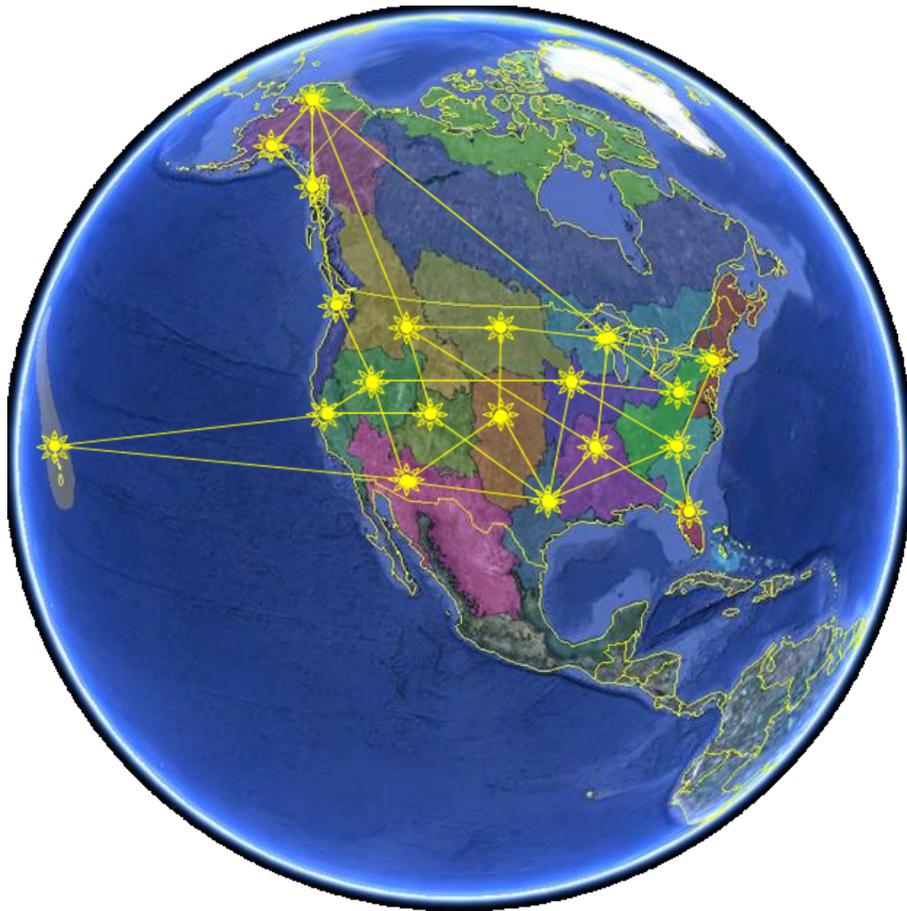


**Landscape Conservation Cooperatives National Network:
Developing a Foundation for Private, State, and Federal
Collaboration and Analysis**

Workshop Report



**March 30 – April 1, 2010
National Conservation Training Center
Shepherdstown, WV**

Executive Summary¹

The Department of the Interior, in cooperation with the conservation community is establishing 21 Landscape Conservation Cooperatives (LCCs) spanning the United States to invigorate collaborative conservation among the private, state, and federal resource management and science communities with responsibility for sustaining the nation's natural and cultural resources. LCCs are management-science partnerships that inform integrated resource management actions addressing climate change and other stressors within and across landscapes.

Although each LCC will operate as a self-directed, non-regulatory partnership, it is in our nation's interest for LCCs to function as an integrated national network as many natural and cultural resources span the boundaries of any single LCC.

Sharing of data, processes, methods, information, and tools is considered essential to facilitate the emergence of an LCC national network. Towards that end, a workshop was convened at the National Conservation Training Center (NCTC) in Shepherdstown, West Virginia, from March 30th to April 1st, 2010. The purpose of the workshop was to identify the data and technical capacities needed to develop the foundation to ensure LCCs emerge as a national network.

