



# APPALACHIAN

LANDSCAPE CONSERVATION COOPERATIVE



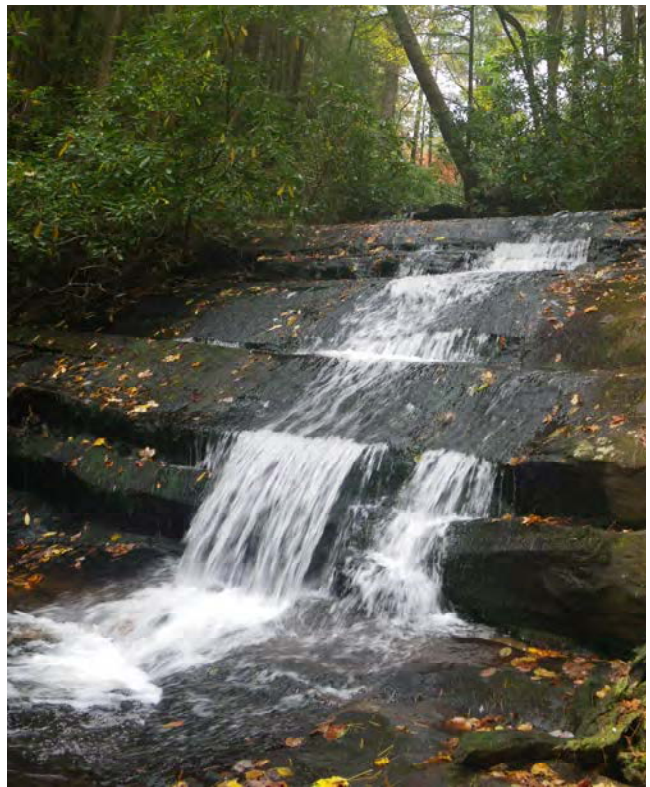
**2011 ANNUAL REPORT**

# Introduction

## Landscape-level Conservation

Many of the environmental issues of today transcend state lines and organizational areas of responsibility. This is especially true in the Appalachian region, which is entering an era of monumental conservation challenges. The Appalachian Mountains and the rivers they serve are experiencing expanding and accelerating impacts of climate and land-use changes associated with energy development, urban expansion, and transformation of agricultural lands. This has resulted in the wholesale loss and fragmentation of habitats, genetic isolation of species, dramatic changes in the water cycle with increased risk of flooding and water scarcity, and the expansion of harmful invasive species. The effects of these threats will be exacerbated by expanding and emerging land-use changes as well as a changing climate.

The scale of the changes and accompanying impacts require conservation and natural resource managers to rethink how to go about conservation planning and delivery. Conservation **planning** necessitates a shift from the traditional localized and single-species approaches and move towards a broader, more comprehensive scale to protect species, habitats, and ecosystems in a large, interconnected matrix of conserved lands. Enhanced conservation delivery can be achieved with greater **coordination** and more strategic **investment** of scarce resources, as well as the development and application of scientific information and decision-support tools

