May 30, 2014

<u>Handout for Terrestrial Subteam – Connecticut River Watershed Pilot</u>

**Connecticut River Watershed Landscape Conservation Design Pilot:
Suggestions for Setting Population Objectives**

As the first steps in any conservation planning process, it is important to:
1. Identify the features or elements, including species of wildlife, fish, and plants, that are a focus of the conservation design.
2. Agree upon desired outcomes for those features in the geography.

In the case of species, the desired outcomes are typically expressed as population objectives such as abundance, trend, or other measurable indices of population status. Such objectives can then be translated to population-based habitat objectives. Explicit population objectives serve as an essential foundation for deciding what conservation actions are needed where and for measuring progress toward goals.  A population objective is defined here as "a measurable expression of a desired biological outcome for a species of fish, wildlife, or plant."

<u>Considerations in Setting Population Objectives for the CT River Pilot Project</u>
As background for these suggestions for setting population objectives, the following considerations are relevant to the Pilot given the planned timeline and current state of information and tools for the Connecticut River watershed:

- Because overall goals and population objectives are "desired outcomes," setting objectives is fundamentally a value-based decision. How habitat is to be conserved and managed to achieve population objectives must be balanced among multiple possible societal desires for how land is used and how funding is allocated, including for uses (development and infrastructure) that may conflict with conservation.
- Population objectives should be expressed in metrics and with a degree of precision that match the available methods and data for estimating such population metrics. They also should include a clear timeframe during or by which they are to be achieved (e.g., 10 or 25 years into the future). Because methods and data availability differ among species, population objectives likewise may need to be expressed differently.
- The process of setting population objectives should be informed by the best available information and tools and be iterative. Conservation design will involve taking into account the population objectives of multiple species simultaneously (along with objectives for other endpoints); decisions about how to weight current status versus projected future landscape condition and climate; and potentially how much of the landscape to prioritize for conservation. All of these decisions could affect the feasibility of the initial population objectives.

<u>Existing population objectives</u>
The availability and nature of existing population objectives vary among species. One important source for the Pilot effort is the set of continental population objectives for landbirds in the *Partners in Flight North American Landbird Conservation Plan* (2004). The stated conservation goal in that document is to "sustain healthy, genetically diverse populations of birds, well distributed across their current ranges." For designated priority species, they assigned species to one of four population objective categories based on long-term trends:
1) Double population (for species that have undergone the steepest declines)
2) Increase population by 50% (for species that have undergone more moderate declines)

3) Maintain/increase population (for species with uncertain population trends)
4) Maintain population (for species with stable or increasing population trends)

This continental plan is complemented by plans for "Bird Conservation Regions" (BCRs), which represent ecoregions. Two BCRs overlap the Connecticut River watershed: Atlantic Northern Forest (BCR 14), which encompasses all of the VT and NH portions of the watershed and roughly half of the MA portion, and New England/Maritime Coast (BCR 30), which encompasses most of the remainder.  In addition to the Partners in Flight plan, continental-level conservation plans also have been developed for the American Woodcock and Ruffed Grouse.

The table on the following page (Table 2) summarizes the population objectives at continental and BCR-scale from the previously mentioned bird conservation plans, presents information on populations trends, % of the population in the Northeast and the 4 state area around the Connecticut River, a suggested objective for the Connecticut River Watershed as a starting point for further discussion, and some additional notes about these species.  Note that population increases are suggested for several species, but an exact amount has not been suggested – we are seeking feedback on what that amount should be. The table considers the first 10 bird species for which habitat capability models are being completed for the full Northeast in the *Designing Sustainable Landscapes* project led by UMass Amherst. Note that both BCRs encompass much larger areas than the Connecticut River watershed. These species were selected to represent major ecosystem types and associated wildlife species.

We are not aware of continental or regional population objectives for the other three species currently being modeled in the *Designing Sustainable Landscapes* project (black bear, moose, wood turtle), although we have received some feedback (with more expected) from the States on particular objectives for these species. **At this time**, we **suggest a population objective of maintaining** the current abundance and distribution of these three species:

Table 1.  Suggested population and habitat objectives for mammal and reptile representative species.

| Species | State Objectives | Suggested population objective (by 2030) for the Connecticut River Watershed | Suggested habitat objective (by 2030) for the Watershed^ | Comments |
|---|---|---|---|---|
| Black Bear | VT: maintain wild, free-ranging, viable populations of black bear | Maintain existing population level and approximate distribution throughout the Watershed | Maintain existing habitat | For VT: a conservation goal of conserving a connected network of large forest blocks representing all forest types and natural communities and successional stages to support bear, moose, grouse. SCGN for CT, MA, VT |
| Moose | VT: statewide population of 3,000 to 5,000 moose | Maintain existing population level and approximate distribution throughout the Watershed | Maintain existing habitat | SCGN for MA |
| Wood Turtle | No state-level objectives reported | Maintain existing population level and approximate distribution throughout the Watershed | Maintain existing habitat | SCGN for CT, MA, VT |