The outcomes of the workshop include the following, which are elaborated in this report:

1. Pre-workshop analyses
2. Key messages that emerged from workshop discussions
3. Categorized list of LCC data and technology needs
4. Prioritized actions to support and develop a nationwide network of LCCs

Based on overall workshop deliberations, the following three recommendations are submitted to the Department of the Interior's LCC/Climate Science Center (CSC) Workgroup for their consideration:

1. Establish teams to pursue the six high priority actions identified by workshop participants (see Table 4):
 - i) Utilize the conservation goals and science and data needs of the existing national conservation initiatives and partnerships (e.g. State Wildlife Action Plans, National Fish Habitat Partnerships, etc.) to form a foundation for the LCC's to evaluate in developing a targeted LCC science and data needs strategy that will support the implementation of Strategic Habitat Conservation.

¹ The views expressed in this report are those of the individual workshop participants and do not represent the official position of any agency, bureau or organization.

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

- ii) Develop an outreach strategy/marketing plan to ensure (a) that a consistent message is being communicated and (b) that partners, agencies, and leadership understand the vision, mission, and goals of LCCs and CSCs.
- iii) Assemble the data and models to project future resource states in priority resources, with the goal of achieving benchmark functionality for modeling priority LCC resources.
- iv) Inventory information needs, existing tools, and science information gaps.
- v) Form a data council and hold a workshop to determine data requirements that would inform a national network of LCCs.
- vi) Establish a group of bureau detailees, reporting to the Energy and Climate Change Task Force, responsible for developing a working framework for Secretarial Order 3289.

Include the workshop participants who volunteered for the teams and ensure that LCC Coordinators comprise half of each team's members. Launch the teams at the end of the fiscal year when the LCCs are operational. Waiting until then will ensure more LCC involvement and result in better products.

2. Consolidate and organize efforts in Interior aimed at the data and technology needs of LCCs and CSCs

There are currently at least three efforts in Interior focused on this topic: i) this workshop; ii) a proposal by the Interior Chief Enterprise Architect, and iii) an effort being pursued by the Policy & Partnership Coordinator of the National Climate Change and Wildlife Science Center (NCCWSC). These efforts should be combined under the direction of an accountable manager. The materials produced before and during this workshop constitute valuable resources for this effort.

3. Use collaborative tools to track the activities of the two previous recommendations

As an example, the U.S. Fish and Wildlife Service (FWS) successfully used Sharepoint to track and manage over 200 climate change actions assigned to FWS Regions, Programs, teams, and dozens of individuals in FY 09. FWS is again using this tool to track and manage almost the same number of actions in FY 10 and 11.

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Introduction

A. What are Landscape Conservation Cooperatives?

Conservation challenges in the 21st Century represent a force of change more far-reaching and consequential to our nation's natural and cultural resources than any previously encountered. In response, the conservation and science communities are coming together to develop LCCs. Specifically, LCCs are management-science partnerships comprised of private, state, and federal agencies/organizations who agree to develop a shared vision of landscape sustainability by collaboratively addressing climate change and other stressors impacting natural and cultural resources. LCCs will facilitate the development of adaptation strategies for fish, wildlife, and cultural resources and develop information and tools to inform resource management decisions and actions across landscapes.

B. What is a "National Network" of LCCs?

Many of the conservation challenges facing the nation transcend jurisdictional boundaries. Examples of broad challenges include biological systems that are larger than single LCCs, species that exist in different LCCs during their life cycle, migration corridors, hydrologic events, and comprehensive land conservation strategies.

To address these broad-scale issues effectively, LCCs must operate as a seamless national network. As such, LCCs will collaborate to develop integrated ecosystem goals and objectives that cross LCC, organizational, and jurisdictional boundaries. Examples of such goals and objectives are: population size and recruitment rates, standard objectives for water quality and quantity, protecting cultural resources, eradicating invasive species, and length and location of migration corridors.

The national network of LCCs will seek to coordinate and integrate partner projects and plans to inform natural and cultural resource management across terrestrial, aquatic, coastal, and marine ecosystems. Additional information about LCCs, including published documents and guidance, and a great deal of information developed for and during this workshop can be found at the following websites:

Interior LCC website: <http://www.doi.gov/whatwedo/climate/strategy/LCC-Map.cfm>

US Fish and Wildlife Service (FWS) LCC website: <http://www.fws.gov/science/SHC/lcc.html>

LCC Workshop Website:

http://training.fws.gov/CSP/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Origin of the Workshop

The vision of integrating science and management expertise among the conservation and science communities in order to address impacts of climate change and other stressors within and across landscapes will require thoughtful, innovative, and collaborative use of data and technology.

