Federally-permitted activities which involve Chittenango Creek, upstream of the Falls as well as other permitted activities that may impact water quality in the Creek.
Common tern	CPA-53	Great Lakes, St. Lawrence	CPA	Great Lakes Colonial Waterbird Surveys conducted every 10 years - determine NY status: survey should be occurring soon.
Common tern	CPA-54	Great Lakes, St. Lawrence	CPA	Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat.
Common tern	CPA-55	St. Lawrence	CPA	Provide substantive Federal agency comments on the NYPA Common Tern Habitat Improvement Project.
Common tern	EC-21	Great Lakes, St. Lawrence	EC	Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats.
Common tern	EC-22	Great Lakes, St. Lawrence	EC	Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Common tern	EC-23	Great Lakes, St. Lawrence	EC	Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources.
Common tern	EC-24	Great Lakes	EC	Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea (of the Buffalo/Niagara Rivers NRDA case).
Common tern	EC-25	St. Lawrence	EC	Manage St. Lawrence River Environment case; consider restoration projects that benefit common tern.
Common tern	IT-6	Great Lakes, St. Lawrence	IT	Create map or shapefile of existing and potential common tern breeding and foraging areas for all NYFO programs.
Dwarf wedgemussel	ESA-26	Lower Hudson	ESA	Assist with development of measures for NiSource HCP.
Dwarf wedgemussel	ESA-27	Lower Hudson	ESA	Develop conservation framework, including standard conservation measures, for bridge projects.
Dwarf wedgemussel	ESA-28	Lower Hudson	ESA	Obtain final USGS E. Branch Delaware River Report.
Eastern hellbender	ESA-29	Allegheny, Upper Susquehanna	ESA	Provide technical assistance pertaining to State recovery plan.
Eastern hellbender	ESA-30	Allegheny, Upper Susquehanna	ESA	Coordinate with the Regional Office, Pennsylvania Field Office and other ES Field offices for the states of Maryland, Virginia, West Virginia regarding hellbender conservation efforts to tie-in with greater FWS strategic habitat planning.
Eastern hellbender	ESA-31	Allegheny, Upper Susquehanna	ESA	Assist DEC with creating priority site map.
Eastern hellbender	ESA-32	Allegheny, Upper Susquehanna	ESA	Assist DEC with developing a database repository.
Eastern hellbender	ESA-33	Allegheny, Upper Susquehanna	ESA	Develop decontamination protocol to counter disease ( <i>B.d.</i> ).
Eastern hellbender	ESA-34	Allegheny, Upper Susquehanna	ESA	Develop standardized data collection sheets for surveys.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Eastern hellbender	ESA-35	Allegheny	ESA	Provide any technical assistance needed to NYSDEC and Buffalo Zoo on captive propagation program.
Eastern hellbender	ESA-36	Upper Susquehanna	ESA	Provide any technical assistance needed to NYSDEC, ESF and USC regarding Susquehanna headstarting plan.
Eastern hellbender	ESA-37	Allegheny	ESA	Provide technical assistance when NYSDEC is prepared for first release of captive propagated individuals.
Eastern hellbender	ESA-38	Allegheny, Upper Susquehanna	ESA	Provide technical assistance with FWS status assessment (work being done by Columbus Field Office – Jeromy Applegate).
Eastern hellbender	ESA-39	Allegheny, Upper Susquehanna	ESA	Research what types of funding sources exist in order to conduct surveys, enhance hellbender habitat, captively raise hellbenders, etc.
Eastern hellbender	ESA-40	Allegheny, Upper Susquehanna	ESA	Assist DEC with surveys of historic and new sites to estimate current population sizes.
Eastern hellbender	ESA-41	Allegheny, Upper Susquehanna	ESA	Work with Buffalo State College on 2011 Hellbender Symposium.
Eastern hellbender	ESA-111	Allegheny, Upper Susquehanna	ESA & IT	Develop a website for hellbender or link to existing websites for outreach and contractors.
Eastern tiger salamander	EC-42	Long Island	EC	Investigate development of an On-/Off-Refuge research proposal to address impact of contaminants on this and/or other herpetile species and seek funding for such work.
Field sparrow	CPA-56	Upper Hudson	CPA	Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to field sparrows and/or their habitat based on identification of priority grassland habitats.
Golden-winged warbler	CPA-57	Allegheny	CPA	A NYFO Outreach representative will join the Northeast PIF Working Group. and share with NYFO staff as a FWS information resource.
Golden-winged warbler	CPA-58	Allegheny, St. Lawrence	CPA	Contact John Confer, Ithaca College, and communicate results of conversation to NYFO staff.
Golden-winged warbler	CPA-59	Allegheny, St. Lawrence	CPA	Review documentation and incidence of brown-headed cowbird parasitism upon this species in Allegheny and St. Lawrence watersheds and New York State: review literature; determine whether annual monitoring of nests of this species is presently ongoing in these watersheds and New York; produce a summary of this review to be shared with NYFO staff.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Golden-winged warbler	CPA-60	Allegheny, St. Lawrence	CPA	Review literature on hybridization with golden-winged warbler and gather information.
