Potential Criteria for Weighting Ecological Systems

**Background and Purpose**

The Connecticut River Watershed Pilot is developing a Landscape Conservation Design that entails a spatial plan for conservation action. As currently conceived, the spatial plan will categorize or rank locations in the watershed to indicate the collective priorities of partners in sustaining a diverse suite of ecosystems and populations of fish and wildlife. A number of factors can be applied in determining which locations are considered to be of highest priority. In the case of ecosystems, one factor that can be considered is the “Index of Ecological Integrity” (IEI) developed by UMass Amherst. This index assesses the intactness and resiliency of the “ecological systems”[[1]](#footnote-1) mapped by The Nature Conservancy across the Northeast. Furthermore, partners have the option of designating particular ecological systems, or groups of ecological systems (called “macrogroups”), as being of inherently higher priority for conservation. To incorporate this prioritization, weights are assigned to each system. Weights are numbers that indicate the relative likelihood that ecological systems will be selected in the highest tier of prioritization (i.e., a “core area”).

**Preliminary Criteria for Weighting Ecological Systems**

On April 25, 2014, the terrestrial subteam of the Connecticut River Watershed Pilot considered weighting the terrestrial and wetland ecological systems that occur in the watershed. While the team did not formally adopt a set of criteria for weighting systems, the following considerations emerged from the discussion:

* Ecological systems that have experienced significant historical losses (e.g., past 50 years) are candidates for elevated weights. Wetland systems were cited as examples.
* Ecological systems that are rare and unique – not just within the watershed, but at a larger scale – are candidates for elevated weights. Alpine systems were cited as examples.
* Ecological systems that are particularly important in terms of the species they support or functions and services they provide are candidates for elevated weights. Calcareous outcrops were cited as examples.
* Ecological systems for which the Connecticut River watershed is particularly important within the Northeast region (or at even larger scales, including global), suggesting a high responsibility for conservation action within the watershed.

*Current protected status.* The group discussed whether the degree of current protection (e.g., occurrence in a state park) should be a consideration in weighting. The sense of the group was that the focus of weighting should be on the ecological value independent of the current protected status, and that protected status could be considered during an implementation phase. A point in support of this position was that the conservation design would be most logically consistent and understandable if it expressed the collective conservation priority of the partnership. Furthermore, nominally protected areas could face future threats, so confirmation of their conservation importance could help secure their continued protected status.

*Future vulnerability.* The group also briefly discussed how to consider future vulnerability, e.g., to climate change, in establishing weights. Depending on one’s perspective and time horizon of interest, a predicted high degree of vulnerability could lead one to either place a higher weight on a system or to take a triage approach and assign a lower weight. Further discussion on this topic may be warranted. Case-by-case considerations may be needed to consider factors such as the degree of uncertainty in vulnerability and the potential for management to increase resiliency or allow for adaptation.

**Preliminary Selection of Weights for Ecological Systems**

During its discussion on April 25, the terrestrial subteam suggested assigning higher weights for the following ecological systems or macrogroups (see pilot webpage for the table with the full list of macrogroups and ecological systems):

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| **Ecological System or Macrogroup** | **Rationale** |
| Acadian-Appalachian Alpine Tundra | Rare and unique system of high regional importance |
| Laurentian-Acadian Calcareous Cliff and Talus | Supports rich community of unique plant species |
| Laurentian-Acadian Calcareous Rocky Outcrop | Supports rich community of unique plant species |
| Coastal Grassland and Shrubland (includes dunes and beaches) | Unique and vulnerable systems that support rare and high priority species |
| Boreal Upland Forest (3 systems) | vulnerability? |
| Northeastern Interior Pine Barrens | Rare system that supports a community of rare species |
| Laurentian-Acadian Floodplain Forest | Historically vulnerable system that performs important ecological functions |
| Northern Swamp – large river floodplain variants | Historically vulnerable system that performs important ecological functions |
| Laurentian-Acadian Freshwater Marsh | Historically vulnerable system that performs important ecological functions |
| Laurentian-Acadian Wet Meadow-Shrub Swamp | Historically vulnerable system that performs important ecological functions |
| Northern Peatland and Fens | Rare system in the watershed that supports unique species |

1. *Ecological systems* are recurring groups of biological communities found in similar environments at scales from tens to thousands of acres and typically persisting for 50 or more years. Examples of the more than 100 mapped systems include “Acadian-Appalachian Montane Spruce-Fir Forest” and “Northern Atlantic Coastal Plain Tidal Salt Marsh.” [↑](#footnote-ref-1)