

Effective conservation through collaboration and sound science

2013 YEAR IN REVIEW



EASTERN TALLGRASS PRAIRIE & BIG RIVERS
LANDSCAPE CONSERVATION COOPERATIVE





TABLE OF CONTENTS

3 Landscape Conservation Cooperatives

4 Year in Review

6 Our Changing Landscape

9 Our Dynamic Growth and Progress

11 Building Communities of Science

17 Expanding our Reach

19 Research Spotlights

- *Watching Water Quality When it Matters Most: Evaluating Stream Sediment and Nutrients During Critical Times for Wildlife and People*
- *Understanding Landowner Incentives: Reducing Gulf Hypoxia and Helping Wildlife Impacted by Extreme Climate Events*
- *Layers of Big Muddy: Hydrogeomorphic Restoration of the Lower Missouri River*
- *Strip by Strip: Evaluating the Benefits of Prairie Vegetation to Pollinators, Water Quality and Bird Diversity in Row-Crop Agriculture*
- *Slow to Respond: Eastern Box Turtles Make their Way to Safety through Innovative Relocation Project*

27 Our Promising Future



LANDSCAPE CONSERVATION COOPERATIVES

Landscapes capable of sustaining natural and cultural resources for current and future generations

Protecting natural and cultural resources is essential to sustaining our health and quality of life. We, along with fish and wildlife, rely on these resources, however, the stressors impacting our environment have become too complex for any single agency or organization to effectively address.

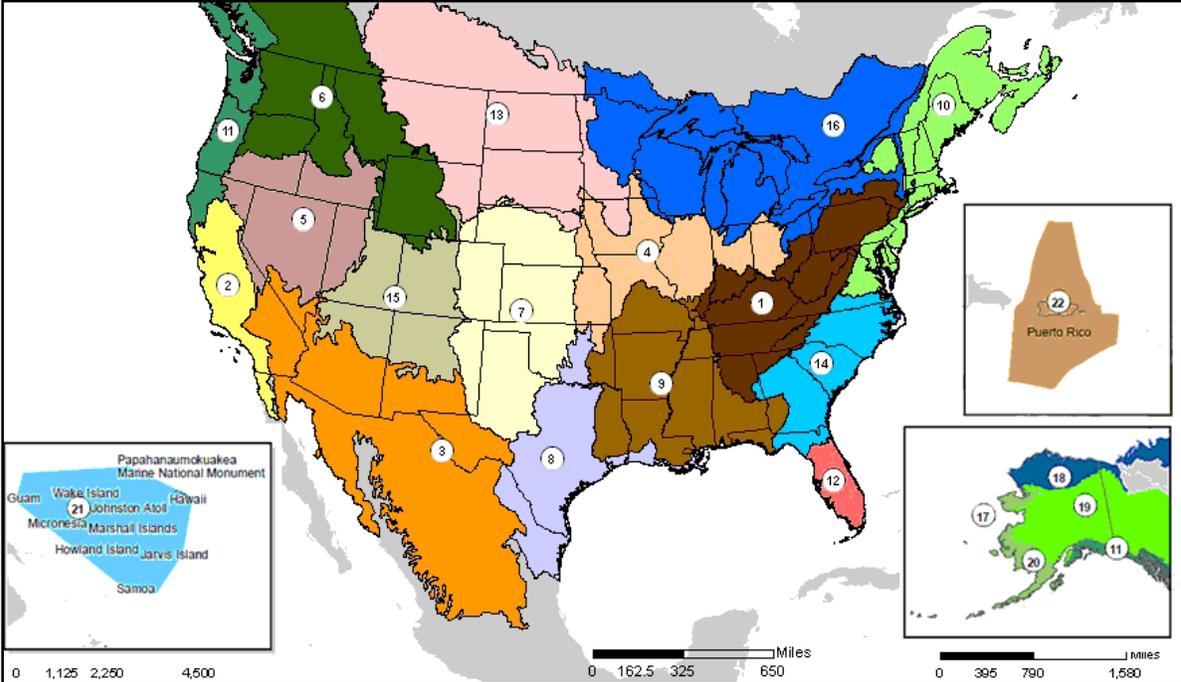
With the signing of Secretarial Order No. 3289, the Department of the Interior launched a network of 22 Landscape Conservation Cooperatives (LCCs) to better