Golden-winged warbler	CPA-61	Allegheny	CPA	Review Marcellus shale gas development projects to minimize impacts to this species; contact NYSDEC to determine areas where permits have been issued for Marcellus shale gas development.
Golden-winged warbler	CPA-62	Allegheny, St. Lawrence	CPA	Review wind energy projects within the watershed to minimize impacts to this species.
Golden-winged warbler	EC-26	Allegheny, St. Lawrence	EC	Evaluate potential NRDAR cases (such as Sinclair Refinery (Allegheny) and St. Lawrence Environment (St. Lawrence) that may provide opportunity for scrub-shrub and golden-winged warbler habitat restoration.
Golden-winged warbler	PFW-42	Allegheny, St. Lawrence	PFW	Work with NRCS to provide technical assistance to restore acres and habitat utilizing the Wildlife Habitat Incentives Program; contact NRCS to determine ongoing consideration given to GWWA and share resources to date.
Houghton's goldenrod	ESA-42	Great Lakes	ESA	Coordinate with the FWS ELFO and species lead with regard to the current 5-year review.
Houghton's goldenrod	ESA-43	Great Lakes	ESA	Establish an open access research permit with the Bergen Swamp Preservation Society.
Indiana bat	EC-27	Finger Lakes/ Onondaga	EC	Prepare 2009 bat mercury NRDAR report for Onondaga Lake.
Indiana bat	EC-28	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	EC	White Nose Syndrome research- send all samples out for analysis.
Indiana bat	ESA-44	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Assist FWS Region 3 with finalizing Recovery Plan as requested.
Indiana bat	ESA-45	St. Lawrence, Lower Hudson, Upper Hudson	ESA	Assist NYSDEC with "ibat on year" winter 2010-2011 surveys; for St. Lawrence focal area: Glen Park.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Indiana bat	ESA-46	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Assist with captive bat management structured decision making process.
Indiana bat	ESA-47	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Assist with development of measures for NiSource HCP .
Indiana bat	ESA-48	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Assist with Ibat modeling SDM effort until completion: respond to data requests from USGS and R3; participate in calls during Beta testing; attend workshop to test model; assist with roll-out of model; provide TA to FOs with use of model.
Indiana bat	ESA-49	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Continue to rotate current Indiana bat/WNS display at nature center, updating display at least once each year.
Indiana bat	ESA-50	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Develop conservation framework, including standard conservation measures, for residential and commercial projects.
Indiana bat	ESA-51	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	ESA	Complete St. Lawrence Wind consultation.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Indiana bat	ESA-52	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Develop standardized approaches to evaluating wind projects and developing conservation measures: participate in multi-region project to develop guidance; participate in multi-region calls.
Indiana bat	ESA-53	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence,	ESA	Develop standardized protocols for use of bat detection systems to survey for Indiana bats: participate in Regional WNS funding discussions and promote funding of acoustic automation system; participate in team to revise Indiana bat survey protocols as requested; conduct 1 acoustic transect route 2-3 nights.
Indiana bat	ESA-54	Lower Hudson, Upper Hudson	ESA	Develop standardized protocols for use of bat detection systems to survey for Indiana bats: participate in Regional WNS funding discussions and promote funding automation of acoustic survey data analysis by FY10 Congressional pot; participate in Ibat/Wind Initiative protocol team as requested.
Indiana bat	ESA-55	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	ESA	Fort Drum Army Compatible Use Buffer program: participate in meetings/calls to target Ibat lands; provide technical assistance to Fort Drum with easement language; complete consultation on ACUB program.
Indiana bat	ESA-56	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	ESA	Fort Drum: Participate in semi-annual Natural Resources Branch Meetings, attending at least one in person and one over the phone; send recognition letter to Army; assist with summer transmission study by assisting with capture and processing of bats at condo 1-3 nights.
Indiana bat	ESA-57	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	New Indiana bat display: Provide technical assistance to the USFS in the development of a new display; receive transfer funding from USFS and develop contracts to complete display.
Indiana bat	ESA-58	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	ESA	Participate in consultation with Fort Drum.



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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Indiana bat	ESA-59	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Participate in R5 planning team to develop standardized roles/responsibilities for species leads.
Indiana bat	ESA-60	Lower Hudson, Upper Hudson	ESA	Review annual reports from Adams Fairacre Farms (FY11,12, NYFO ES)
Indiana bat	ESA-61	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	ESA	Review annual reports from Fort Drum and Fort Drum Connector.
Indiana bat	ESA-62	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Review NYSDEC permit conditions.
Indiana bat	ESA-63	Finger Lakes/Onondaga, Great Lakes, St. Lawrence	ESA	Coordination Regional review of Indiana bat permit.
