



Updated: Dec 2013

Overview: Appalachian LCC Funded Projects

[2012-01. A Stream Classification System for the Appalachian LCC {TNC-Anderson}](#)

Description - River classification information is needed to develop and implement instream flow standards and management recommendations so that environmental flows can become integral to all water management decisions from the onset. This project will develop a hierarchical classification for stream and river systems and a GIS map for aquatic ecosystems within the Appalachian LCC. The classification will identify and consistently map ecologically similar types of rivers and streams using a hierarchical set of geomorphic and hydrologic variables deemed appropriate by independent peer reviews and relevant to the spatial scale of management.

Deliverables/Timetable - The study will include a report describing the methods used to evaluate and develop the classification system, a literature review of existing stream classifications, and a GIS stream data set. [Timeline: Jan. 2013 to Oct.2014]

[2012-02. Assessing Future Impacts of Energy Extraction in the Appalachian Mountains {TNC-Dunsmore}](#)

Description - The rapid pace of new energy development coupled with more aggressive methods for extracting traditional fuels pose substantial risks to some of the Appalachians most cherished lands, waterways, and wildlife. Currently, little effort has been paid to the effect of energy development on the swaths of relatively intact, recovering forest habitat that define the Central Appalachian Region. This project employs land use change build-out scenarios from future energy development demand to quantify future impacts on forest habitats across the Appalachian LCC.

Deliverables/Timetable - Maps of wind, oil and gas, and coal development potential for the entire study area will be created. These maps and published projections from federal and state land management agencies will be used to model future build-out scenarios. Impacts of the build-out scenarios will be measured regarding habitat fragmentation of forest resources with a focus on the effects to biodiversity and water production for human populations. The study will also create a probability surface for land disturbance associated with large area surface coal mining and create a public web-based map server. [Timeline: May 2012 to Feb. 2014]

[2012-03. Development of a Hydrologic Foundation and Flow-ecology Relationships for Monitoring Riverine Resources in the Marcellus Shale Region {Cornell/Fisher-Walter}](#)

Description - The emergence of hydraulic fracturing has led to the rapid expansion of natural gas drilling in the Marcellus Shale deposit in portions of Pennsylvania and West Virginia. Millions of gallons of water are needed per fracturing event and will likely put a substantial strain on regional surface and ground water supplies, as well as lead to changes in stream flow that may alter available habitat for freshwater biodiversity and other ecological processes in adjacent freshwater ecosystems. There is a great need for the development of region-wide flow policies to protect stream ecosystems and enhance longterm management of aquatic resources. To that end, this project will develop model(s) that predict ecological responses to flow alteration within the Marcellus Shale region of the Appalachian Landscape Conservation Cooperative (LCC).

Deliverables/Timetable - The study will provide a report assessing availability of hydrologic and ecological flow model(s) suitable for the region, a georeference assessment of available ecological data to inform the ecological flow model(s), the application of the model(s) to anticipate how altered flow regimes will affect critical conditions, and a report that forecasts changes in hydrology and associated predicted biological responses in relation to different water resource development scenarios for critical watersheds. [Timeline: May 2012 to April 2014]

[2012-04. Support for Understanding Land Use and Climate Change in the Appalachian Landscape {NatureServe-Sneddon}](#)

Description - Future climate change adaptation and mitigation strategies will be dependent on the best available projections of how the regional climate will change and on estimates of the impacts those changes will have on the region's natural and cultural resources. Thus understanding the vulnerability of various species and habitats within the Appalachian LCC to climate change is of critical importance. This project will compile climate change vulnerability assessments and other relevant information on vulnerable species and habitats, discern the various methodologies and criteria used in these assessments, and use a team of expert peer reviewers to recommend the most efficient, effective, and appropriate methods for adoption by the Appalachian LCC for conservation and adaptation planning. The recommended method will then be deployed, resulting in vulnerability assessments for a suite of key species/habitats selected in consultation with partners of the Appalachian LCC.

Deliverables/Timetable - Along with a narrative synthesis report containing the review of existing vulnerability assessments with a comparison of methodologies used and a recommendation for the most appropriate vulnerability assessment method, a database will be created of the vulnerability assessments of selected species and habitat. The database will be easily accessible on the web. [Timeline: May 2012 to April 2014]

[2013-01. Data Needs Assessment {Clemson-Baldwin}](#)

Description - Conservation planning is a rapidly maturing field in applied ecology. Numerous methods and data sources have been developed, serving multiple scales and conservation planning goals. There is an extensive academic literature, web presence, and track record of practical application to draw upon in order to conduct conservation planning for the Appalachian LCC. This project will review conservation planning tools, data needs, and integrative processes for the Appalachian LCC and provide packages of available data, as well as interpretive text. Also a review of the Steering Committee conservation planning goals will be undertaken and based on those, the project will prioritize and justify gaps that need to be filled.

