

The Arctic Landscape Conservation Cooperative Conservation Goals

Adopted by the Arctic LCC Steering Committee, 24 August 2010

Background : Landscape Conservation Cooperatives and Climate Science Centers

Climate change is driving rapid and broad changes in the global ecosystem, which are documented extensively in recent scientific literature. These changes include increasing temperatures, varying precipitation, rising sea levels, and acidifying oceans. These changes, in turn, are impacting local environments and economies. Sea level rise puts landscapes important to humans and wildlife at risk; variations in precipitation affect water resource availability for humans and natural systems; temperature changes affect terrestrial and aquatic systems, species distributions and interactions; these same forces will also pose threats to our Nation's cultural traditions and resources. Accomplishing conservation goals in a changing climate will be more challenging and complex than ever before. Success will require building integrated capacities, forging shared goals, and cooperating to define and implement conservation strategies to meet these challenges.

The Department of Interior established Climate Science Centers (CSCs) and Landscape Conservation Cooperatives (LCCs) as a means to integrate DOI and partner science and management expertise in a coordinated response to climate change. These organizations will provide information and management practices to support strategic adaptation and mitigation efforts.

Landscape Conservation Cooperatives are manager-scientist partnerships that inform integrated resource management actions addressing climate change and other stressors within and across landscapes. They will link scientific research with conservation delivery. Each LCC functions within a specific landscape, but it also will be part of a national, and ultimately, international network. LCCs are true cooperatives, formed and directed by land, water, wildlife and cultural resource managers, and interested public and private scientific organizations. Federal, state, tribal, and local government and non-governmental organizations are all invited as partners in LCC development. Each LCC will be directed by a Steering Committee representing partners working in that region.

CSCs will convey basic climate change impact science. The deliverables are anticipated to include an assessment of climate change impacts on natural and cultural resources, as well as adaptive management and other decision-support tools for managers. The CSCs will work with partners to facilitate the coordination of fundamental climate science capabilities and monitoring activities across the State. Potential partners in Alaska include federal, state, and local government agencies, as well as university, tribal/Native, and NGO entities. CSCs will synthesize, integrate, and communicate existing climate change impact data gathered by federal agencies, as well as internal and external partners. CSCs will identify data gaps and prioritize fundamental science, data, and decision-support activities based principally on the needs of the LCCs.