The FWS, US Geological Survey (USGS), and the Interior Geospatial Information Officer collaborated to convene a workshop for the express purpose of identifying data and technology needed for a national network of LCCs

Workshop Purpose and Objectives

A. Purpose

The purpose of the workshop was to identify the data and technological capacities needed to develop the foundation for a national network of LCCs.

B. Objectives

Develop consensus on the shared information needed to support a national network of LCCs in conjunction with the CSCs

Agree to strategic directions and guiding principles

Identify common and unique requirements to ensure success of each LCC and the network as a whole

Develop a high level plan and agree to a set of priority actions

Ensure alignment with other efforts related to data and information needed for a national network

Participants

A. Partner Representation

Workshop participants included representatives of Interior bureaus, other Federal agencies, States, academic institutions, and non-governmental entities. In attendance were Interior leaders responsible for nationwide implementation, as well as field-staff working on implementation of individual LCCs. A complete list of participants is available on the LCC Workshop Website.

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Category	Organization
Federal Agencies and Departments	Department of Interior (DOI): Bureau of Land Management (BLM), Fish and Wildlife Service (FWS), Minerals Management Service (MMS), National Park Service (NPS), Office of Surface Mining (OSM), Bureau of Reclamation (Reclamation), U.S. Geological Survey (USGS), DOI's Geospatial Information Officer and Office of Policy Analysis; National Aeronautics and Space Administration (NASA); National Oceanic and Atmospheric Administration (NOAA); and the U.S. Department of Agriculture (USDA): US Forest Service
State and Academic Institutions	State of Virginia, State of Wisconsin, the Association of Fish and Wildlife Agencies (AFWA), the Western Governors' Association (WGA), Illinois Natural History Survey, and Mississippi State University
Non-governmental entities	American Bird Conservancy, National Fish Habitat Action Plan (NFHAP), NatureServe, National Ecological Observatory Network, and The Nature Conservancy (TNC)

B. The Interior Leadership Panel (opening and closing sessions only)

Panel Member	Title
Deanna Archuleta	Deputy Assistant Secretary for Water and Science (opening session only)
Tom Armstrong	Senior Advisor for Climate Change, Office of the Deputy Secretary
Dan Ashe	Deputy Director, FWS (closing session only)
Suzette Kimball	Deputy Director, USGS
Paul Schmidt	Assistant Director for Migratory Birds, FWS
John Tubbs	Deputy Assistant Secretary for Water and Science (closing session only)

C. LCC Coordinators and Presenters

The following individuals represented and presented, or spoke for, LCCs:

Organization	Representative
FWS	Jeff Burgett , Yvette Converse, Jim Dick, Mima Falk, Cheryl Hickam, Rex Johnson, Rick Kearney, Melinda Knutson, Mary Mahaffy, Andrew Milliken, Karen Murphy, Deborah Rocque, Bill Uihlein
BLM	Nora Devoe
Reclamation	Avra Morgan, David Raff
Illinois Natural History Survey	Brian Anderson

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Organization	Representative
NPS	Joe DeVivo
USGS	Sean Finn
State of Virginia	David Whitehurst
State of Wisconsin	Jack Sullivan

D. Climate Science Center Representatives

The following individuals represented and presented, or spoke for, CSCs:

Topic	Representative
National Climate Change and Wildlife Science Center	Robin O'Malley, USGS
Southeast Region	Sonya Jones, USGS
Northwest Region	Nancy Lee, USGS
Alaska	Stan Smith, USGS

Workshop Summary

The workshop agenda was adjusted as events unfolded. Thus, the event summary below is substantially different from the agenda distributed prior to the workshop. Many of the Powerpoint presentations and products developed during the workshop are available on the LCC Workshop Website.