Indiana bat	ESA-64	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	Update Indiana bat fact sheets and web materials.
Indiana bat	ESA-65	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	White Nose Syndrome (WNS)-related research: Assist with RFPs as requested; review proposals if requested to be on review team; provide grant oversight for FY08 and FY09 projects; assist with field work.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Indiana bat	ESA-66	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence, Lower Hudson, Upper Hudson	ESA	WNS National Plan: provide technical assistance during FWS and/or public review periods; participate in Communications Group.
Jefferson's salamander	CPA-63	Upper Susquehanna	CPA	Address vernal pools when reviewing permits.
Jefferson's salamander	CPA-64	Upper Susquehanna	CPA	Incorporate means to increase corridors between breeding and non-breeding habitat: influence regulatory agency decisions to incorporate measures to increase corridors between breeding and non-breeding habitat.
Jefferson's salamander	CPA-65	Upper Susquehanna	CPA	Minimize loss of habitat by influencing regulatory agency decisions and the permitting process regarding: regulated wetland losses; agricultural and forestry practices that diminish vernal pool habitat values for wildlife.
Jefferson's salamander	EC-29	Upper Susquehanna	EC	Coordinate Kentucky Avenue Wellfield BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
Jefferson's salamander	EC-30	Upper Susquehanna	EC	Prepare expedited preassessment document to determine whether Kentucky Avenue Wellfield NPL Site poses threats to trust resources and opportunity exists for NRDA assessment work.
Jefferson's salamander	EC-31	Upper Susquehanna	EC	When possible, use NRDAR restoration funds to restore and protect vernal pools; consider Jefferson/Blue spotted salamanders when evaluating restoration projects for Richardson Hill NRDA case.
Karner blue butterfly	ESA-67	Upper Hudson	ESA	Albany Landfill consultation: Monitor BO implementation.
Karner blue butterfly	ESA-68	Upper Hudson	ESA	Assist FWS Region 3 with review/comments for 5-year review.
Karner blue butterfly	ESA-69	Upper Hudson	ESA	Attend 1 KBB work day with TNC or APBPC.
Karner blue butterfly	ESA-70	Upper Hudson	ESA	Collect lupine/nectar seed.
Karner blue butterfly	ESA-71	Upper Hudson	ESA	Complete consultation for Beaver Pond residential development.
Karner blue butterfly	ESA-72	Upper Hudson	ESA	Complete grant agreement with APBPC for 2011 captive rearing, augmentation efforts; manage two grant agreements with APBPC: visit translocation sites, review reports and invoices.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Karner blue butterfly	ESA-73	Upper Hudson	ESA	Conduct site visits and document completed projects for two LE enforcement cases/settlement.
Karner blue butterfly	ESA-74	Upper Hudson	ESA	Meet with NYSDEC on annual basis to review work conducted under their 10(a)(1)(A) permit.
Karner blue butterfly	ESA-75	Upper Hudson	ESA	Multi-year Spencer Christmas Tree Farm office project: assist with additional clearing.
Karner blue butterfly	ESA-76	Upper Hudson	ESA	National Grid HCP: release for public comment; complete permit decision.
Karner blue butterfly	ESA-77	Upper Hudson	ESA	Participate in process of developing a State recovery plan as needed/requested.
Karner blue butterfly	ESA-78	Upper Hudson	ESA	Participate in twice yearly KBB team calls.
Karner blue butterfly	ESA-79	Upper Hudson	ESA	Provide technical assistance to partners for grant development; NYSDEC project: complete grant agreement paperwork; provide grant oversight.
Karner blue butterfly	ESA-80	Upper Hudson	ESA	Saratoga County Airport consultations: Monitor BO implementation.
Karner blue butterfly	ESA-81	Upper Hudson	ESA	Work with APBPC/TNC to showcase SHA and make a push for landowner sign-ups.
Karner blue butterfly	ESA-115	Upper Hudson	ESA & IT & PFW	Update our website with recent projects like Spencer.
Karner blue butterfly	IT-13	Upper Hudson	IT & PFW & ES	Update our website with recent projects like Spencer.
Karner blue butterfly	PFW-73	Upper Hudson	PFW & IT & ES	Update our website with recent projects like Spencer.
Lake sturgeon	CPA-66	St. Lawrence	CPA	Provide passage recommendations related to the relicensing of hydroelectric power generating facilities on tributaries to the St. Lawrence River, specifically the Oswegatchie River (Eel Weir Dam and Huevelton Dam).
Lake sturgeon	CPA-67	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon.
Lake sturgeon	CPA-68	St. Lawrence	CPA	Work with New York Power Authority to locate and place up to two spawning substrate beds below the St. Lawrence Power Project.
Lake sturgeon	EC-32	Great Lakes	EC	Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Lake sturgeon	EC-33	Great Lakes	EC	Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources.
Lake sturgeon	EC-34	Great Lakes	EC	Evaluate emerging contaminants in Rochester Embayment Area of Concern.