integrate science and management to address broad-scale and complex natural resource challenges. By building a network that is holistic, collaborative, adaptive, and grounded in science, LCCs are working to ensure the sustainability of our economy, land, water, wildlife and cultural resources.

The 22 LCCs collectively form a network of resource managers and scientists who share a common need for scientific information and interest in conservation. Each

LCC brings together federal, state, and local governments along with Tribes and First Nations, non-governmental organizations, universities, and interested public and private organizations.

Our partners work collaboratively to identify best practices, connect efforts, identify science gaps, and avoid duplication through conservation planning and design. Learn more about the LCC network at <http://lccnetwork.org>.



Eastern Tallgrass Prairie and Big Rivers LCC geography. Graphic by Department of Interior.



YEAR IN REVIEW

Message from our Steering Committee Co-Chairs

In our early years, the Eastern Tallgrass Prairie and Big Rivers LCC established our identity as a community of conservationists working to build a common vision for the natural resources of our nation's Corn Belt. In 2013, with our mission and vision as a guide, we took action to build a working community of professionals across four key priority areas - prairie restoration, river restoration, agroecology and urban watersheds.

We organized a community of more than 265 researchers, scientists, managers and practitioners into working teams, and secured leadership from experts at the Illinois Natural History Survey to facilitate and guide each team. We named technical advisory groups to form the scientific backbone of our landscape conservation community, and over the next few months, they will work to identify and prioritize landscape conservation science needs, while continuing to showcase the LCC's value as a forum to identify and carry out opportunities for collaboration. Technical advisory group leaders drafted business plans detailing immediate science needs for each of these priority areas.

In addition to the efforts of our science teams, our steering committee came together on the banks of the Mississippi River in Dubuque, Iowa, this January to zero-in on one of the most complex

and broad-scale natural resources challenges impacting our nation – Gulf hypoxia. The cumulative expertise and energy of the LCC steering committee positions our partnership as a strong coordinator of and contributor to the ongoing efforts to reduce the downstream movement of nutrients from our Midwestern agricultural fields through the Mississippi River basin. By facilitating discussion and information-sharing and by pooling technical resources and expertise, we are bringing new perspectives and innovative solutions to existing partnerships dedicated to reducing

Gulf hypoxia and its economic and ecological impacts. We'd like to extend a special thank you to Iowa Department of Natural Resources for hosting this meeting.

As part of our role to provide a forum for collaboration, the LCC is organizing a Gulf Hypoxia and Wildlife Corridor Workshop to convene landscape conservation design experts and natural resource leaders in the Mississippi, Missouri and Ohio River basins. The workshop will take place in summer 2014 and will outline actions necessary to allow fish and wildlife to adapt to



Prairie coneflowers. Photo by Patrick Standish/Creative Commons.



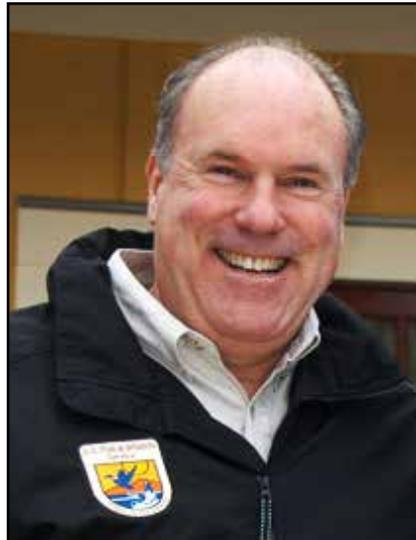
change in the center of the North American continent. Our partners have also contributed to design and funding of a suite of complementary research projects that illuminate directions for selection, siting and impacts of agricultural conservation and hypoxia.