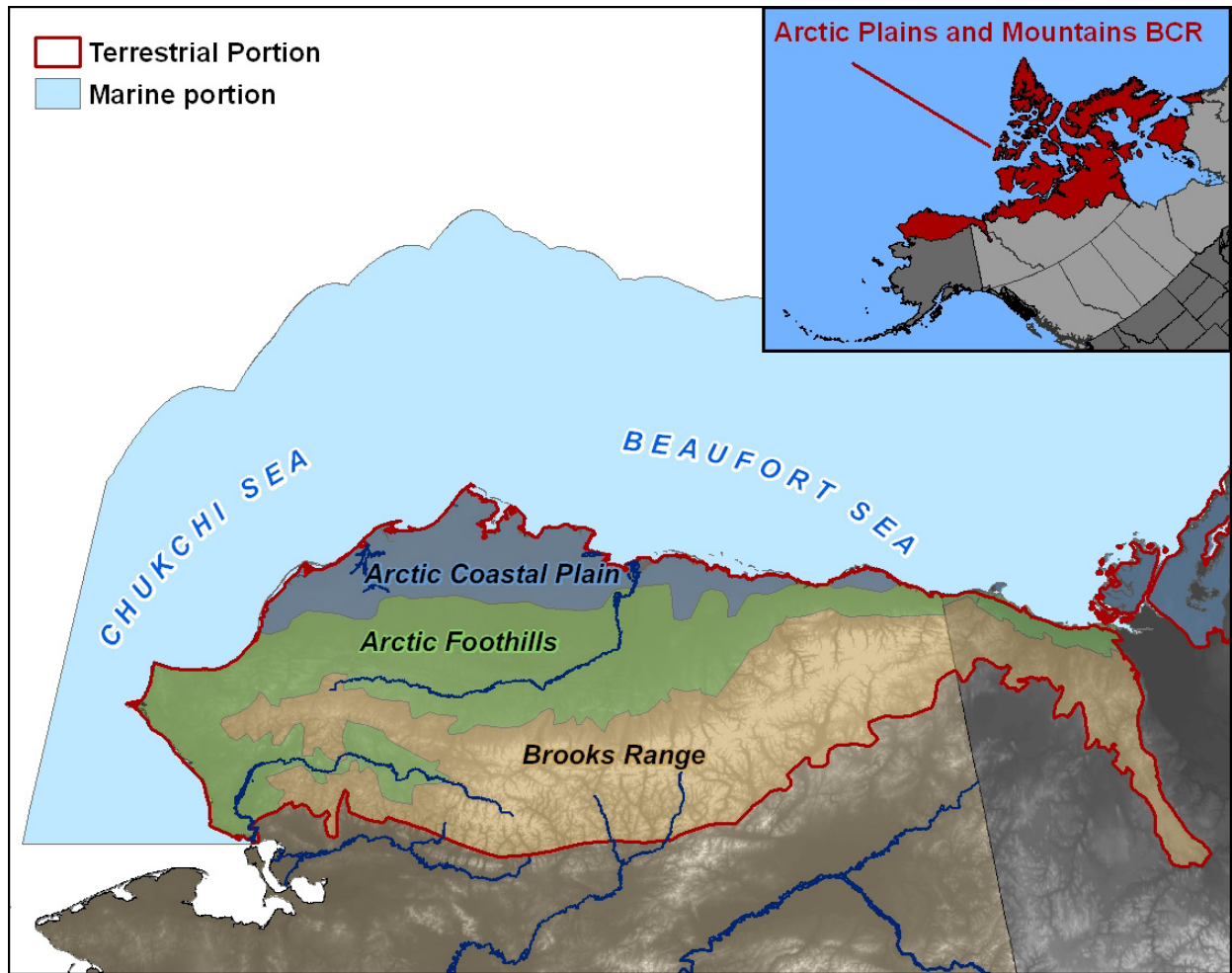


Figure 1. Spatial extent of the Arctic Landscape Conservation Cooperative. Marine portion extends 200 nautical miles offshore. Ecoregions follow *Gallant et al. 1995. Ecoregions of Alaska. USGS. Professional Paper 1567.*

Introduction to the Arctic Landscape Conservation Cooperative

Many human activities associated with environmental stressors – introduction of invasive species, fire suppression, urbanization, road-building, utility corridors, agricultural conversion – have occurred to a limited extent in the North American Arctic. Though the arctic region remains a relatively undeveloped landscape, it is not without resource management challenges. Arctic landscapes are among the most vulnerable to indirect effects of a warming climate. The prospect of broad-scale ecological change will require resource managers to evaluate issues over larger geographic and temporal frames, and without previously-held assumptions of stable environmental conditions. To meet this need, the Arctic LCC was established in early 2010 and is the first operational LCC in Alaska. The Arctic LCC will be a self-directed conservation partnership among federal, state, and local governments, tribes, nongovernmental organizations, academic institutions and other entities operating within northern Alaska and northern Canada. It will address emerging natural resource issues in the Arctic through a collaborative effort linking science and conservation. The work of the Arctic LCC will also provide tools to predict impacts of environmental change on subsistence and cultural resources. Early work of the LCC included establishment of a Steering Committee to establish broad conservation goals, set priorities, facilitate key activities, leverage funding across agencies to accomplish priority tasks, and provide operational oversight.

The Arctic LCC region includes the Arctic Plains and Mountains Bird Conservation Region (BCR 3), that encompasses northern Alaska and Canada (Figure 1). Within Alaska and adjacent Canada, the Arctic LCC encompasses three ecoregions: the rugged slopes and valleys of the Brooks Range, the rolling hills and plateaus of the Arctic Foothills, and the broad, flat, Arctic Coastal Plain characterized by extensive wetlands and numerous water bodies. For the purposes of this document, the term “Arctic” will refer to the union of these ecoregions. The geographic scope of the Cooperative extends into adjacent marine areas of the Beaufort and Chukchi seas to the limits of the US and Canadian Exclusive Economic Zones adjacent to the terrestrial area of the LCC. Initially, the primary geographic focus of the Arctic LCC will be the terrestrial portion within Alaska. Physical and ecological processes link terrestrial and marine systems, however, and Arctic LCC interests will extend into the marine environment, particularly the nearshore zone. Many Arctic species are distributed in a circumpolar manner, and conservation concerns for shared populations are expected to motivate work that crosses international boundaries.

The 2010 work plan (the Arctic Landscape Conservation Cooperative Development and Operations Plan, April 2010) was developed by LCC staff in consultation with the Steering Committee.