Lake sturgeon	EC-35	Great Lakes	EC	Manage Buffalo/Niagara Rivers NRDAR case; continue settlement negotiations with Buffalo PRPs including development of Restoration Compensation Determination Plan; conduct Preliminary Assessment Screen for the Towanda Subarea (of the Buffalo/Niagara Rivers NRDA case).
Lake sturgeon	EC-36	St. Lawrence	EC	Manage St. Lawrence NRDA River case; consider lake sturgeon restoration projects in settlement negotiations regarding the case.
Lake sturgeon	EC-37	Finger Lakes/ Onondaga	EC	Work with NYSDEC, to begin to identify opportunities for the placement of spawning substrate beds in Nine Mile Creek and Onondaga Creek as a NRDA restoration opportunity.
Lake sturgeon	FEMRF-3	St. Lawrence	FEMRF	Assist NYSDEC and USGS with surveys to determine current population levels of lake sturgeon and determine presence/absence of the species.
Lake sturgeon	FEMRF-4	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	FEMRF	Assist NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation.
Lake sturgeon	FEMRF-5	Great Lakes, St. Lawrence	FEMRF	Assist NYSDEC with 5-year population assessments through providing field assistance and PIT tagging supplies.
Lake sturgeon	FEMRF-6	Great Lakes, St. Lawrence	FEMRF	Develop NYFO FEMRF GIS Decision Support Tool to focus preservation efforts.
Lake sturgeon	FEMRF-7	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	FEMRF	Facilitate the writing of a New York State Lake Sturgeon Management Plan.
Lake sturgeon	FEMRF-8	Finger Lakes/ Onondaga, Great Lakes, St. Lawrence	FEMRF	Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range.
Lake sturgeon	FEMRF-9	St. Lawrence	FEMRF	Host NYS Lake Sturgeon Working Group meeting.
Lake sturgeon	FEMRF-22	St. Lawrence	FEMRF & PFW	Work with NYSDEC to identify locations to place spawning substrate beds in tributaries to the St. Lawrence River.
Lake sturgeon	FEMRF-23	Great Lakes	FEMRF & PFW	Work with NYSDEC to begin to identify opportunities for the placement of spawning substrate beds in tributaries to Lake Ontario.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Lake sturgeon	PFW-43	St. Lawrence	PFW	Conduct multi-year barrier assessments on 3 tributaries of the St. Lawrence River per year and make recommendations for removal.
Lake sturgeon	PFW-44	St. Lawrence	PFW	Remove up to 3 fish barriers per year. For FY2011: Sucker Brook.
Lake sturgeon	PFW-63	St. Lawrence	PFW & FEMRF	Work with NYSDEC to identify locations to place spawning substrate beds in tributaries to the St. Lawrence River.
Lake sturgeon	PFW-64	Great Lakes	PFW & FEMRF	Work with NYSDEC to begin to identify opportunities for the placement of spawning substrate beds in tributaries to Lake Ontario.
Leedy's roseroot	ESA-82	Finger Lakes/ Onondaga	ESA	Obtain 2010 data from Heritage Program.
Massasauga rattlesnake	CPA-79	Finger Lakes/ Onondaga, Great Lakes	CPA & ESA	Provide substantive comments on proposed actions with potential impacts on this species.
Massasauga rattlesnake	ESA-83	Finger Lakes/ Onondaga, Great Lakes	ESA	Grant oversight (NYSDEC GLRI 2010 proposal).
Massasauga rattlesnake	ESA-84	Finger Lakes/ Onondaga, Great Lakes	ESA	Respond to Candidate Notice of Review to FWS Region 3.
Massasauga rattlesnake	ESA-108	Finger Lakes/ Onondaga, Great Lakes	ESA & CPA	Provide substantive comments on proposed actions with potential impacts on this species.
New England cottontail	ESA-85	Lower Hudson, Upper Hudson	ESA	Assist NYSDEC with pellet collection.
New England cottontail	ESA-86	Lower Hudson, Upper Hudson	ESA	Co-host landowner outreach meeting with NRCS.
New England cottontail	ESA-87	Lower Hudson, Upper Hudson	ESA	Develop New York conservation goals using predictive modeling from SWG project as starting point.
New England cottontail	ESA-88	Lower Hudson, Upper Hudson	ESA	New York efforts: assist with development/review of focus area maps; develop goals for New York populations.
New England cottontail	ESA-89	Lower Hudson, Upper Hudson	ESA	Rangewide efforts: participate in monthly calls; participate in steering committee calls/meetings; assist with development of rangewide conservation strategy; review products from SWG grant.