We are also working across our LCC borders with the national LCC network to build our collective capacity to identify and distribute decision support tools for land and water resources managers across the nation. This Decision

Support Toolbox Workshop is being coordinated by our partners at the National Conservation Training Center.

Training the next generation of conservation leaders is a priority for all of our LCC partners. This year, we welcomed graduate students from Indiana University and the University of Minnesota to learn about the landscape conservation enterprise and provide a fresh perspective on engaging non-traditional audiences in the conservation dialogue.

The future is bright for the Eastern Tallgrass Prairie and Big Rivers LCC. The deepening commitment of our partner agencies and organizations is evidence of our success this past year. We are eager to continue promoting effective conservation through sound science, while ensuring conservation is relevant to generations today and tomorrow.



Charlie Wooley, Deputy Regional Director, U.S. Fish and Wildlife Service - Midwest Region



Marc Miller, Director, Illinois Department of Natural Resources



Our Changing Landscape

*Our LCC is dedicated to supporting effective conservation within the **working landscape** of America's **heartland***

Through the center of North America, tallgrass prairie once covered 170 million acres. These grasslands and associated wetlands and forests supported a staggering diversity of flora and fauna.

The Mississippi, Missouri, Illinois, Platte and other big rivers cut through the prairie landscape, once carrying Native American traders and early explorers. These travelers crossed the continent, describing channels, sloughs, forests, and marshes as overflowing with waterfowl, fish, mussels and other aquatic life, traversing wide open grasslands like ocean currents.

Over the course of the 19th and early 20th centuries, the tallgrass prairie was slowly and systematically plowed under and paved over for agricultural and urban development. Today, less than 0.1 percent of the prairie remains scattered across the region in relatively small, fragmented remnants.

In the course of feeding our growing nation, marshes were drained, fields were tilled, waterways were straightened, and rivers were dammed. Habitats were destroyed and degraded and wildlife suffered the consequences.



Dawn in Loring, Iowa. Photo by Carl Wycoff/Creative Commons.

Today, the midwestern United States is a working landscape with agricultural products providing the economic backbone of the region. The region has more than 400,000 farms and is a major producer of corn, soybeans, fruits, vegetables and livestock.

Large urban centers like Chicago, Indianapolis, Columbus, St. Louis, Kansas City and Des Moines provide places for millions of people to live and work. Manufacturing and service sector jobs found in large cities anchor the economy as well. Big rivers provide a source of transportation to ship grain, coal and other products across and out

of the region. The Mississippi River basin covers nearly 800 million acres of land, and according to the U.S. Department of Agriculture, agricultural interests reliant on the basin contribute up to \$54 billion dollars annually to the U.S. economy. Wildlife-related recreation—hunting, fishing, and wildlife watching—in Illinois alone totaled \$3.8 billion in 2011.

Embedded in this working landscape, there are many scattered areas—both large and small—of habitat vital to a diversity of aquatic and terrestrial wildlife on both public and private lands. These valuable pockets of biodiversity continue to



We are **leveraging resources** across *the Mississippi basin to reduce Gulf hypoxia*

be under stress from climate change, invasive species, urbanization, agriculture nutrient and sediment run-off and habitat fragmentation.

Agricultural practices in the region have led to elevated nutrient loads in the form of nitrogen and phosphorous that are discharged into local waterways. A consequence of this has been not only poor local water quality in the Midwest, but also hypoxia a thousand miles downstream in the Gulf of Mexico.

Better known as the “Dead Zone,” areas of hypoxia occur where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support fish and other aquatic organisms. The Dead Zone significantly impacts the economic viability of Gulf Coast fisheries, while threatening the broader ecological integrity of the region.