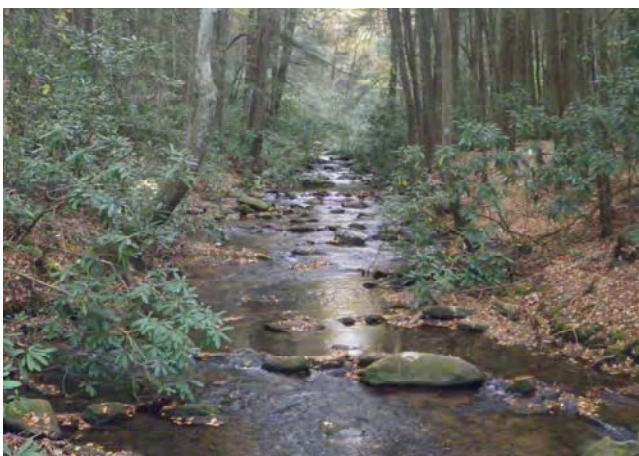


and models. Given the observed and projected impacts of land transformation, expanding energy development, and changing climatic conditions, it is clear that this is the only way to support current populations, provide for ongoing evolutionary processes, and respond to environmental changes. The formation of the Appalachian Landscape Conservation Cooperative (LCC) serves as the mechanism to bring conservation scientists and managers from various organizations and institutions together to identify shared areas of interest, develop the tools and products necessary for action, and help coordinate conservation delivery. This report details the formation and achievements of the Appalachian LCC in its first year.

# Achievements Over the Past Year

## Establishment of the Appalachian LCC

The formation of the Appalachian LCC began in late 2010 with the support of the U.S. Fish and Wildlife Service (USFWS) Northeast Regional and Field Office dedication of resources and planning. Sherry Morgan, USFWS Assistant Regional Director in the Northeast Region, was appointed as acting coordinator during this initial phase of the Appalachian LCC development. The first planning efforts began by convening a 'Strategic Habitat Conservation Workshop' that focused on how strategic habitat conservation can be initiated within the Appalachian region and the specific functions the Appalachian LCC might address. Workshop participants, consisting of federal and state resource commissioners and directors, served to expand the partner dialogue, develop a unified message, and identify the audience that the Appalachian LCC would serve. The workshop also helped in communicating the critical value of coordination among field offices, programs, and partners when conducting landscape-level conservation.



USFWS also leveraged staff time to help draft an Operations Plan for the Appalachian LCC. The plan was developed through a USFWS team consisting of Bridgett Costanzo, Callie McMunigal, Dwight Cooley, and Mark Endries, each representing different Regions and Programs of the USFWS. This draft document set out to formalize guidelines and organizational commitment. The draft describes the landscape-level challenges, expresses why there is the need for a landscape conservation approach in the region, and identifies the research and management capacity at the federal, state, tribal, and additional levels. It serves as a starting point for subsequent planning documents.

A key stage for any LCC is securing full-time staff positions to handle day-to-day activities and help coordinate development. Dr. Jean Brennan, a Senior Climate Change scientist and former Senior Conservation Scientist for the U.S. Agency for International Development, was hired as the Appalachian LCC coordinator in September 2010. She oversees operations of the Appalachian LCC to track funding and budgets, supervise staff, represent the Appalachian LCC in various technical and outreach meetings, report on accomplishments, and serves as part of the technical planning team. During her first year as coordinator, Jean dedicated much of her time to engaging potential partners and stakeholders and participated in "listening sessions" to identify conservation and research expertise, needs, and capacity in the region. These sessions provided the first introduction for many stakeholders and partners into landscape-level conservation and how the Appalachian LCC could provide a forum and a mechanism to enhance adaptive management and deliver on-the-ground

conservation on a regional scale.

## **Decision-Making Body: Governance Structure and Membership**

In December 2010, David Whitehurst of the Virginia Department of Game and Inland Fisheries was asked to be chair of the Interim Steering Committee (ISC). As chair, David convenes and presides over all official ISC meetings and conference calls and provides direction to the coordinator of the Appalachian LCC. One of his first acts in this position was to help identify many of the leading conservation leaders from across the region - those currently managing resources or implementing conservation delivery - to help formalize the ISC. The committee currently consists of representatives from federal and state agencies, non-governmental organizations (NGOs), a representative of one of the Federally-recognized tribes that manage lands across the LCC, and the chairs or appointed representatives of regional partnerships.