DAY 1, March 30, 2010:

Morning Session

- Welcome, Introductions, and Overview by Karen Siderelis, Interior Geospatial Information Officer, and Bill Uihlein, Coordinator of the Lower Mississippi Valley JV
- Leadership Panel: Opportunities for an LCC national network
 - Deanna Archuleta, Tom Armstrong, Suzette Kimball, and Paul Schmidt
- LCCs Roundtable I: Goals and Challenges

Afternoon Session

- LCCs Roundtable II: Goals and Challenges
- CSC Roundtable: Goals and Challenges
- Building State and Federal Partnerships for Increased Scientific Capacity within LCCs and CSCs – To hear views and open a dialog with States about the future of LCCs. Presentations by:

LCC Workshop Website

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Organization	Representative
Association of Fish & Wildlife Agencies	Arpita Choudhury
NatureServe	Mary Klein
State of Virginia	David Whitehurst
Western Governors' Association	Madeleine West
State of Wisconsin	Jack Sullivan

- Open discussion among participants on opportunities for collaboration, principles that will guide the LCC national network in developing shared approaches, and clarification of the purpose and expected outcomes of the workshop

DAY 2, March 31, 2010:

Morning Session

- Presentation by Steve Fancy, NPS: "Strategic Dimensions of Interior Data Integration" - Description of emerging Interior efforts involving inventory and integration of data to be considered by the LCC national network and workshop participants
- Presentation by Bill Uihlein, FWS: "A Preliminary Assessment of Needs for the LCC National Network" - Findings of a preliminary LCC needs assessment
- Break-Out Session #1: "Refining and Prioritizing LCC Needs and Requirements." Four break-out groups focused on: 1) data and databases; 2) analytical and scientific capabilities; 3) collaboration tools, and 4) executive tools. Following break-out sessions, each group reported out to all participants

Afternoon Session

- Break-Out Session #2: Five break-out groups met to: 1) discuss issues that will impact the establishment of the LCC national network; 2) identify short term and long term opportunities for success; 3) clarify roles of Interior bureaus and partners; and 4) discuss potential future workshop recommendations. Following break-out group discussions, the groups reported out to all participants.
- Roundtable: "A Sampling of Innovative Solutions and Future Directions":

Topic	Organization	Representative
NOAA National Climate Service	NOAA	Chet Koblinsky
Science Data Integration	USGS	Stan Smith
Climate Data Delivery	USGS	Nate Booth
WGA Decision Support Pilots	WGA	Madeleine West

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http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

DAY 3, April 1, 2010:

Morning Session

- From among priority actions that participants identified, participants voted on the degree to which each would support a national network of LCCs
- Break-out groups were formed to develop draft scopes of work for the six highest ranking actions. These included:
 - Integrate national conservation initiatives into the LCC Network
 - Develop Interior outreach strategy and marketing plan for LCCs
 - Determine benchmark functionality for modeling priority LCC resources
 - Implement Secretarial Order advisory staff group
 - Determine information needs, existing tools and Science information gaps to support the LCC Network
 - Coordinate future workshop to address a data management strategy for LCCs and CSCs

Afternoon Session

- Leadership Panel: Workshop report to the panel by Bill Uihlein, panel feedback, and discussion
 - Tom Armstrong, Dan Ashe, Suzette Kimball, Paul Schmidt, and John Tubbs
- Reporting out by break-out groups that met to develop scopes-of-work, and discussion of follow-up work after the Workshop

Workshop Outcomes

A. Pre-Workshop Products

Two analyses were conducted prior to the workshop. The first effort was an identification of LCC data needs as described in the Operational Plans developed by the nine initial LCCs. A sample of this analysis is show in Table 1. The full analysis is included in Appendix A.

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Table 1. A Sample of the Preliminary Analysis of LCC Data Needs Based on a Review of LCC Operational Plans. (Xs indicate operational plans which include each need.) By Andrey Andreyev, FWS Div. of IRTM, February 2010									
Data and Information Needs	Arctic LCC	California LCC	Great Northern LCC	Great Plains LCC	Gulf Coastal Plains and Ozarks LCC	North Atlantic LCC	Pacific Islands LCC	Plains and Prairie Potholes LCC	South Atlantic LCC
Ecosystem models	X				X		X		X
Scaled-Down Climate Data and Models	X		X		X	X	X	X	X
Sea Level Rise Assessment	X				X	X	X		X
Data Integration and collaboration	X		X			X	X	X	X
PRISM climatology - http://prism.oregonstate.edu/	X								
Weather Research and Forecasting (WRF) - http://wrf-model.org/index.php	X								
ECHAM5 Model - http://www.mpimet.mpg.de/en/wissenschaft/modelle/echam/echam5.html	X								