Conservation Goals

An early recommendation of the Arctic LCC Steering Committee was that the LCC should identify priority science needs and conservation goals that can be advanced by pooling the capacities and resources of the partnership. From this, conservation strategies would be developed and the LCC would then develop implementation plans for each goal. The Steering Committee provided further general guidance and suggested that the LCC should: 1) enhance our

understanding of broad landscape-level processes; 2) identify priority land use management and conservation issues; 3) ensure that information about the changing Arctic landscape is readily accessible to resource managers and the research community at large; and 4) support planning processes that guide shared conservation efforts in the Arctic LCC region.

Subsequently, the Steering Committee identified four priority conservation goals:

1. Better understand and predict effects of climate change and other stressors on landscape level physical and ecosystem processes.
2. Better understand the impacts of environmental change on subsistence and cultural resources.
3. Provide support for resource conservation planning.
4. Contribute to improved data management and integration.

Each conservation goal is described in more detail below. Several near-term and long-term objectives have been identified that will support achieving each conservation goal. More specific action items will be developed in annual LCC Work Plans.

Goal 1. Better understand and predict effects of climate change and other stressors on landscape level physical and ecosystem processes.

Global climate models forecast the Arctic will continue to be the most rapidly warming region on the planet, but the resultant changes in the physical and ecological setting are highly uncertain. Effective conservation planning depends on knowledge of the relative vulnerabilities of habitats, species, and species assemblages. Species vulnerability is a function of sensitivity (potential responsiveness to a given change in conditions), exposure (how much change a species is likely to experience), and adaptive capacity (ability to accommodate to climate change impacts). Assessment of exposure requires an understanding of how climate interacts with physical and ecosystem processes to shape the landscape. Sensitivity and adaptive capacity can be assessed through biological research and long-term monitoring. A full picture of vulnerability requires interdisciplinary work that recognizes the interdependencies among these components. Although climate may be the most prominent driver, other natural and anthropogenic drivers must be considered as independent, yet interacting, agents of change.

Because the Arctic is a vast and remote area, we are lacking critical information on basic physical processes (such as hydrologic and temperature regimes) that maintain habitats. For this reason the Arctic LCC should support efforts to monitor key processes that create and maintain Arctic habitats and species. In addition to implementing better observational systems, there is a need for experimental studies that examine climate-associated habitat change, especially research that supports development of predictive tools to assess likely future impacts. To identify habitats that are most likely to change significantly and that are of greatest importance for species of concern, observational and experimental data should be used in models to project landscape changes under varying climate scenarios. These models should be continually refined by treating the output as hypotheses to be tested against new observational and experimental data.

Objectives:

1. Develop criteria to select physical and ecological processes, habitats, species assemblages and individual species that merit focused attention from the LCC.
2. Identify opportunities for contributing to monitoring networks that track physical parameters and coordinate LCC partner participation in those networks.
3. Develop strategies to support the identified priority physical process research and modeling needs. In particular, seek opportunities for the LCC partners to leverage expertise and resources where appropriate, and pursue funding opportunities from other sources that typically fund geophysical and ecosystem research, many of which are expanding their Arctic research programs (such as DOE, NASA, NOAA, and NSF).
4. Establish connections/develop support for research and monitoring initiatives with similar objectives, such as Arctic Long Term Ecological Research, National Park Service I&M programs, National Wildlife Refuge I&M programs, North Slope Science Initiative, and Study of Environmental Arctic Change.
5. Identify opportunities for enhancing monitoring programs targeting priority habitats, species assemblages, and individual species; coordinate LCC partner participation in those networks.
6. Develop models that link individual and populations response to changing environmental conditions (i.e., species-habitat associations) that can inform conservation efforts for priority species.
7. Address identified but unmet science needs that support conservation of species and habitats through analysis and recommendations for methods, tools, and management practices that agencies may use to implement on-the-ground conservation actions.

Goal 2. Better understand the impacts of environmental change on subsistence and cultural resources.

Humans have been present in the Arctic for thousands of years, depending upon its natural resources for their survival and well being. The area contains many historic and prehistoric sites and structures, and there is a rich ethnographic record of resource uses. Many communities within the Arctic LCC are heavily dependent on subsistence hunting, fishing, and gathering. Subsistence uses, as well as subsistence and cultural resources, will be most effectively understood, protected, managed and effects mitigated if a landscape approach is used and broad-based cooperation is achieved among resource management agencies, communities, Alaska Native organizations, and other government and non-government groups. Although documenting changes in subsistence uses, subsistence resources, and cultural resources can be relatively straightforward, predicting future effects of climate change and other factors on these

activities and resources is a complex undertaking. The LCC will help make information on effects of climate change and other factors on subsistence uses, subsistence resources, and cultural resources in the Arctic readily available for use in planning and decision making by subsistence users, resource managers, and other affected or interested parties.