The first year of the Appalachian LCC development set in place the governance and decision-making body and crafting of its charter. The governance structure of the Appalachian LCC consists of four levels: (1) **Interim Steering Committee** (ISC) - the decision-making and oversight body with an Executive Sub-Committee drawn from the full Committee; (2) **Staff and Teams** - core staff or partner staff assigned to support the Appalachian LCC and other leading experts to serve as part of technical advisory teams that serve on an on-going basis; (3) **Groups** - working or advisory groups established to address specific topics or issues, often drawn from partner organizations for short-term projects

or efforts; (4) **Stakeholders** - the Appalachian LCC is committed to engage, and put in place, a process to report on the work of the Appalachian LCC and to solicit feedback from the broader stakeholder groups of impacted members of society across the region.

The year was also marked by the members' articulation, approval, and adoption of a vision and mission statement to guide its work:

***Vision:** To protect the valued resources and biological diversity of the Appalachian region, sustain the benefits provided by healthy and resilient ecosystems to human communities, and help natural systems adapt to large landscape-level stressors and those stressors that may be magnified by the changing climate.*

***Mission:** To achieve sustainable landscape-level conservation through partnerships, shared resources, enhanced science-based management capacity, landscape level planning, and to support conservation actions and research as part of a national network.*

## **Identifying Network of Partners**

At the same time the Appalachian LCC was establishing a comprehensive governance structure, it set out to identify partners and partnerships that would be critical to achieving its mission. Since these partners will be key in implementing any landscape planning effort and delivering conservation on the ground, it is essential to understand

their management interests and research needs. Working with these partners to evaluate existing conservation strategies, the Appalachian LCC hopes to support an adaptive management approach that generates new science tools and research products to improve conservation planning.

Appalachian LCC sought out partners and multi-state public/private partnerships that are involved in managing land and resources or have begun regional initiatives. Examples include the USFWS supported public-private Fish Habitat Partnerships and Bird Joint Ventures and the Central Appalachian Integrated Landscape Initiative led by the West Virginia Chapter

of The Nature Conservancy.

The organization also engaged with all of the states in the region to participate in this new venture. Many of the states in the region took the opportunity to participate. Attempts were also made to engage initiatives like the Appalachian Regional Commission and various land trust associates. Given the “Interim” status of the ISC, the Committee will continue to reexamine its membership and the capacity each organization brings to the conservation and planning efforts as attempts at reengaging states, other initiatives, and additional tribes in the region continue.

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## Key Issues and Decisions in Year 1

*The ISC met five times in either a physical or virtual capacity throughout FY11. During the year, the committee addressed key issues regarding the development of the Appalachian LCC on many fronts. It was agreed early on to first keep it as an Interim Committee for a period of time not to exceed two years, to lend the partnership flexibility in the governance structure as the cooperative develops.*

The ISC made a number of important decisions in its first full year to set the direction and tone of the partnership (see text box), and begin to make progress on its primary goal of improving the science foundation for conservation work in the Appalachians. Two big strides were accomplished: 1) the joint-hiring of a Communications Specialist to be shared with the Appalachian Mountain Joint Venture office and 2) the approval of five top science needs toward which the Appalachian LCC would apply available funds (details discussed in next section of this report).

A major focus area identified during these meetings was the need to pursue social engage-

ment and focus on human dimensions. The ISC deemed it crucial to obtain baseline information on what the public needs and views as important regarding conservation and landscape planning in the region. There was consensus to engage stakeholders and interact at the social and cultural level, stressing the importance of jobs and the economy and why people should care and feel connected to the work of the Appalachian LCC. In the governance charter, the Appalachian LCC committed to host an annual Stakeholder Group Forum to receive input from various parties to better understand potential priorities, issues, concerns and needs and assure that current activities