Row crop agriculture. Photo by Carl Wycoff/Creative Commons.

*Mid-continent LCCs are **knitting together** a coordinated response to Gulf hypoxia*



Staff from the Upper Midwest and Great Lakes, Eastern Tallgrass Prairie and Big Rivers, and Plains and Prairie Potholes LCCs Photo by U.S. Fish and Wildlife Service.

The Eastern Tallgrass Prairie and Big Rivers LCC sits in the heart of the Midwest. From central Ohio, it stretches across parts of Indiana, Illinois, Iowa, Missouri and Minnesota all the way to eastern Nebraska, Kansas and Oklahoma.

One of a national network of 22 cooperatives, the LCC is a public-private partnership composed of state, tribal and federal agencies as well as non-governmental organizations, universities and others headed by program leaders and directors of these organizations.

Our partners recognize that conservation challenges transcend

political and jurisdictional boundaries and require a networked approach—holistic, collaborative, adaptive and grounded in science—to ensure the sustainability of North America’s land, water, wildlife and cultural resources.

Gulf hypoxia is a major symptom of landscape-level ecological stress; the cure for this can only be found with a concerted effort by conservation partners across the LCC. With sound scientific research and targeted conservation practices, species and habitats can and should rebound—both locally and a thousand miles downstream.



“Successfully implementing conservation requires working at a landscape level and collaborating with numerous partners, including landowners, and that is something that the Eastern Tallgrass Prairie and Big Rivers LCC partnership is able to do. By engaging with this partnership we hope to be able to improve water quality (both in the region and ultimately in the Gulf of Mexico), wildlife habitat, and the quality of life for people across the Midwest. It is always inspiring to see the passion and dedication that all of the LCC partners have in working collaboratively to try and improve this landscape for future generations!”

Ted LaGrange, Wetland Program Manager, Nebraska Game and Parks Commission



Shrimping boats off Dulac, Louisiana. Photo by Bart Allen Fields/Creative Commons.

Our Dynamic Growth and **Progress**



January 2013 Steering Committee meeting in Dubuque, Iowa. Photo by U.S. Fish and Wildlife Service.

A stone soup approach to **conservation**

The Eastern Tallgrass Prairie and Big Rivers LCC continues to provide a venue for sharing valuable resources and information.

Technical advisory groups are building on the draft LCC strategic plan to develop individual focal area business plans that outline high priority research and management to benefit both wildlife and people in the Mississippi basin.

We have brought together U.S. Geological Survey, U.S. Department of Agriculture, Mississippi River Basin Initiative partners, human dimensions experts, neighboring LCCs, and other valuable land and water managers to advance opportunities to reduce hypoxia

while improving habitat for wildlife across the basin.

Within this context, our steering committee this year identified priority areas for conservation that correspond to natural landscape elements and key habitats within the LCC geography. These are:

- **Prairie Restoration**
- **River Restoration**
- **Agroecology**
- **Urban Watersheds**



The Mississippi-Atchafalaya River plumes are visible here as they empty into the Gulf of Mexico. Photo by NASA/Creative Commons.



America's Grasslands Conference attendees discuss collaboration across six LCCs in Manhattan, Kansas. Photo by U.S. Fish and Wildlife Service.

Our strategic plan has benefited from significant input over the past year from more than 265 managers and researchers. The plan outlines initial goals, objectives and strategies for each of our four focal areas.

Alleviating Gulf hypoxia was identified as an overarching conservation need within our LCC strategic plan and was integrated into all four priority areas.

The plan lays out three operational frameworks for decision making adopted by our steering committee. These frameworks are strategic habitat conservation, structured decision-making and preliminary criteria for project selection.

These frameworks use pragmatic and science-based approaches that are based on prioritization of

conservation stressors within and across our four focal areas.

To provide more complete support for the development of our technical advisory groups, the LCC welcomed Jamie Ellis, Lama BouFajreldin, Susan McIntyre and Craig Miller from the Illinois Natural History Survey as lead technical advisory group coordinators to facilitate dialogue and project development.

