



UPPER MIDWEST AND GREAT LAKES  
LANDSCAPE CONSERVATION COOPERATIVE

PROPOSED PRIORITIES  
FOR SCIENCE AND  
COLLABORATION

OCTOBER 2012

## EXECUTIVE SUMMARY

A successful Landscape Conservation Cooperative (LCC) relies on a vision, mission, and a clear set of shared conservation priorities. In early 2012, the Upper Midwest and Great Lakes Landscape Conservation Cooperative initiated a process to identify those priorities. Researchers from the University of Illinois interviewed key LCC members regarding the LCC's role in conservation, including what the partnership should prioritize. The researchers identified both a science and coordination role for the LCC and a large number (>150) of potential priorities.

Analyzing the data further, the LCC Technical Core Team developed a shortened list of science and coordination priorities to propose to the LCC Steering Committee.

Proposed science priorities (Section I) include:

- Assessing terrestrial and aquatic connectivity
- Conservation of species at a landscape scale
- Climate change adaptation for fish, wildlife, and natural resources
- Quantifying and communicating ecosystem services
- Energy development and landscape change

Proposed coordination priorities (Section II) include:

- Information management, delivery, and communication
- Using regional assets for relating science, management, and policy
- Emerging conservation issues
- Regional conservation efforts

A final list of priorities will be decided by the LCC Steering Committee. This document assists that discussion by describing each priority proposed by the LCC Technical Core Team. The “*Why?*” section provides a general definition and brief statement of need. The “*What?*” section provides examples of potential actions for each priority statement. Lastly, the “*Current LCC Investments*” section lists ongoing LCC actions that fall within the realm of each proposed priority.

With concurrence from the LCC Steering Committee, the LCC would use the priorities to guide future investments – not only in terms of granting funding, but also in terms of investment of LCC staff time and resources. The LCC will continue to revisit shared conservation priorities as the partnership evolves.

## SECTION I: SCIENCE PRIORITIES

### ASSESSING TERRESTRIAL AND AQUATIC CONNECTIVITY

#### WHY?

Landscapes with a higher degree of connectivity support more resilient systems. Connected landscapes facilitate a greater movement of genes, individuals, populations, and communities in an era of increased climatic and landscape change. The Upper Midwest and Great Lakes conservation community desires the maintenance of key landscape connections and restoration of connections that have been severed in the past, but lacks the means to assess connectivity at many scales.

#### WHAT?

Measuring and assessing connectivity across large landscapes requires numerous data elements currently not available to the scientific community. For example:

- Consistent regional land use/cover data using a classification system relevant to ecological analysis
- Locations and attributes of barriers to terrestrial movement (e.g., roads or incompatible land uses)
- Consistent regional stream network data with attributes necessary to assess habitat for aquatic species
- Locations and attributes of in-stream barriers
- Locations and attributes of barriers to gene flow

Using these data elements, researchers can map the connections between important landscape features, such as:

- Protected areas

- Distinct populations of species (i.e., meta-populations)
- Barriers to species annual- and life-cycle movements
- Areas projected to serve as refugia

#### CURRENT UMGL LCC INVESTMENTS

- Improving and updating National Wetland Inventory data
- Reestablishing ecological connectivity between the Great Lakes and their tributaries: prioritization in a complex system
  - Mapping the location and attributes of aquatic barriers (i.e., dams and road-stream crossings)
  - Assessing the ability to restore connectivity between the Great Lakes and their tributaries for a couple of fish species
- Prioritizing migratory bird habitat along Great Lakes shorelines
- Scenarios for forest reserve expansion and adaptive management under alternative climate change scenarios in the northern Great Lakes region
- Full life-cycle vulnerability assessments for the birds of the Upper Midwest and Great Lakes region
  - Mapping connectivity between breeding and wintering populations



## CONSERVATION OF SPECIES AT A LANDSCAPE SCALE

### WHY?

Conservation of species at a landscape scale increases the efficacy of actions when conserving entire species populations or working toward regional species objectives. Conservation of species often occurs at local scales. Sometimes these actions are coordinated regionally, but often they are not. The Upper Midwest and Great Lakes conservation community lacks the regional planning, conservation designs, implementation strategies, and monitoring protocols to conduct conservation for many species at landscape scales.