## 2011 Accomplishments and Decisions

1. Decisions of ISC will be made on the basis of one-vote per agency represented (May 4, 2011).
2. An Executive Subcommittee was established, their votes to represent the best interests and intentions of the ISC body, not necessarily their respective agencies (May 4, 2011).
3. Adoption of Mission and Vision Statements (Sept. 2, 2011).
4. Adoption of Interim Governance Structure and Charter (Sept. 2, 2011).
5. The ISC considered whether to act on several requests to adjust LCC boundaries. It was decided that for modest boundary adjustments, decision-making authority would be delegated to the LCC Coordinator. For significant boundary changes, it was determined that LCC staff should develop recommendations and present these for ISC vote (Dec. 8, 2011).
6. The ISC decided not to entertain the current written request from the GCPO LCC but to instead defer its decision until the Appalachian LCC was in its own planning phase (Dec. 8, 2011).
7. The ISC considered whether to use a portion of FY11 project funds to jointly hire a Communications Specialist, to be shared with the Appalachian Mountain Joint Venture. This measure passed (Dec. 8, 2011).
8. The ISC approved use of Appalachian LCC funds toward Top 5 Science Needs as recommended under outcomes of November 2011 Priority Conservation Science Needs Workshop held in Blacksburg, VA (Dec. 8, 2011).

are aligning with these needs.

A strong commitment was also made to communicate both internally among members and externally with the greater public. Towards this goal, the committee expressed the need to communicate with each other at least once a month and recruit staff to focus on outreach for the organization. The Appalachian LCC social networking website was redesigned into a content management system web portal, with public and private group workflow and improved content storage, organization, and search. Functionality was added for cross sector exchange and engagement to support the activities of the Appalachian

LCC and landscape-level conservation in the region. New members, groups, content, photos, videos, other relevant multimedia, and links are continuously added to provide further information and exchange. The Appalachian LCC is also supporting partners by hosting on the Appalachian portal companion websites with full functionality for content storage, sharing and social networking.



# Tapping into Research and Management Expertise across the LCC: Communities of Practice

2011 was the first year the Appalachian LCC received dedicated federal funding for science research. Leadership was committed to seek out science information and tools needed to facilitate conservation delivery and landscape-level planning. As a result, the Appalachian LCC staff worked to structure a “Conservation Priorities Science Needs Workshop” in November to reflect the Conservation Priorities identified by the partner member organizations. Again, the USFWS demonstrated its support of the Appalachian LCC by appointing Bridgett Costanzo, a 20-year veteran service biologist, to serve as the acting Science Coordinator to help organize the “Science Needs Workshop”.

## Definition of a Community of Practice:

An informal, self-organized, network of peers with diverse skills and experience in an area of practice or profession. Such groups are held together by the members' desire to learn from others by sharing information and problem solve as a group to achieve shared goals.

Workshop attendees were carefully selected in order to represent the depth and scope of the conservation practitioners across the LCC landscape, and determine their science needs. Great effort went into balancing Sectors (Federal, State, non-government organizations, partnerships), Professional focus (management or research-focused responsibilities), and communities of practice, grouped by expertise.

This structure allows the Appalachian LCC to draw upon a “Community of Practice” (CoP) to address conservation challenges by facilitating the

formation of technical groups by expertise (taxonomic, habitat, systems-level, etc.). CoPs within the Appalachian LCC include such diversity of topics as migratory birds, freshwater mussels, karst habitats, ecosystem services, bat conservation, early successional habitats, high elevation habitats/species, and data management/GIS experts as well as biometricians. By assembling groups of experts who share a

**Participants at Science Needs Workshop:**

| Sector                    | %   |
|---------------------------|-----|
| Federal                   | 43% |
| State (+Coop +CESU)       | 28% |
| Other (=NGO, Univ, Copr.) | 28% |

| Profession  | 139 |
|-------------|-----|
| Managers    | 72  |
| Researchers | 67  |

| Expertise / Profession | North     | South     |
|------------------------|-----------|-----------|
| Aq-Manager             | 11        | 15        |
| Aq-Researcher          | 11        | 7         |
| Terr-Manager           | 13        | 10        |
| Terr-Researcher        | 8         | 11        |
| CC-Manager             | 3         | 3         |
| CC-Researcher          | 4         | 4         |
| Human Dim-Manager      | 7         | 5         |
| Human Dim-Researcher   | 10        | 3         |
| IT-InfoMgmt-Manager    | 3         | 2         |
| IT-InfoMgmt-Researcher | 4         | 5         |
| <b>TOTALS</b>          | <b>74</b> | <b>65</b> |