In a first step toward directing future research funding, our technical advisory group leaders secured input from their members on a draft business plan, laying out priority actions for the LCC partnership.

Our growing community of conservationists continues to provide input into our draft business plan, which will guide future themes and

research projects to be supported through financial, technical or in-kind support from LCC partners.

Building communities of **SCIENCE**

Prairie Restoration

The heartland of North America was once covered with 170 million acres of tallgrass prairie. Over the last 150 years, prairie was plowed under for agriculture, and today, less than 0.1 percent of prairie remains as small, fragmented gems of biodiversity in the Corn Belt states.

From 2006 to 2011, soaring crop prices and biofuel mandates were among factors that prompted conversion of 1.3 million acres of grassland to corn and soybeans in five states. In parts of Iowa and Nebraska, rates of conversion were as high as 30 percent - a figure not seen since the Dust Bowl era of the 1930s.

Prairie remnants and the species they harbor continue to be stressed by fragmentation, invasive species, poor management practices, disturbance

from adjacent land use and continued outright destruction for row-crop agriculture.

With so little native prairie left, conservation of prairie needs to include re-creation of prairie habitats.

The goal of the Prairie Restoration Technical Advisory Group is to determine where and how to focus prairie restoration for biodiversity conservation. This includes restoration of large prairie ecosystems as well as protection of small remnants. It is hoped that protection of existing habitat and creation of carefully sited restorations will begin to stem the loss of species, particularly vulnerable groups like grassland- dependent birds.

Volunteers from across the region with first-hand technical and scientific expertise specific to prairie and

prairie management have agreed to participate in the formulation of a conservation plan for the LCC. Their first order of business this year was to help develop strategies to conserve and restore high-quality prairie.

Communication and dissemination of knowledge about successful prairie restoration is critical to effective conservation efforts. Members of the Prairie Restoration Technical Advisory Group will continue to meet, gather input and disseminate information in the coming year.



Sampling insects at Konza Prairie near Manhattan, Kansas. Photo by U.S. Fish and Wildlife Service.



River Restoration

The River Restoration Technical Advisory Group engages scientists and managers of federal, state, local, tribal and academic organizations to highlight research needs to restore big rivers (vistas), reconnect small rivers ecosystems (gems), increase lateral connectivity, and promote local stewardship to riverine ecosystems.