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Table 2. Suggested population and habitat objectives for avian representative species.

| Species | Continental objective (continental trend^^) | BCR 14 objective (BCR 14 trend^^) | BCR 30 objective (BCR 30 trend^^) | % of population in the Northeast region; % in the 4 states of the CT River (CT, MA, NH, VT) | Suggested population objective (by 2030) for the Connecticut River Watershed | Suggested habitat objective (by 2030) for the CT River Watershed^ | Comments |
|---|---|---|---|---|---|---|---|
| American Woodcock* | 50% increase (-1.8%) | 50% increase (-0.4%) | 50% increase (-4.9%) | 17%, 3% | Increase 50% | Increase existing *Landscape Capability* by 50% | Early successional habitat in CTR Watershed likely at or below historic lows |
| Blackburnian Warbler | Maintain (0.1%) | Maintain (0.4%) | Maintain (-1.4%) | 15%, 3% | Maintain | Maintain existing habitat | |
| Blackpoll Warbler | No objective (-6.7%) | No objective (-4.5%) | X (generally does not breed in BCR 30) | ??, ?? relatively small % | Maintain | Maintain existing habitat | Mountain Bird Watch program indicated an annual trend from 2001-2010 of -0.7% for this species |
| Eastern Meadowlark | No objective (-3.4%) | Increase 50% (-6.7%) | Increase 100% (-6.9%) | 3%, 0.1% | Increase 50% | Increase existing *Landscape Capability* by 50% | |
| Louisiana Waterthrush | Maintain (0.4%) | No objective (-1.0%) | Maintain (0.1%) | 33%, 2% | Maintain | Maintain existing habitat | |
| Marsh Wren | No objective (2.0%) | No objective (1.6%) | Maintain (-1.6%) | 1%, 0.4% | Maintain | Maintain existing habitat | |

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| Northern Waterthrush | No objective (0.5%) | No objective (-1.2%) | No objective (-1.0%) | 0.3%, 0.05% | Maintain | Maintain existing habitat | |
| Ruffed Grouse** | Maintain (-0.4%) | Maintain (0.2%) | Increase 5% (-0.5%) | ??, ?? | Maintain | Maintain existing habitat | |
| Wood Duck | Maintain (2.0%) | Maintain (3.0%) | Maintain (1.0%) | ??, ?? | Maintain | Maintain existing habitat | |
| Wood Thrush | 50% increase (-2.1%) | 50% Increase (-4.6%) | 50% increase (-2.8%) | 30%, 4% | Increase 50% | Maintain existing habitat | Likely not limited by breeding habitat in CTR Watershed |

^ Habitat objectives will be quantified by the combined total *Landscape Capability* for each species within the Watershed.

^^ Trend is presented as % change per year; for passerines the number represents the long-term trend from 1966-2012 as measured by the Breeding Bird Survey; for woodcock, the number represents the longer-term trend from 1968-2006.

* The American Woodcock Conservation Plan (2008) recommends a return to woodcock densities that were observed during the early 1970s, which represents about a 50% increase.

** The Ruffed Grouse Conservation Plan (2006) recommends a return or maintenance of ruffed grouse densities that were observed during the early 1980s.


Table 3. Suggested population and habitat objectives for rare or under-represented species.

| Species | Suggested population objective (by 2030) for the Connecticut River Watershed | Suggested habitat objective (by 2030) for the Watershed^ | Comments |
|---|---|---|---|
| Bats | Maintain existing population level and approximate distribution throughout the Watershed | Maintain existing habitat | Bats will be represented through hiberacula site and possibly known locations of a representative bat species |
| Puritan and Cobblestone Tiger Beetles | Maintain existing population level and approximate distribution throughout the Watershed | Maintain existing habitat | Beetles will be represented by known locations of extant populations and specific habitat for these species |
| New England Cottontail | Increase existing population level and distribution as indicated in NEC conservation plan | Increase existing habitat as indicated in NEC conservation plan | NEC will be included in the overall landscape design through priority focal areas identified in the NEC conservation plan |

Table 4. Additional information for consideration for weighting among representative species, establishing core area tiers for landscape design, and identifying conservation strategies, monitoring needs and research needs.

