

The significance of various threats to UTRB imperiled aquatic species vary depending upon level of imperilment and where the species are distributed across the basin's three major physiographic provinces (Figure 1). Species inhabiting the Appalachian Plateau, which contains all of the coal fields and most of the oil and natural gas deposits in the UTRB, and those inhabiting receiving streams in the Ridge and Valley, are experiencing threats from energy extraction activities. Most residential development, transportation corridor construction, and other urbanization effects occur in the flatter, valley portions of the Ridge and Valley. Timbering, stream impoundment, and agriculture are dispersed more broadly across all three provinces.

## Assumptions and Terminology

Definitions specific to this Strategy are found in Appendix 4. During development of the Strategy, the following assumptions and terminology were used:

- Species federally listed as endangered or threatened, species proposed for Federal listing as endangered or threatened, and candidate species are considered imperiled species to the exclusion of other rare species in the UTRB.
- Common and/or scientific names currently accepted in scientific literature are used, but are not necessarily the common and/or scientific names under which the species were listed pursuant to the ESA. For example, the duskytail darter, *Etheostoma percnurum*, is the federally listed taxon. However, since its Federal designation, a taxonomic study was published splitting the species into four taxa (Blanton and Jenkins 2008). Three of these (duskytail, marbled, and Citico darters; Tables 1 and 2, Appendices 1 and 2) are endemic to the UTRB. Similarly, the golden riffleshell, *Epioblasma florentina aureola*, was recently determined to be a subspecies taxonomically distinct from the federally listed tan riffleshell, *Epioblasma florentina walkeri* (Jones and Neves 2010). Currently, *E. f. aureola* is globally restricted to the UTRB. No formal Federal actions have been undertaken to recognize these taxonomic revisions.
- Populations of fishes and mussels are generally considered extant (currently existing) if living individuals or fresh dead specimens (for mussels) have been collected since 1980.

## Strategy Development

Through a series of meetings, workshops, conference calls, webinars, and emails that took place from August 2011 through March 2014, SDM was used to develop and evaluate conservation strategies intended to increase persistence of imperiled aquatic species in the UTRB. The application of SDM to natural resource management is increasing, as its utility for assisting decision making in the face of competing objectives and uncertainty is being documented (Gregory and Long 2009, Martin et al. 2011, Gregory et al. 2012, Gregory et al. 2013, Conroy and Peterson 2013). SDM is values-focused and deconstructs the decision problem into universally recognizable components that can be deliberated by stakeholders, resource experts, and analysts. Transparency and explicitness are hallmarks of SDM. Identification of fundamental objectives is the first component considered after the problem is defined and framed. Development of alternatives follows identification of objectives. Optimal solutions can be found by evaluating the alternative management actions or strategies that best meet the objectives.