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

The above analysis was sent out to the LCC Coordinators as a reference. They were then asked to identify needs that would support a national network of LCCs. They were also asked to rank those needs as being of high, moderate, low, or unknown relevance to a national network of LCCs. A sample of this analysis is show in Table 2. The full analysis, which is extensive and includes additional information, is available on the LCC Workshop Website at

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/power_points/uihlelnlccn_science_and_needs_assessment.ppt

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Table 2. A Sample of the Pre-Workshop Analysis and Ranking of Science and Technology Needs Identified to Facilitate a national network of LCCs. By Bill Uihlein, Interim Coordinator for the Gulf Coastal Plains and Ozarks LCC, and other LCC Coordinators, March, 2010				
Science and Technology Needs Identified To Facilitate A National Network Of LCCs	Relevance (% Among Responses)			
	High	Moderate	Minimal	Unknown
Landscape simulation models (e.g., LANDIS) that predict spatial and temporal dynamics of landuse-landcover under alternative scenarios (e.g., climate change, urban growth, energy development).	82%	14%	5%	0%
Consistent secured (protected) lands spatial data system that allows assessment of lands and habitat types in the conservation estate. Should include conservation easements. Should be updated annually. Needed for analysis of how well habitats are represented in the conservation estate	82%	9%	9%	0%
National LCC/I&M database (maintenance to be conducted by LCC or Science Coordinator/s) to facilitate information sharing between agencies/partners, cross-LCC project and model development, and needs assessments.	77%	14%	5%	5%
Consistent landuse-landcover classification and mapping using common Ecological Systems or similar nationally consistent classification system, ideally with 5 year updates	73%	27%	0%	0%
National coordination and integration of regional data centers for biological monitoring data. To address major ecological stressors such as climate change and energy development, biological monitoring data needs to be collected and analyzed over multiple geographic and temporal scales, suggesting that some level of national coordination will be required, along with appropriate data management and integration capabilities at multiple scales. A series of linked regional data management centers that each serve a small number of LCCs and are coordinated as a national system would help address this need.	73%	18%	9%	0%

LCC Workshop Website

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B. Workshop Products

Highlights of workshop products are described below. Detailed products and the results of breakout sessions are available on the LCC Workshop Website.

Key Messages

In addition to information related to data and technology, workshop products include insights from participants offered for consideration by Interior leadership. These key messages include:

Develop a consistent and clear message from Interior leadership about the LCC national network's purpose, functions, and relation to other efforts, including existing partnerships and the CSCs

Enhance shared access to national datasets while respecting data ownership, privacy, and security

Establish a national data sharing network that includes minimum data and modeling standards for all LCCs

Improve downscaled climate modeling for key variables including temperature, precipitation, and sea level rise

LCC Needs to Support a National Network of LCCs

The workshop planning team presented the needs described in Table 2 to the workshop participants. Participants considered the list as a starting point and expanded it to define the needs that will enable LCCs to function as a seamless national network. This exercise resulted in a list of 76 needs divided into four categories: Data, Analytical Capabilities, Collaborative Tools, and Executive Tools. A sample of this list is shown in Table 3. The full list, which is extensive, is available on the LCC Workshop Website at

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/workshop_products/sessions_breakout_data_analytical_collaborative.xls

Table 3. A Sample of Needs Identified by Workshop Participants to Facilitate a National Network of LCCs
Data
National LCC/Inventory & Monitoring database (maintenance to be conducted by LCC or Science Coordinator/s) to facilitate information sharing between agencies/partners, cross-LCC project and model development, and needs assessments.
Consistent landuse-landcover classification and mapping using common Ecological Systems or similar nationally consistent classification system, ideally with 5 year updates. Should include attributes related to ecological quality.