Photo Source: B. Smith



common focus and knowledge, the Appalachian LCC can benefit from their collective expertise and experience to achieve focus on the most important resource issues challenging conservation in the Appalachians. These experts have already been used to recommending science needs that are most important to their communities and have come together to form technical work groups, teams, and partnerships where joint interests must be fully considered to address broad-scale conservation challenges or landscape planning affecting multiple ecosystems and taxa.

The composition of the Workshop participants further built upon this concept of fostering a Communities of Practice platform to assemble and focus on identifying critical needs, gaps, and opportunities to address conservation challenges across the Appalachian landscape. The workshop participation was broad, including agency management representatives, university and agency researchers, policy experts, and conservation delivery partners who all brought their collective on-the-ground knowledge and expertise to represent the current state of understanding on conser-

vation priorities in the region.

A “Directory of Expertise” was created from this list of technical experts and includes a detailed database with contact information, organizational affiliation and job title, and a self-identified assessment of each participant's area of expertise. The directory is categorized between those that primarily produce science information (researchers) and those that use the information (managers). It groups them by areas of expertise such as aquatic, terrestrial, human dimensions, climate change, and information technology, by the sector they are affiliated with, be that a federal agency, state agency, or other (University, NGOs, and business), and whether they are located in the northern or southern portion of the Appalachian LCC range.

To date, the Appalachian LCC does not have a standing Technical Team (as is common among other LCCs), but instead task-oriented technical work groups to address specific needs as they arise. The wide range of expertise available may be assembled and reassembled to create the best mix of knowledge to address the problem at hand. By remaining flexible, and molding work groups by topic and within specific time frames, we have been able to both bring diversity of thought to address specific activities while attempting to temper time commitment requests to our partners.





## Development of Science Need Portfolio and Top Ranked Science Needs

The “Science Needs Workshop” laid out an ambitious agenda to assemble management-relevant information provided by the various resource management and conservation communities. Over 150 field biologists, resource managers, and community members attended the workshop. They were asked to reflect on materials assembled by Appalachian LCC staff through listening sessions and those shared by field offices, partners, and academic colleagues. Participants were also asked to identify additional technical experts in conservation management or science that operate across the Appalachian LCC and neighboring regions whom the LCC could invite to assist with determining science needs priorities. By assembling this list of technical experts, it was possible to identify the various CoPs that have self-assembled virtually or may already be working collaboratively across the region.

During the workshop, attendees first assembled according to their area of expertise. They were then asked to identify a comprehensive list of science information and research needs organized by thematic areas and described by the supporting



goal each area was to contribute for conservation managers and partners to work more effectively across the Appalachian LCC.

Once this comprehensive list - referred to as the “Portfolio” - was identified, participants reassembled into 6 “homogenized” groups, with each group having a representative for each area of expertise. They were then asked to reexamine the Portfolio and also to identify the top ranked science needs as areas of investigation or projects to recommend for immediate funding. The resulting five science needs found below were selected based on whether the activity or research addresses landscape-scale issues, improves the research knowledge base, enhances conservation planning and adaptive management, or represents the next logical step in research:

1. Understand Relationships among Ecological Flows, Species, and Habitat at Multiple Scales in the Aquatic Environment & Assess How Alterations to Systems will Affect Sustainability
2. Forecast Future Resource Extraction & Demands for Energy in the Appalachian Region
3. Develop GIS and Content Management Systems that Facilitate Community Networks, Support Landscape Planning, and Enable Exchange of Tools and Information
4. Understand Species and Habitat Distribution Trends in Forests, Wetlands, and Open-land Communities
5. Support Vulnerability Assessments to Identify Habitats and Species that would be Most Vulnerable to Climate Change in the Appalachian LCC.