Deliverables - This research will produce an analysis of tools, data, and processes to deliver usable, open-source data products and identify critical new data needs, within a short time frame. Extended time frame includes manipulating and producing new versions of critical datasets customized for the Appalachian LCC. A specific conservation planning process will also be developed and execute portions of that process that are possible with available data. Lastly, as these become available, this research will integrate deliverables achieved through science needs projects funded by the Appalachian LCC and currently underway. [Timeline: May 2012 to Jan. 2013]

[2013-03. Riparian Restoration to Promote Climate Change Resilience in Eastern U.S. Streams {FS-Nislow}](#)

Description - Provision of shade via riparian restoration is a well-established management adaptation strategy to mitigate for temperature increases in streams. Effective use of this strategy depends upon accurately identifying vulnerable, unforested riparian areas in priority coldwater stream habitats. The Riparian Restoration Prioritization to Promote Climate Change Resilience (RPCCR) is a web-based tool currently under development, which is designed to allow managers to rapidly identify these high-priority riparian restoration targets. The objective of this research is to complete development of the RPCCR, link it with the Appalachian LCC website, and integrate it with ongoing stream temperature monitoring and modeling efforts within the Northeast Climate Science Center (NECSC) and participating Landscape Conservation Cooperatives.

Deliverables - This research will develop and implement a user-friendly web-based tool to identify priority areas for riparian restoration in the context of predicted climate change at the appropriate scale needed by practitioners. First, a 'shovel ready' prioritization tool for managers facing immediate on-the-ground decisions will be developed. The research will then link directly to ongoing and future stream flow, temperature, and biological response modeling projects and decision support tools. In addition, a short article in a peer-reviewed journal detailing this project will be published. [Timeline: May 2012 to Dec. 2013]

[2013-04. Classification and Georeferencing Cave/Karst Resources across the Appalachian LCC {AMU-Culver}](#)

Description - Developing a consistent classification system and mapping for cave and karst habitats is a foundational need for these highly unique habitats. However, fine-scale classification and mapping needs for biodiversity and resource management remain fundamentally unmet. Lacking basic information creates a significant barrier to conservation of these systems, their contributions to water quality, and stability of the rich and unique biodiversity they support. It has been recognized by the Appalachian LCC partnership that in order to develop and deliver landscape-level planning tools it is essential to establish a standard classification system and develop an Appalachian-wide map depicting where cave and karst habitats and resources occur across the landscape. This project will develop cave and karst data and a georeferenced suite of products that are consistent in methodology to support larger-scale planning efforts, yet usable at scales that will support local resource decision-makers.

Deliverables - Research will assemble and identify key location and classification data while developing products that depict and map cave and karst habitats and biological resources across the Appalachian LCC. Based on a critical review of earlier and existing efforts, the project will collect and synthesize data to present cave and karst resource information. Researchers will then propose the most appropriate classification system for these habitats within Appalachia. Maps of the physical and biological resources will be made widely available in order to facilitate easy access and support coordinated conservation efforts throughout the Appalachians.
[Timeline: Sept 2013 to (revised) 2014]

[2014-IAA. Threats & Environmental Benefits Characterization and Georeferenced Assessment across the Appalachian LCC {FS-SRS-Lee}](#)

Description – Knowing which ecosystem services are provided and who benefits from these services will allow resource managers, scientists, industries, and the public to explore new institutional, market, and policies to encourage protection of and investments in these resources. Objectives of this project are to 1) link the environmental and economic values of the region’s natural assets in a way that establishes a common language for resource managers, scientists, industry, local government and the public to substantively engage in landscape-level conservation planning and 2) to explore different development or management strategies and examine trade-offs to support improved and informed decision-making.

Deliverables - Determining the cumulative effects of stressors on Appalachian ecosystem integrity, functionality, and endemic or trust species, is having access to and appreciation of existing knowledge and data. A comprehensive status assessment will be conducted of pre-existing or ongoing work that could contribute to better understanding of individual

or cumulative impacts, and further design of a landscape-scale assessment of environmental threats for the Appalachian LCC-defined landscape. The assessment will: (1) summarize existing threat assessment efforts of major stressors—including measures of ecosystems integrity, function, or sustainability, and identification of endemic species or trust species affected, (2) identify knowledge gaps and/or limitations to existing tools, methodology, and approaches, and (3) through a critical analysis and consultation based on expert-opinion, identify a framework and propose a process to facilitate the AppLCC systematically moving forward on a comprehensive threats assessment.

[Timeline: Pending]