Table 3. A Sample of Needs Identified by Workshop Participants to Facilitate a National Network of LCCs
Updated, complete and coordinated land cover data: National Land Cover Data (NLCD), National Wetlands Inventory (NWI), etc.
Analytical Capabilities
Landscape simulation models (e.g., LANDIS) that predict spatial and temporal dynamics of landuse-landcover under alternative scenarios (e.g., climate change, urban growth, energy development).
Sea level rise models that account for the dynamic nature of coastal systems. SLAMM is not generally considered to be adequate for predicting the impacts of sea level rise on marshes.
Downscaled models of temperature, precipitation and sea level rise at the scale of LCCs or smaller
Collaborative Tools
Database module of all relevant annual monitoring programs for species, habitats, and climate variables, including implementing agencies, Points of Contact, time series, etc.
The NCTC digital library that allows us (and LCC staff) to access journals but doesn't have the money to expand its license to include all the climate and modeling journals that LCCs will need access to (Nature, Journal of Climate, etc). Peeling off a bit for that would be a huge boon for the technical staffs of the LCCs, who need access to the literature.
Data portal for access to simulation model results, downscaled climate models, comprehensive tracking system data, landuse-landcover data and species vulnerability assessments at various spatial scales. Portal will facilitate serving of CSC and research products to LCC science teams. (i.e., one stop shop for all your biological planning and modeling needs)
Executive Tools
Develop interactive communications strategy focused on employees, partners, and other audiences as appropriate to raise awareness about these broad-based science partnerships in the context of priorities including our community's response to accelerating climate change, and engage members of the conservation community. Such a strategy would help us bolster our web presence, build broader partnerships and aggressively support our priority conservation work in this area relying on limited climate funding.

From the list of 76 needs, workshop participants developed a set of recommended tasks that should be considered as candidates for early implementation in support of the national network of LCCs. The recommended near-term tasks are presented in Table 4.

Participants also identified six of these tasks as high-priority, discussed each in break-out sessions, and developed an impromptu, preliminary scope of work for each. The participants also identified a draft list of individuals who are willing to serve on post-workshop teams to further develop the tasks and scopes of work. The scopes of work, including volunteers, are available on the LCC Workshop

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Website at

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/workshop_products/scopes_of_work_combined.doc

Number	Title/Description
1	Integrate existing national conservation initiatives and partnerships, including State Wildlife Action Plans (SWAPs), JVs, NFHAP, and TNC Ecoregional Assessments, into the LCC network
2	Develop an outreach strategy/marketing plan to ensure (a) that a consistent message is being communicated and (b) that partners, agencies, and leadership understand the vision, mission, and goals of LCCs and CSCs
3	Assemble the data and models to project future resource states in priority resources, with the goal of achieving benchmark functionality for modeling priority LCC resources
4	Inventory information needs, existing tools, and science information gaps
5	Form a data council and hold a workshop to determine data requirements that would inform a national network of LCCs
6	Establish a group of bureau detailees, reporting to the Energy and Climate Change Task Force, responsible for developing a working framework for Interior Secretarial Order 3289
7	Provide access to national data products for the LCC network. Specific products include a) data about protected areas and b) Natural Heritage data
8	Advance a national approach to vulnerability assessment by a) publishing a Interior-wide vulnerability assessment guide and b) conducting a consistent, coarse scale assessment across all LCCs
9	Advance a national approach to predictive modeling by designing and implementing a coarse scale predictive model (such as the ecological assessment and scenario planning for the midcontinent) that can be applied uniformly across the national network of LCCs
10	Develop a strategy for coordinated national monitoring
11	Develop a scope of work for an LCC web portal
12	Develop a strategy for use of video teleconferencing to support communication and collaboration across the national network of LCCs
13	Enhance the FWS Information Technology network to improve performance

In Closing

The members of the workshop planning team thank all the people who helped make this workshop a reality. Many gave of their time, energy, creativity, experience, and travel resources. We offer a

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

special thank you to the National Conservation Training Center (NCTC) for their hospitality and efforts in support of the workshop.

Also, we invite readers of this document to visit the LCC Workshop Website. In addition to the materials presented herein, the website offers participants' presentations and products of the various break-out groups. These materials provide the context for the materials mentioned in this report.