New England cottontail	ESA-112	Lower Hudson, Upper Hudson	ESA & IT	Update website with NEC information and ongoing projects.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
New England cottontail	ESA-119	Lower Hudson, Upper Hudson	ESA & PFW	Participate in NRCS NEC Restoration Initiative, including: participate in initial conference calls; assist NRCS with ranking criteria for FY2011 WHIP and in signing up landowners for FY2011 WHIP; provide technical assistance to NRCS for development of outreach products as needed; attend NRCS public/landowner information sessions if applicable; convene meeting (Millbrook) with partner agencies to (1) sign them up into WHIP if possible and (2) develop landowner outreach strategy to sign additional landowners into the program to meet NRCS FY2011 goals (40 acres). PFW to deliver identified projects, funding dependent.
New England cottontail	IT-9	Lower Hudson, Upper Hudson	IT & ES	Update website with NEC information and ongoing projects.
New England cottontail	PFW-59	Lower Hudson, Upper Hudson	PFW & ES	Participate in NRCS NEC Restoration Initiative, including: participate in initial conference calls; assist NRCS with ranking criteria for FY2011 WHIP and in signing up landowners for FY2011 WHIP; provide technical assistance to NRCS for development of outreach products as needed; attend NRCS public/landowner information sessions if applicable; convene meeting (Millbrook) with partner agencies to (1) sign them up into WHIP if possible and (2) develop landowner outreach strategy to sign additional landowners into the program to meet NRCS FY2011 goals (40 acres). PFW to deliver identified projects, funding dependent.
Northeastern bulrush	ESA-90	Upper Susquehanna	ESA	Assess the impact of threats (e.g., herbivory, hydrology) at the known population and evaluation possible management techniques, if needed.
Northeastern bulrush	ESA-91	Upper Susquehanna	ESA	Conduct an initial count at the known population in order to determine population size and reproductive effort and conduct these counts every five years in order to understand these factors over time and population viability.
Northeastern bulrush	ESA-92	Upper Susquehanna	ESA	Contact the landowner of the single northeastern bulrush site in New York State for initial conversations about conservation.
Northeastern bulrush	ESA-93	Upper Susquehanna	ESA	Submit funding proposal for NY Natural Heritage Program to survey for additional populations.
Northeastern bulrush	ESA-94	Upper Susquehanna	ESA	Conduct training for U.S. Army Corps of Engineers in identifying potential habitat and the plant.
Northeastern bulrush	ESA-95	Upper Susquehanna	ESA	Develop fact sheet for this species.
Northeastern bulrush	ESA-113	Upper Susquehanna	ESA & IT	Construct a northeastern bulrush web page for the NYFO site linking information resources from PAFO.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Northeastern bulrush	IT-10	Upper Susquehanna	IT & ES	Construct a northeastern bulrush web page for the NYFO site linking information resources from PAFO.
Northern pike	CPA-69	St. Lawrence	CPA	Provide substantive Federal agency comments on proposed actions with likely adverse impacts to northern pike and/or their habitat.
Northern pike	CPA-70	St. Lawrence	CPA	Seek to influence regulatory agencies regarding land use practices by providing substantive comments on agency actions (e.g. NRCS State Technical Committee).
Northern pike	CPA-86	St. Lawrence	CPA & FEMRF	Attend meetings with other organization/agencies to gain insight into their efforts towards northern pike habitat restoration (e.g. American Fisheries Society).
Northern pike	CPA-87	St. Lawrence	CPA & FEMRF	Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan.
Northern pike	CPA-88	St. Lawrence	CPA & FEMRF	Provide substantive comments on the following projects with the conservation of northern pike and their recovery as one of our foci: Massena Electric Development, Eel Weir Dam, Heuvelton Dam.
Northern pike	CPA-89	St. Lawrence	CPA & FEMRF	Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g. U.S. Army Corps of Engineers 404 permits, FERC relicensing, and license compliance work).
Northern pike	EC-38	St. Lawrence	EC	Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment Area of Concern to determine potential impacts to fish and wildlife Trust resources and their supporting habitats, with potential for including the St. Lawrence Area of Concern in subsequent years.
Northern pike	EC-39	St. Lawrence	EC	Coordinate with USEPA and Area of Concern Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources.
Northern pike	EC-40	St. Lawrence	EC	Manage St. Lawrence NRDA River case; consider northern pike restoration projects in settlement negotiations regarding the case.
Northern pike	FEMRF-15	St. Lawrence	FEMRF & CPA	Attend meetings with other organization/agencies to gain insight into their efforts towards northern pike habitat restoration (e.g. American Fisheries Society).
Northern pike	FEMRF-16	St. Lawrence	FEMRF & CPA	Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan.
Northern pike	FEMRF-17	St. Lawrence	FEMRF & CPA	Provide substantive comments on the following projects with the conservation of northern pike and their recovery as one of our foci: Massena Electric Development, Eel Weir Dam, Heuvelton Dam.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Northern pike	FEMRF-18	St. Lawrence	FEMRF & CPA	Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g. U.S. Army Corps of Engineers 404 permits, FERC relicensing, and license compliance work).
Northern pike	FEMRF-24	St. Lawrence	FEMRF & PFW	Assist landowners in identifying suitable habitat on their properties, threats to those habitats, and references for technical assistance in implementing habitat improvement projects.
