

THEMATIC AREA:
WETLANDS

MISSION: *[LCC Staff Comment: No mission statement has been suggested or developed by this COP.]*

[Science objective] To inventory significant regional wetland habitats, evaluate the condition and importance of these habitats, and identify regional threats impacting those resources.

[Management objective] So that LCC partners and stakeholders can develop and implement cohesive regional management strategies to protect and manage wetlands across jurisdictions.

A. HEADING: REGIONAL LEVEL

1. PROGRAM: Landscape-level Disturbances & System-level Response

Examines major disturbances (includes climate change) as well as the impacts associated with these, regardless of ecological organization (e.g., community, species, population).

(Grouping) – Foundational/Stock-taking Assessment/Classification System

(Grouping) – Climate Change Science and Abiotic or Mechanical Aspects

(Grouping) – Climate Change Impacts on Ecological Function and Response to Changes

- **Project Description:** [S] Model effects of climate change on wetland habitats and species. Identify wetlands vulnerability to climate change and understand the impacts of climate change on the spatial distribution and quality of ephemeral wetlands and further understanding how those changes (earlier drying, loss of small wetlands, etc.) might impact biota, especially amphibians relying on ephemeral wetlands. *[COP Comment: Consider using the presence of rare plants or animals as criteria for determining vulnerability.]*
- **Project Description:** Establish wetland IBI(s) for the entire LCC as critical to being able to do landscape functional assessment leading to ecosystem service valuation. This would form a baseline from which to we could model/measure effects of climate change, hopefully leading to thresholds and adaptation strategies.

(Grouping) – Energy and Related Infrastructure and Roads

(Grouping) – Urbanization, Population Growth and (Domestic or Industrial) Water Demands

(Grouping) – *Agricultural Expansion and (Ag-related) Water Demands*

(Grouping) – *Effects of Air Pollution*

(Grouping) – *Cumulative Impacts*

- **Project Description: [S]** Rank the impacts of various managed land uses to all wetland communities/ecosystems, including naturally functioning floodplains.
 - o **(related) Project Description: [S]** Identify and quantify effects of urbanization and impervious surfaces on the viability of vernal pools.
 - o **(related) Project Description:** Understand impacts of surrounding land use to the quality and viability of ephemeral wetlands, including vernal pools, seeps, etc.

B. HEADING: HUMAN DIMENSIONS

2. PROGRAM: Social Component

[No specific Projects articulated by COP.]

(Grouping) – *Value/Ecosystem Services and Conflict*

(Grouping) – *Recreational, Commercial, Subsistence Use*

C. HEADING: SYSTEM LEVEL

3. PROGRAM: Ecological Functions of Managed/Human-Altered Systems

(Grouping) – *Foundational/Stock-taking Assessment/Classification System*

- **Project Description: [S]** Determine current extent of wetland connectivity to perennial streams compared to historical connectivity. *[COP Comment: Could be stepped-down to a set of priority watersheds within AppLCC (i.e., those currently supporting good populations of priority/rare/ listed aquatic species).]*
- **Project Description: [S]** Develop wetland Index of Biological Integrity for Appalachian LCC region. *[COP Comments: How about customizing a rapid wetlands assessment protocol (as has been done for TN, Ohio (ORAM – Ohio Rapid Assessment Method) to help identify ecologically important wetlands in the ALCC area? IBIs may not be something that can be done LCC-wide; would have to concentrate on smaller geographical areas due to the large differences in biological communities within our LCC.]*

(Grouping) – *Barriers (flows and species movement)*

(Grouping) – *Mitigating Ag and Forestry Impacts*

(Grouping) – *Protection & Restoration Approaches*

- **Project Description:** [S] Identify wetland persistence as it relates to habitat fragmentation.
 - **(related) Project Description:** Identify areas for bog restoration by first better understanding individual wetland/bog/fen hydrology.
- **Project Description:** [S] Develop restoration of hyporheic exchange (subsurface flow) techniques to connect wetlands to perennial streams.
- **Project Description:** [S] Evaluate success of created or restored wetlands in Appalachia; may be facilitated through review of existing data sources.

4. PROGRAM: Ecological Functions of Natural/Intact Systems

PROGRAM DESCRIPTION: *Determine how these systems are supposed to work; understand the systems and how they are inter-related and dependent.*

(Grouping) – *Foundational/Stock-taking Assessment/Classification System*

- **Project Description:** Identify and quantify the extent of naturally functioning floodplain habitat to support priority habitat and species.

(Grouping) – *Effects of Fire on Ecosystems*

(Grouping) – *Relationship/Ecological Flows and Nutrient Dynamics*

- **Project Description:** Quantify ecosystem services of wetlands and their contribution to nutrient cycling to both aquatic and terrestrial systems. [COP Comment: *This sounds like work that has already been completed in many wetland systems – it is not clear what new information is needed and this would need to be determined.*]
- **Project Description:** [S] Use of groundwater and effects on wetland hydrology. [COP Comment: *Needs more work. Is this intended to be a GIS exercise that identifies where areas are/will be projected to have groundwater use impacts to wetland hydrology (and therefore stream flow, etc.)? Do you mean “consumptive” use of GW?*]

(Grouping) – *Ecosystem Integrity/Resiliency*

- **Project Description:** [S] Determine how and if conversion of wetland types effects ecosystem services associated with aquatic species.

D. HEADING: COMMUNITY LEVEL

5. PROGRAM: Community Level (Description and Function or Basic Community Ecology)

(Grouping) – *Basic Ecology/Ecological Relationships*

E. HEADING: SPECIES/POPULATION LEVEL

6. PROGRAM: Basic Biological Understanding (Species-level)

(Grouping) – *Basic Biological Information*

- **Project Description:** [S] Document ephemeral wetlands as sites of concentration and transfer of heavy metals through amphibian reproduction and immigration. *[COP Comment: Looking at the impacts/transfer of heavy metals through amphibian reproduction could be interesting and important, but we conducted a mercury study on vernal pools in Canaan and found that the levels were very low in amphibian eggs (possibly because of the short time spent in the wetlands).]*
- **Project Description:** A health assessment for amphibian communities (including contaminant loads).

(Grouping) – *At-Risk Species/Populations & Endemics*

- **Project Description:** [S] Assess presence of rare and invasive wetland species using contemporary genetic techniques.
- **Project Description:** [S] Assess meta-population structure among vernal pool species.

(Grouping) – *Contaminants/Pollutants Effects on Species/Populations*

(Grouping) – *Invasive Organisms Effect on Species and Populations*

- **Project Description:** [S] Determine characteristics that make wetlands vulnerable to invasion and invasive species establishment. *[COP Comments: Much work has been done on ecosystem vulnerability to invasive species- this research may not be necessary. However, it would be useful to have a prioritization of wetlands that need management to protect them from invasives.]*

(Grouping) – *Effects of Disease (on a Species or Taxonomic Group)*

F. HEADING: “HOW (THE LCC) SHOULD DO BUSINESS”

- [S] For the stressors currently politically impossible to correct (agriculture, forestry, urban growth, mining, etc.), develop and communicate culturally viable solutions to address these stressors across the landscape.