### WHAT?

Conservation of species at the landscape scale will require investigation and efforts in:

- Identification and prioritization of species in conservation need
- Identification of species population limiting factors and vulnerabilities
- Consistent and meaningful population objectives
- Species population abundance and habitat distribution mapping
- Development of decision support tools that compare management scenarios
- Development and implementation of monitoring protocols to track conservation actions and species response to management

### CURRENT UMGL LCC INVESTMENTS

- Identification of the most climate vulnerable terrestrial species in the Upper Midwest and Great Lakes LCC
  - Identified terrestrial species deemed of concern in the LCC region

- Prioritizing migratory bird stopover habitat along Great Lakes shorelines
- A regional decision support tool for identifying vulnerabilities of riverine habitat and fishes to climate change
- Full life-cycle vulnerability assessments for the birds of the Upper Midwest and Great Lakes region
- Avian response to climate change
- Predicting climate change effects on riverine aquatic insects using museum data and niche modeling
- Reestablishing ecological connectivity between the Great Lakes and their tributaries: prioritization in a complex system
- Great Lakes Information Management and Delivery System



## CLIMATE CHANGE ADAPTATION FOR FISH, WILDLIFE, AND NATURAL RESOURCES

### WHY?

Rapidly accelerated climate changes are impacting fish, wildlife and natural resources in the region. Resource managers will be required to manage

differently as these changes occur. Accumulation of carbon dioxide and other greenhouse gases in the atmosphere are a main cause and under the best case scenario – maximum greenhouse gas mitigation – the world’s climate is still projected to change at an accelerated rate. These changes have the potential to impact species and habitats in multiple ways – from exacerbating current threats (e.g., nutrient and sediment loading to streams) to creating “no analog” conditions in which natural communities will have different assemblages than the recent past. The Upper Midwest and Great Lakes conservation community needs additional knowledge and tools to adapt as the climate changes.

#### WHAT?

Developing strategies for climate change adaptation in the region requires investment in, but not limited to:

- Climate change vulnerability assessments
- Scenario modeling
- Decision support and communication tools
- Spatially explicit data of climatic variables necessary for ecological assessments

#### CURRENT UMGL LCC INVESTMENTS

- Regional downscaled climate data
- Identification of the most climate vulnerable terrestrial species in the UMGL LCC
- Climate adaptation recommendations for site managers
- A regional decision support tool for identifying vulnerabilities of riverine habitat and fishes to climate change
- Scenarios for forest reserve expansion and adaptive management under alternative climate change scenarios in the northern Great Lakes
- Avian response to climate change

- Full life-cycle vulnerability assessments for birds of the Upper Midwest Great Lakes region
- Predicting climate change effects on riverine aquatic insects using museum data and niche modeling
- Characterizing projected extreme weather events
- Developing fish trophic interaction indicators of climate change for the Great Lakes

### QUANTIFYING AND COMMUNICATING ECOSYSTEM SERVICES

#### WHY?

The benefits of conservation actions go beyond the direct impacts to natural resources. The conservation community understands the ecological benefits of landscape conservation, but has only basic knowledge of the additional benefits provided in services to the public. Growing and communicating this knowledge, provides justification for conservation actions in ways the public can better understand (e.g., economic metrics). Measuring and communicating information about ecosystem services, the conservation community can garner greater support for conservation from the public.

#### WHAT?

Increasing support for conservation through quantifying and communicating ecosystem services includes, but is not limited to:

- Mapping and visualizing the locations and values of services across the landscape
- The feasibility of Payments for Ecosystem Services (PES) programs
- Understanding public perceptions about ecosystem services
- Tracking conservation actions and identifying values in terms of ecosystem services

## CURRENT UMGL LCC INVESTMENTS

- None to date (although many of our current investments provide the baseline for examining ecosystem service concepts)

## ENERGY DEVELOPMENT AND LANDSCAPE CHANGE

### WHY?

Energy development is having direct impact on the regions natural resources and landscape. Human population increases in North America and the world are creating demand for increased energy production. This increase is coming in the form of greater exploration of traditional sources (e.g., coal and gas) and using newer technologies to extract additional energy from non-traditional sources (e.g., wind, solar, biomass). In the UMGL LCC region, wind turbines are being built and directly impacting birds, bats, and the landscape. Interest exists to build wind energy facilities in the Great Lakes coastal zone and the off-shore waters. Potential impacts (positive and negative) also exist for biomass and shale-gas extraction. Understanding the impacts energy production has directly on natural resources and the landscape allows natural resource managers and the energy development community to work together to minimize those impacts while meeting energy demands.

### WHAT?

Understanding the consequences of energy development on natural resources and landscape change requires, but is not limited to:

- Mapping locations of current and projected energy development
- Focused research on the impacts of near- and off-shore wind turbine placement to natural resources
- Developing data and information to help inform design and siting of energy development

## CURRENT UMGL LCC INVESTMENTS

- Prioritizing migratory bird habitat along the Great Lakes shoreline



## SECTION II: COORDINATION PRIORITIES

### INFORMATION MANAGEMENT, DELIVERY, AND COMMUNICATION

#### WHY?

The conservation community faces a decision making environment that is complex. The community continues to invest in more scientific data and information often with minimal thought on how to best organize, deliver, and communicate knowledge to key decision makers. This process leads to a “fragmentation of information” devaluing the initial investment. To ensure the conservation community receives maximum benefit from their science investments, efforts must be made to organize, synthesize, and communicate knowledge in formats that are quickly accessed, easily understood, transparent, and trustworthy.

