April 17, 2014

Handout 2 for Terrestrial Subteam – Connecticut River Watershed Pilot

How Representative Species were Chosen for Modeling

Over the past three years, the U.S. Fish and Wildlife Service and the North Atlantic Landscape Conservation Cooperative have worked to select and support the development of habitat models for a set of species referred to as "representative" species. A representative species (also known as a "surrogate" species) is one that, because of its habitat use, ecosystem function, or management response typifies lifecycle or habitat requirements for a larger group of species. Collectively, the representative species selected to date are intended to represent the needs of a broad set of fish and wildlife occurring in the Northeastern U.S. Because it is not possible to individually assess the habitat needs of all fish and wildlife species, representative species have the potential to serve a valuable role in prioritizing conservation, management, and restoration of habitat through the process of conservation design.

U.S. FWS Criteria for Selecting Representative Species

In 2011, a total of 87 species representing (primarily) terrestrial and wetland habitats were selected at a series of three workshops organized by the Northeast Region of the U.S. FWS. The species were drawn from a list of several hundred candidate wildlife species consisting of Federal Trust Species (migratory birds, threatened and endangered species) and Species of Greatest Conservation Need identified by at least six states in the region. The experts also added a few additional species not originally considered, mainly reptiles and amphibians. A cluster analysis by UMass Amherst that organized species into a set of ecosystem (habitat) and species groups served as a starting point for consideration by the experts. The following criteria were considered by experts in selecting the species at the workshops:

1. Species collectively occur over a large geographic area in the North Atlantic LCC region and represent a wide range of habitat types.
2. Species help in understanding the effects of climate change and other stressors, through sensitivity to landscape and climate change.
3. Species can be effectively monitored.
4. Population/habitat objectives can be feasibly developed.
5. Baseline data on species-habitat associations, ecological processes and other limiting factors are available.
6. Species are useful for guiding conservation management decisions.

Criteria for Selecting Representative Species for Modeling

North Atlantic LCC staff, in consultation with U.S. FWS staff and the modeling team at UMass Amherst, then selected which of the representative species to model first in the Designing Sustainable Landscapes project. This resulted in 10 species being selected during Phase 1 of the project and 20 more species[1] during Phase 2. The criteria used for selecting the species were

[1] More precisely, 20 species models for 19 species; two separate models are in development for black duck, one for breeding and one for nonbreeding

similar to those used at the workshop but also included sequencing criteria to help stage the work. The criteria included:

- Begin with species that represent large, matrix habitats and proceed in the selection to ensure that all major habitat types (and associated species) are represented.
- If necessary, select species representing different major forms or structural types of ecosystems (e.g., young forest species and mature forest species)
- Begin with species that are wide-ranging (span all three subregions of the North Atlantic LCC geography).
- Select species with substantial habitat-relationship data, evaluations, and available monitoring data.
- Select species that collectively represent multiple taxonomic groupings and life history characteristics. Specifically, ensure that some selected species are:
    - Dispersal-limited and sensitive to habitat fragmentation (e.g., reptiles)
    - Wide-ranging, requiring large areas of intact habitat (e.g., large mammals)
- Select some species that are widely appreciated and recognized by the conservation community and the public, if they otherwise meet the criteria for selecting species.

During Phase 1 of the project, application of the criteria resulted in the selection of

- 5 species of deciduous or deciduous-mixed forest (all birds), which is by far the dominant natural ecosystem of the Northeast
- 2 species of forested wetlands and rivers (1 bird, 1 reptile)
- 1 spruce-fir forest species (bird)
- 1 pine forest species (bird)
- 1 freshwater marsh species (bird)

The complete set of 30 species models for Phase 2 included:

- 11 species of deciduous or deciduous-mixed forest (9 birds, 1 reptile, 1 mammal)
- 3 species of forested wetlands and rivers (2 bird, 1 reptile)
- 4 spruce-fir forest species (2 birds, 2 mammals)
- 1 pine forest species (bird)
- 3 freshwater marsh species (all birds)
- 1 grassland species (bird)
- 4 saltmarsh and estuarine species (3 birds, 1 reptile)
- 2 beach species (birds)
- 1 lake species (bird)

Three of the species being modeled (black bear, moose, and snowshoe hare) were not among the original 87 selected as representative species by the U.S.FWS. Black bear and moose were chosen to better reflect the habitat needs of wildlife species requiring large home ranges. Snowshoe hare was selected to represent young spruce-fir forests and the other species that use this ecosystem type. Handout 2 provides the full list of the 28 terrestrial and wetland species being modeled that occur in the Connecticut River Watershed.