# Investing in Research and Conservation Delivery

## Process for Developing Top Science Needs Projects and Approving Contracts

Upon completion of the “Science Needs Workshop,” the ISC met in December 2011 and approved the top five ranked science needs recommended by Workshop participants. The Committee then provided instructions to Appalachian LCC staff to accept nominations for expert scientists who would be assigned to workgroups tasked with developing 1-3 detailed project descriptions under each of the five top science needs. Nominees were named by ISC members or partner staff who had served as facilitators and note-takers at the Workshop and focused almost exclusively on individuals who had attended the November Workshop to maintain continuity of thought and intent.



A total of 10 project descriptions were prepared by the workgroups, and six of these were selected by the ISC to be pursued under Requests for Applications: 1) Ecological Flows, 2) Aquatic Habitat Classification, 3) Forecasting Energy, 4) Terrestrial Landscapes, 5) Rare Endemics, and 6) Climate Change Vulnerability Assessments. We received 24 applications in response to the six RFAs, and four applications have been awarded grant money to conduct landscape-level research and studies in the Appalachian region:

1. Development of a hydrologic foundation and flow-ecology relationships for monitoring riverine resources in the Marcellus Shale region
2. A Stream Classification System for the Appalachian Landscape Conservation Cooperative
3. Assessing Future Impacts of Energy Extraction in the Appalachian Mountains
4. Support for Understanding Land Use and Climate Change in the Appalachian Landscape

*Two additional proposals have been accepted and are currently awaiting funding:*

- Landscape-scale Maps of Terrestrial Habitat and Ecosystems Based on a Common Mid-level Classification Framework for the Appalachian LCC
- Development of Foundational Spatial Datasets for the Appalachian Landscape: Rare Species Locations and Priority Conservation Sites

## Funding Decisions for FY11/12

The Appalachian LCC Interim Steering Committee approved use of FY11 funds to support one half of a full-time Communications Specialist position, to be a shared resource with the Appalachian Mountain Joint Venture. The remaining available funds were applied to support science projects.

Using the mechanism of a Request for Applications, identification of the five top science needs resulted in the ISC's subsequent approval for the execution of four contracts to support these needs, as follows:

### Appalachian LLC Sponsored Projects for FY 2011/12

#### 1. Development of a hydrologic foundation and flow-ecology relationships for monitoring riverine resources in the Marcellus Shale region

**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 long-term 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 geo-reference 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. The estimated timetable is from May 2012 to the end of April 2014.

#### 2. A Stream Classification System for the Appalachian Landscape Conservation Cooperative

**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. The estimated timetable is from January 2013 to October 2014.

### **3. Assessing Future Impacts of Energy Extraction in the Appalachian Mountains**

**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. The estimated timetable is from May 2012 to June 2013.



### **4. Support for Understanding Land Use and Climate Change in the Appalachian Landscape**

**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. This project's estimated timetable is from May 2012 to end of April 2014.



## Next Steps

In the coming year, the Appalachian LCC will work to commit resources to projects that fill in gaps of knowledge, continue to strengthen organizational capacity, and foster communication with stakeholders and the community at large. Relying on the wealth of scientific and management expertise in the region, the Appalachian LCC will work to define and implement a 3-5 year work plan for the organization while also pursuing data integration with partners and sharing and supporting climate change monitoring and research.



### TO LEARN MORE

**Appalachian Landscape Conservation Cooperative**

[www.applcc.org](http://www.applcc.org)

**DOI LCC homepage**

[www.doi.gov/lcc](http://www.doi.gov/lcc)

**Contact the Appalachian LCC**

[communications@applcc.org](mailto:communications@applcc.org)

The Appalachian LCC is a self-directed regional partnership.  
The Department of the Interior through the U.S. Fish and Wildlife Service  
is providing project support and staff to facilitate this partnership.



Appalachian LCC website [www.applcc.org](http://www.applcc.org)