#### WHAT?

To ensure the conservation community receives maximum value from LCC science investments, the LCC must:

- Efficiently manage projects
- Manage data and knowledge produced through scientific investigations
- Develop a communication strategy for information and knowledge transfer
- Communicate goals
- Track progress towards goals

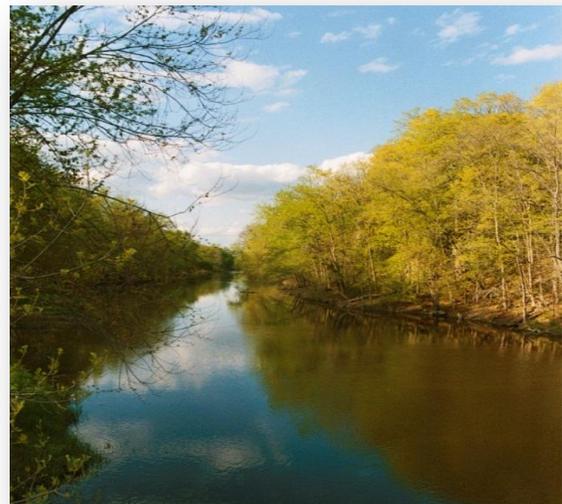
The LCC can facilitate the transfer of information via mechanisms, such as:

- Web-based information delivery systems
- Web sites
- Workshops/webinars/project reports

#### CURRENT UMGL LCC INVESTMENTS

- Great Lakes Information Management and Delivery System

- Climate Change Webinar series in partnership with The Ohio State University
- Organizing symposia at various science and natural resource management venues (i.e., Chicago Wilderness Congress and The Midwest Fish and Wildlife Conference)



### USING REGIONAL ASSETS FOR RELATING SCIENCE, MANAGEMENT, AND POLICY

#### WHY?

The capacity (e.g., staff, funding, etc.) for integrating science, management, and policy in the region often focuses on individual issues, within single agencies, and/or at small scales. Budget challenges for many agencies and organizations have resulted in a smaller overall conservation workforce and capacity. However, the conservation community still faces traditional and future conservation challenges. The conservation community must increase and improve the mechanisms and ability to identify key conservation assets and to make those current assets available to the broader conservation community.

## WHAT?

The LCC is strategically situated to assess the available capacity and provide mechanisms that can “free-up” those resources to work more broadly. The LCC can pursue techniques to make conservation assets available to a broader community via:

- Cooperative/interagency agreements
- Mechanisms to share staff
- Systems that locate and share data, conservation objectives, and knowledge

## CURRENT UMGL LCC INVESTMENTS

- Great Lakes Information Management and Delivery System
- Shared LCC/Joint Venture biologist

## EMERGING CONSERVATION ISSUES

### WHY?

Natural resources in the Upper Midwest and Great Lakes region continually face new and unfamiliar threats. Some of these emerging issues are landscape in scope impacting many agencies and organizations that make up the conservation community. As a regional forum, individual members of LCC can bring awareness to these issues to the broader conservation community with potential to quickly mobilize actions and response.

### WHAT?

The LCC can facilitate awareness of and coordinate the response to emerging conservation issues through mechanisms, such as:

- Emerging issues workshops and/or surveys
- Communication of emerging issues through reports/webinars/website

## CURRENT UMGL LCC INVESTMENTS

- None to date

## REGIONAL CONSERVATION EFFORTS

### WHY?

Threats to natural resources are creating conservation issues in the Upper Midwest and Great Lakes region that are far reaching in scope. No single agency or organization can achieve conservation objectives individually. Bringing the conservation community together around shared goals develops a greater capacity to leverage resources for action and communication of need. The LCC can be used as a regional venue to work on and coordinate regional conservation efforts.

### WHAT?

The LCC can serve as a venue to develop shared conservation goals and coordinate regional conservation efforts. For example, the LCC can take the lead role or assist in coordinating:

- Aquatic Habitat Connectivity Initiative
- Ensuring a common approach, where appropriate, to State Wildlife Action Plan revisions.
- Tribal involvement in regional conservation cooperatives

## CURRENT UMGL LCC INVESTMENTS

- Manajiwini: Respecting Tribes, First Nations, and cultural resources in cooperative landscape and climate change decision making
- Hosted Aquatic Habitat Connectivity Symposia at the American Fisheries Society Meeting
- Great Lakes Information Management and Delivery System