| Species | Population Limiting Factors Operating Within and Outside Watershed | Life Cycle Contribution for CT River Watershed | Population Objective for CT River Watershed | Threshold Percent (%) of Landscape Capability in Core Area Tiers | Additional Habitat Needed to Meet Population Objective | Habitat Conservation Strategies to Achieve Objectives | Current Monitoring Strategies to Evaluate Objectives | Additional Monitoring Strategies Needed to Evaluate Objectives | Research Needs* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| American Woodcock | Within: Amount of suitable breeding habitat<br><br>Outside: non-breeding survival | Breeding, Migration | Increase population by 50% | Suggestion for further discussion:<br><br>Tier 1 = 50%<br><br>Tier 2 = 70% | Xxxx acres of early successional habitat throughout the Watershed; outside core areas for interior forest species but potentially within buffers and corridors | 1) Protect 2) Manage 3) Restore/ Create | Singing Ground Survey; hunter harvest surveys | More Singing Ground Surveys | Test hypothesis that woodcock are limited by breeding habitat vs non-breeding survival |
| Blackburnian Warbler | Within: ?? Outside: non-breeding survival | Breeding, Migration | Maintain population | Tier 3 = 90% | | 1) Protect | BBS routes in Watershed | Additional BBS routes in Watershed? | More information on limiting factors |
| Blackpoll Warbler | Within: *climate change* Outside: non-breeding survival | Breeding, Migration | Maintain population | | | 1 ) Protect | BBS routes in Watershed | Additional BBS routes in Watershed? | More information on limiting factors |

| Species | Limiting Factors | Seasons | Goal | | Habitat Objectives | Strategies | Monitoring | Research Needs | Additional Needs |
|---|---|---|---|---|---|---|---|---|---|
| Eastern Meadowlark | Within: Amount of suitable breeding habitat, nesting success, post-fledging survival Outside: non-breeding survival | Breeding, Migration, Limited Wintering | Increase population by 50% | | Xxxx acres of additional nesting grassland habitat focused in lower Watershed within landscapes with high % agriculture; Xxxx acres of existing nesting grassland habitat with improved management | 1) Protect 2) Manage 3) Restore/ Create | BBS routes in Watershed | Additional BBS routes in Watershed? | |
| Louisiana Waterthrush | Within: post-fledging survival? Outside: non-breeding survival? | Breeding, Migration | Maintain population | | | 1) Protect | BBS routes in Watershed | Additional BBS routes in Watershed? | More information on limiting factors |
| Marsh Wren | Insufficient information | Breeding, Migration | Maintain population | | | 1) Protect | BBS routes in Watershed | Additional BBS routes in Watershed? | More information on limiting factors |
| Northern Waterthrush | Insufficient information | Breeding, Migration | Maintain population | | | 1) Protect | BBS routes in Watershed | Additional BBS routes in Watershed? | More information on limiting factors |
| Ruffed Grouse | Within: Amount of suitable habitat?? | Year-round | Maintain population | | | 1) Protect 2) Manage | BBS routes in Watershed | Additional BBS routes in Watershed? | More information on limiting factors |

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| Wood Duck | Within: nest site availability??, hunting?? | Year-round | Maintain population | | | 1) Protect | Waterfowl Breeding Plot Surveys, hunter harvest surveys | Additional Waterfowl Breeding Plot surveys in Watershed? | More information on limiting factors and whether nest sites are limiting within Watershed |
| Wood Thrush | Within: possibly breeding productivity within lower portion of Watershed? Outside: non-breeding survival | Breeding, Migration | Increase population by 50% | | Additional acres of breeding habitat might not be needed to support a larger breeding population if breeding habitat is not limited; Xxxx acres might need to be managed to improve breeding productivity | 1) Protect 2) Manage | BBS routes in Watershed | Additional BBS routes in Watershed? | Test whether breeding habitat is currently limiting within Watershed; more information on limiting factors |
| Wood Turtle | Within: road mortality, nest predation, habitat availability | Year-round | Maintain population | | | 1) Protect | ?? | | more information on abundance, distribution and limiting factors |

| Black Bear | | Year-round | Maintain population | | | 1) Protect | State-level monitoring | | |
|---|---|---|---|---|---|---|---|---|---|
| Moose | | Year-round | Maintain population | | | 1) Protect | State-level monitoring | | |
| Bats | Within: disease Outside: ?? | Breeding, Migration | Maintain population | | | 1) Protect | | | |
| Beetles | ?? | Year-round | Maintain population | | | 1) Protect | | | |
| New England Cottontail | Within: amount of suitable habitat, inter-specific competition | Year-round | Increase population (see NEC conserv. plan) | | | 1) Protect 2) Manage 3) Restore/ Create | | | |

\* Over-arching research need: test assumption on relationship of Landscape Capability to species metrics (density, breeding productivity); null hypothesis = linear relationship between Landscape Capability and species density.