Northern pike	FEMRF-25	St. Lawrence	FEMRF & PFW	Continue FEMRF efforts towards pursuing and funding sound proposals that would contribute to northern pike recovery.
Northern pike	FEMRF-26	St. Lawrence	FEMRF & PFW	Continue Fish Barrier Assessment & Mitigation project: mitigate significant barriers; work to obtain funding for Stream Habitat Survey/Fish Response project. FY2011 work on three stream systems: Barretts, Mullett, Brandy.
Northern pike	FEMRF-27	St. Lawrence	FEMRF & PFW	Initiate Stream Habitat Survey/Fish Response project proposal; working in conjunction with Fish Barrier Assessment & Mitigation project.
Northern pike	FEMRF-28	St. Lawrence	FEMRF & PFW	Participate in Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership.
Northern pike	FEMRF-29	St. Lawrence	FEMRF & PFW	Work with FEMRF funded contractors to determine marshes with highest potential.
Northern pike	PFW-45	St. Lawrence	PFW	Complete Blind Bay project: using amphibious excavator, construct sinuous channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat; create oxbow like sections of the new channels to encourage carex/juncus species diversity.
Northern pike	PFW-46	St. Lawrence	PFW	Continue work in French Creek marsh to open up mono-typical stand of typha to increased flow/provide access to the marsh by northern pike; for FY2011: 2,320 feet.
Northern pike	PFW-47	St. Lawrence	PFW	Coordinate efforts with other organizations/agencies to address habitat loss due to stabilized water levels which have allowed invasive cattail to form dense, monotypic stands with little habitat value.
Northern pike	PFW-48	St. Lawrence	PFW	Establish storylines and information on Regional and NYFO webpage, detailing projects and information for interested landowners and general public.
Northern pike	PFW-49	St. Lawrence	PFW	Monitor fish barrier removal effectiveness at Little Sucker Brook.
Northern pike	PFW-50	St. Lawrence	PFW	Promote/plan/fund marsh evaluations/public outreach.
Northern pike	PFW-51	St. Lawrence	PFW	Start work on Grindstone Island projects: Club Island – re-open channels connecting Flynn Bay with St. Lawrence River; Delaney Bay marsh – re-open historic channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat.



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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Northern pike	PFW-52	St. Lawrence	PFW	Work in conjunction with the NRCS and the local Soil and Water Conservation District to provide technical assistance on agricultural best management practices (BMPs), including cattle exclusion fencing and stream bank restoration in the watershed.
Northern pike	PFW-53	St. Lawrence	PFW	Work with Regional Office to establish media news release and fact sheet detailing projects and information for interested landowners and general public.
Northern pike	PFW-65	St. Lawrence	PFW & FEMRF	Assist landowners in identifying suitable habitat on their properties, threats to those habitats, and references for technical assistance in implementing habitat improvement projects.
Northern pike	PFW-66	St. Lawrence	PFW & FEMRF	Continue FEMRF efforts towards pursuing and funding sound proposals that would contribute to northern pike recovery.
Northern pike	PFW-67	St. Lawrence	PFW & FEMRF	Continue Fish Barrier Assessment & Mitigation project: mitigate significant barriers; work to obtain funding for Stream Habitat Survey/Fish Response project. FY2011 work on three stream systems: Barretts, Mullett, Brandy.
Northern pike	PFW-68	St. Lawrence	PFW & FEMRF	Initiate Stream Habitat Survey/Fish Response project proposal; working in conjunction with Fish Barrier Assessment & Mitigation project.
Northern pike	PFW-69	St. Lawrence	PFW & FEMRF	Participate in Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership.
Northern pike	PFW-70	St. Lawrence	PFW & FEMRF	Work with FEMRF funded contractors to determine marshes with highest potential.
Northern wild monkshood	ESA-96	Lower Hudson	ESA	Provide information to FWS Region 3 for annual RDC.
Piping plover	CPA-80	Great Lakes	CPA & ESA	Request surveys for this species prior to work done in critical habitat areas.
Piping plover	ESA-97	Great Lakes	ESA	Assist with 2011 International Census; coordinate NYFO involvement.
Piping plover	ESA-98	Great Lakes	ESA	Provide sighting information to Region 3 for annual RDC.
Piping plover	ESA-109	Great Lakes	ESA & CPA	Request surveys for this species prior to work done in critical habitat areas.
Piping plover	LIFO-1	Long Island	LIFO	As needed, work with Valley Stream office of LE to investigation alleged endangered species take incidents. Develop a work plan for a seasonal intern to undertake piping plover monitoring at Southampton and Huntington, NY in support of LE activities (contingent on funding).

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Piping plover	LIFO-2	Long Island	LIFO	Assess feasibility of a plan regarding feral cats on Cedar Beach Mount Sinai and other breeding sites within the Town of Brookhaven. Continue to participate in national teleconferences to develop USFWS guidance on feral cats; On Long Island obtain and gather information on feral cat colony locations; do outreach to local government to advise them about removal of colonies.