The Workshop Planning Team		
Name	Organization	Title
Doug Beard	USGS	Interim Director National Climate Change & Wildlife Science Center
Al Fisher	FWS	Chief - Branch of Data and Systems Services and Chief Architect
Vivian Hutchison	USGS	Director of Metadata Management – National Biological Information Infrastructure Program
Chris Lett	FWS	National GIS Coordinator
Kim Magraw	Interior	Program Analyst, Office of Policy Analysis
Mike Millard	FWS	Director of the Fish Technology Center at the NE Fisheries Center
Robin O'Malley	USGS	Policy and Partnership Coordinator, National Climate Change and Wildlife Science Center
Karen Siderelis	Interior	Geospatial Information Officer
Bill Uihlein	Lower Mississippi Valley JV	Coordinator
John Wenburg	FWS	Deputy Science Advisor – Acting; Director of Conservation Genetics Laboratory, Alaska Region

Appendix A. Preliminary Analysis of LCC Data Needs Based on a Review of LCC Operational Plans.

Appendix A. Preliminary Analysis of LCC Data Needs Based on a Review of LCC Operational Plans. (Xs indicate operational plans which include each need.) By Andrey Andreyev, FWS Div. of IRTM, February 2010									
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Ecosystem models	X				X		X		X
Scaled-Down Climate Data and Models	X		X		X	X	X	X	X
Sea Level Rise Assessment	X				X	X	X		X
Data Integration and collaboration	X		X			X	X	X	X
PRISM climatology - http://prism.oregonstate.edu/	X								
Weather Research and Forecasting (WRF) - http://wrf-model.org/index.php	X								
ECHAM5 Model - http://www.mpimet.mpg.de/en/wissenschaft/modelle/echam/echam5.html	X								

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Population-habitat models that describe the distribution and abundance of priority species	X			X					X
Baseline demographic and habitat condition data		X	X	X	X		X		X
Spatially-explicit land-cover database			X						
Document species movement areas			X						
NWI Geospatial Data Acquisition and Assemblage - http://www.fws.gov/wetlands/			X	X	X			X	
Climate change scenario planning - http://www.ipcc-data.org/ddc_climscen.html			X	X			X		
Tools for the integration of climate change into effective conservation delivery			X	X	X	X	X	X	X
Statistically valid monitoring data	X	X	X	X	X	X	X	X	X
National Land Cover Dataset (MRLC) - http://www.mrlc.gov/					X				X

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Forest Inventory and Analysis data (USFS) - http://fia.fs.fed.us/					X				
National Hydrography Dataset (USGS) - http://nhd.usgs.gov/					X				
National Elevation Dataset (USGS) - http://ned.usgs.gov/					X		X	X	
U.S. General Soil Map (NRCS) - http://soils.usda.gov/survey/geography/statsgo/					X				
Landscape simulation models (e.g., LANDIS) - http://www.landis-ii.org/					X				
Hydrologic modeling					X	X		X	X
Seamless land cover dataset					X				
Integrated Forest Management Database					X				
Spatial and temporal patterns of housing growth - http://www.mrlc.gov/nlcd.php					X	X		X	

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NRCS National Resources Inventory (NRI) - http://www.nrcs.usda.gov/technical/NRI/						X			
Eastern Forest Environmental Threat Assessment - http://www.forestthreats.org/						X			X
NPS Inventory and Monitoring Program - http://science.nature.nps.gov/im/index.cfm						X			
Remote sensing data, particularly light detection and ranging (or LiDAR) data - http://www.ngs.noaa.gov/RESEARCH/RSD/main/lidar/lidar.shtml						X	X	X	
Modeling of population processes in stream networks						X			

LCC Workshop Website

http://training.fws.gov/csp/Resources/csp_climate_change_series/lcc_workshop/march_10/index.html

Appendix A. Preliminary Analysis of LCC Data Needs Based on a Review of LCC Operational Plans. (Xs indicate operational plans which include each need.) By Andrey Andreyev, FWS Div. of IRTM, February 2010									
Data and Information Needs	Arctic LCC	California LCC	Great Northern LCC	Great Plains LCC	Gulf Coastal Plains and Ozarks LCC	North Atlantic LCC	Pacific Islands LCC	Plains and Prairie Potholes LCC	South Atlantic LCC
Soil Survey Geographic (SSURGO) Database - http://soils.usda.gov/survey/geography/ssurgo/								X	
Interferometric Synthetic Aperture Radar (IFSAR) - http://www.csc.noaa.gov/crs/rs_apps/sensors/ifsar.htm								X	
Historic rate of change models									X
Literature and data locations library									X
Patterns of genetic divergence			X	X	X	X		X	X

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