Objectives:

1. Work with stakeholder groups like the North Slope Borough Fish and Game Management Committee which is comprised of representatives from subsistence communities to identify ways to: 1) monitor changes in subsistence resource abundance and use patterns; 2) integrate traditional ecological knowledge into geospatial data systems; and 3) effectively disseminate information and findings among subsistence users.
2. Focus monitoring, research and modeling activities of the Arctic LCC on species and habitats important for subsistence use. Information generated from these efforts will be made accessible to all stakeholders to inform conservation of subsistence resources.
3. Conduct an assessment of datasets and geospatial layers that will serve as a baseline for ongoing assessment of subsistence activities and cultural resources at risk.
4. Convene a Work Group to define the role of LCCs with respect to stewardship of cultural resources. Work with social scientists and cultural specialists, such as the Alaska Interagency Ecosystem Health Workgroup and the Alaska Native Tribal Health Consortium, to identify mutually beneficial areas of collaboration.

Goal 3. Provide Support for Resource Conservation Planning

Although the Arctic is a vast remote region, it is not without management challenges related to human activities. The types of human activities that occur in Alaska's Arctic include:

- Industrial activities including construction, shipping, and resource extraction.
- Visitation and recreation including hiking, camping, fishing, mountaineering, float trips, and hunting.
- Community infrastructure, including energy, transportation, and waste management.
- Research and monitoring activities, including conducting field research, construction and operation of research stations, and deployment of monitoring stations.
- Development of terrestrial, air, and marine transportation corridors.

Land managers, such as the Bureau of Land Management, U.S. Fish and Wildlife Service, Bureau of Ocean Energy, Management, Regulation and Enforcement, Alaska Department of Natural Resources, National Park Service, and North Slope Borough, are all currently working to conserve natural resources while providing for multiple uses. The size of the Native and public land holdings in the Arctic are very large, totaling in the millions of acres both onshore and offshore. As Arctic land-use planning is becoming increasingly complex and dynamic, managers would benefit from access to support tools developed for a landscape-scale decision

framework. The LCC will facilitate near-term (2-5 year) conservation actions by providing decision-makers better information about current conditions of natural and cultural resources. The LCC will also support longer-term (multi-decadal) conservation design with predictive tools that allow evaluation of alternative management options in the context of a changing landscape resulting from the cumulative impacts of natural and anthropogenic change.

Objectives:

1. Conduct a needs assessment for datasets and geospatial layers that will inform near-term conservation and management actions and serve as a baseline for ongoing planning and environmental assessment.
2. Assemble and make accessible information and geospatial planning tools pertaining to fish, wildlife and cultural resources.
3. Support research and monitoring activities that reflect the needs of the LCC partners relative to near-term management issues, and use that information to update geospatial databases and refine predictive models.
4. Support the development, testing, and application of tools that allow managers to explore the outcome of alternative management strategies under varying climate scenarios and landscape forecasts.
5. Provide syntheses of pertinent research and monitoring results for resource managers

Goal 4. Contribute to Improved Data Management and Integration

Ready access to natural resource information about the Arctic (both current and future data) was repeatedly identified as a practical planning and management need by the LCC partners. The Arctic LCC envisions an information system that will allow sharing among the LCC partnership and geospatial applications for visualizing complex information over the landscape-level conservation framework. This information management system will bring together historic data, current-condition data, and new data generated from monitoring and research programs. It will also provide results of modeling exercises for use in constructing future scenarios. The LCC will benefit from a data system that encourages information sharing within the partnership, across all LCCs, and with stakeholders outside the partnership. Building and maintaining such a system is a complex undertaking; the Arctic LCC can contribute by assisting members with data management and stewardship, and ensuring compatibility with larger data integration and dissemination initiatives.

Objectives:

1. Work with the Alaska Climate Change Executive Roundtable (ACCER) Data Integration Workgroup, and partner with the North Slope Science Initiative, Alaska Climate Science Center, Western Governors' Wildlife Council, Fish Habitat Partnerships, and Joint Ventures to implement the data integration strategies of the DOI Climate Change Response.

2. The LCC data manager will undertake the responsibility for coordination with other data systems as described above. The data manager will ensure compliance with established standards for managing LCC-generated data and for synthesizing existing data in a manner that is compatible with existing and developing information systems.
3. The LCC geospatial specialist will chair a Geospatial Working Group, to coordinate data acquisition among agencies, identify priority geospatial data needs, and work with subject area experts to develop plans for developing or acquiring needed data.
4. The data manager and geospatial specialist will ensure on-line access to data, via existing or newly developed platforms.