Piping plover	LIFO-3	Long Island	LIFO	Complete any intraservice consultations on removal of predators in breeding habitat.
Piping plover	LIFO-4	Long Island	LIFO	Provide cooperators piping plover equipment such as signs, predator exclosures, fencing and string for identified priority sites (as funding allows).
Piping plover	LIFO-5	Long Island	LIFO	Continue to lead ES efforts on review of GSA DEIS regarding the proposed disposition of Plum island animal research lab.
Piping plover	LIFO-6	Long Island	LIFO	Implement monitoring and management of piping plovers at select sites such as Sand City, Crab Meadow Beach, Breezy Point, West Hampton, Plum Island, Fishers Island, Centre Island, and Silver Point, between April 1 and September 1. Depending on availability and need, assist Long Island's east end towns with monitoring and management. This effort also includes cross-programmatic efforts with LINWR and FWS LE, coordination with cooperators, providing technical assistance, funding and supplies, and when available, outside funding from the Corps to hire a plover monitor for the Federal FI Inlet Navigation Project Area.
Piping plover	LIFO-7	Long Island	LIFO	As follow up to existing section 7 consultations with the National Park Service and Suffolk County Department of Parks, Recreation and Conservation, determine compliance with project commitments to undertake habitat restoration at Cupsogue County Park and Smith Point County Park.
Piping plover	LIFO-8	Long Island	LIFO	Conduct Long Island Colonial Waterbird and Piping Plover Surveys at Sand City, Centre Island, Tobay Marsh Islands, Silver Point, Crab Meadow Beach, Breezy Point, Fishers Island, and Plum Island. Assess piping plover use of mainland upland sand dredging disposal sites located at Roe and Grove Avenue in Patchogue by conducting periodic surveys.
Piping plover	LIFO-9	Long Island	LIFO	Hold two steward training sessions and work with LE to assess need for special training for LE agents from cooperating land managers.
Piping plover	LIFO-10	Long Island	LIFO	On a case by case basis, assess impacts of Corps and local government projects on coastal processes through section 7 consultation and section 10 permit review.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Piping plover	LIFO-11	Long Island	LIFO	Meet with Fire Island National Seashore Natural Resource Management to review results of 2010 , and plan for 2011, threatened and endangered species monitoring and protection efforts within the Seashore.
Piping plover	LIFO-12	Long Island	LIFO	Provide technical assistance on appropriate conservation measures e.g. TOY restrictions to avoid and minimize adverse effects relative to Corps of Engineers and Coast Guard permit, planning and operations decisions.
Piping plover	LIFO-13	Long Island	LIFO	As requested, undertake section 7 consultation with FEMA for emergency disaster declaration projects.
Piping plover	LIFO-14	Long Island	LIFO	Work with NYSOPRHP on a conservation strategy to address long term conflicts between recreational uses of barrier beaches and listed species habitat protection and avoidance of adverse effects/take; meet with NYSOPRHP; meet with RO and HCP experts; convene a workshop re. HCP process.
Rayed bean	ESA-99	Allegheny	ESA	Review proposed rule to list rayed bean as endangered.
Rayed bean	ESA-100	Allegheny	ESA	Conduct outreach to NY interested parties for proposed rule to list rayed bean as endangered.
Rayed bean	ESA-101	Allegheny	ESA	Map known mussel populations.
Red knot	LIFO-15	Long Island	LIFO	Coordinate with Federal, state, and local regulatory and land use agencies on measures that could minimize impacts to horseshoe crab and red knot habitat, including the Plumb Beach Shoreline Protection Project.
Roseate tern	LIFO-16	Long Island	LIFO	Continue to fund AMNH Great Gull monitoring and management of common tern and roseate tern colony at Great Gull.
Roseate tern	LIFO-17	Long Island	LIFO	Continue to support Town of Brookhaven project at New Made Island with installation and broadcasting breeding calls to attract roseate and common terns.
Roseate tern	LIFO-18	Long Island	LIFO	If needed, assist in funding predator control on Great Gull Island.
Roseate tern	LIFO-19	Long Island	LIFO	In cooperation with NWR, plan vegetation removal maintenance at New Made Island.
Roseate tern	LIFO-20	Long Island	LIFO	Participate in ROTE recovery meeting in RI end of November.
Roseate tern	LIFO-21	Long Island	LIFO	Provide technical assistance to Breezy Point Coop, and other sites as needed, for common, least and ROTE nesting habitat protection.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Saltmarsh sharp-tailed sparrow	LIFO-22	Long Island	LIFO	In 2010, convene a teleconference with University of Maine to identify survey protocols for saltmarsh sharp-tailed sparrows that will be incorporated into a Long Island census of sparrow populations at the following sites: Gardiner County Park, Long Cove FIIS, NYSDEC Fireplace Neck wetlands, TNC Pine Neck Marsh and Wading River Marsh, Town of Hempstead Oceanside Marine Sanctuary and North Cinder Island, and NYC Department of Parks wetlands near JFK and Jamaica Bay. .
Saltmarsh sharp-tailed sparrow	LIFO-23	Long Island	LIFO	In 2010, initiate a status assessment for saltmarsh sharp-tailed sparrow. Coordinate one meeting of interested parties to discuss population objectives and sampling methodology for saltmarsh sharp-tailed sparrows on Long Island.
Saltmarsh sharp-tailed sparrow	LIFO-24	Long Island	LIFO	Participate in the annual two day survey of USGS Breeding Bird Survey routes (Hauppauge and Huntington routes).
Saltmarsh sharp-tailed sparrow	LIFO-25	Long Island	LIFO	Determine the feasibility of developing a monitoring network, similar to the Long Island Colonial Waterbird and Piping Plover survey program, that could undertake coordinated sampling for this and other species, by hold a meeting with the NYSDEC and other principal partners.
Sandplain gerardia	LIFO-26	Long Island	LIFO	Assist TNC and LINWR in managing suitable habitat in Sayville and TNC properties.
Sandplain gerardia	LIFO-27	Long Island	LIFO	Meet with Service personnel at FWS Region 5 Biologist Conference (Feb. 2011) to agree upon a strategy to address <i>A. acuta</i> taxon now being <i>A. decemloba</i> and the associated de-listing and possible re-listing. In coordination with FWS Raleigh North Carolina Field Office, initiate efforts to determine <i>A. decemloba</i> range/distribution/abundance in southern states. Identify stakeholders and assign tasks.
Seabeach amaranth	LIFO-28	Long Island	LIFO	Conduct species surveys at Breezy Point, Westhampton Dunes. Assist in surveys throughout Long Island as needed.
Seabeach amaranth	LIFO-29	Long Island	LIFO	Establish symbolic fencing; actively manage & protect habitat for plovers and seabeach amaranth at Breezy Point Co-op and Village of Westhampton Dunes, and provide recommendations to land managers regarding protection of amaranth along the south shore of Long Island. Assist in installation of symbolic fencing as needed.
Seabeach amaranth	LIFO-30	Long Island	LIFO	Maintain Long Island-wide database on species abundance and convey to Dale Souter, Wendy Walsh.
Small whorled pogonia	ESA-102	Lower Hudson	ESA	Apply for Showing Success grant for surveys.

APPENDIX 5: NYFO/LIFO Action Items BY SPECIES

SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
Small whorled pogonia	ESA-103	Lower Hudson	ESA	Assist with surveys of the known population in order to determine population size and reproductive effort over three years and assess population viability.
Small whorled pogonia	ESA-104	Lower Hudson	ESA	Coordinate with NYSOPRHP with regard to the location of recreation developments near small whorled pogonia.
Small whorled pogonia	ESA-105	Lower Hudson	ESA	Participate in a NYS small whorled pogonia working group with species partners in order to coordinate efforts and resources.
Small whorled pogonia	ESA-114	Lower Hudson	ESA & IT	Construct small whorled pogonia web page for the NYFO site, linking to NEFO as needed.
Small whorled pogonia	IT-11	Lower Hudson	IT & ES	Construct small whorled pogonia web page for the NYFO site, linking to NEFO as needed.
Spotted darter	CPA-71	Allegheny	CPA	Work on culvert design criteria as a member of the New York Culvert Working Group.
Spotted darter	CPA-72	Allegheny	CPA	Provide substantive comments on proposed Federal agency actions with likely adverse impacts on spotted darter, including natural gas/oil extraction.
Winter flounder	EC-41	Long Island	EC	Coordinate Gowanus Canal BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA.
Winter flounder	LIFO-31	Long Island	LIFO	Consult with U.S. Army Corps of Engineers/federal action agencies that authorize, fund or undertake actions (power plants, tidal power projects) which could entrain/impinge winter flounder and provide recommendations/conservation measures to avoid/minimize or compensate for these impacts.
Winter flounder	LIFO-32	Long Island	LIFO	When reviewing Section 10/404 permit applications, recommend conservation measures that avoid, minimize or compensate for impacts associated with channeling and/or bulkheading of nearshore habitats.
Winter flounder	LIFO-33	Long Island	LIFO	When reviewing Section 10/404 permit applications, recommend time of year restrictions so that dredging activities which increase suspended sediment concentrations, do not occur during winter flounder spawning (generally October-March, coordinate with NYSDEC to confirm).
Winter flounder	LIFO-34	Long Island	LIFO	When reviewing Section 10/404 permit applications, recommend use of non-toxic materials for in-water structures such as bulkheads, piers, pilings and boat lifts.

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SPECIES	ID	FOCAL AREA	PROGRAM	ITEM
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Note: Species with no action items for FY2011: clubshell