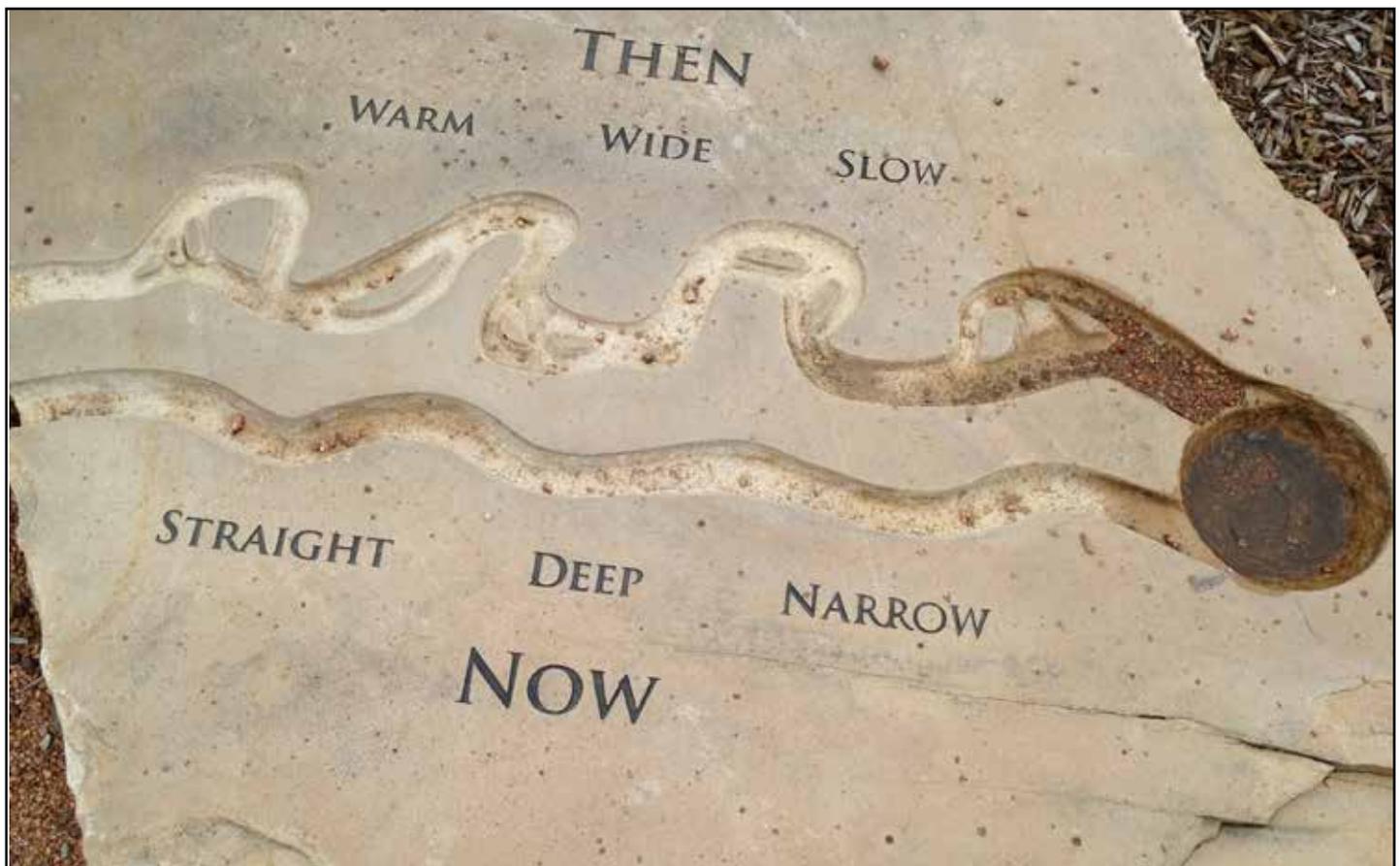
The team has elicited stakeholder views on major environmental stressors and science needs within the LCC geography to inform future funding efforts through the LCC partnership. Stakeholders perceived lateral connectivity, hydrological alterations, land use and invasive species as major environmental stressors in the

region, and recommended prioritizing restoration sites, modeling social values and physical site conditions, and promoting landowner awareness on restoration benefits as science needs for addressing these stressors. This science team also generated a business plan drafting the next steps for future investments by LCC partners.

The plan proposes the formation of two subgroups to narrow, define and write the scope to request research proposals, and, to review, score and recommend proposals for funding to the LCC steering committee.

The team has also coordinated a group of scientists from the U.S. Army Corps of Engineers,

University of Missouri, U.S. Fish and Wildlife Service, Plains and Prairie Potholes LCC, Upper Midwest Environmental Sciences Center and Floodplain Science Network, to discuss floodplain connectivity for the upper Mississippi River. The team plans to coordinate a workshop to identify optimal restoration sites and science needs for the upper Mississippi River.



Missouri River “Then & Now” sculpture at National Park Service headquarters in Omaha, Neb. Photo by U.S. Fish and Wildlife Service.



Old farm. Photo by Carl Wycoff/Creative Commons.

Agroecology

Over the past year, Agroecology Technical Advisory Group members prioritized limitations and research needs for conservation in agriculture within the LCC geography.

Stressors identified included conflict between conventional agricultural practices and conservation efforts. Primary impediments to conservation established were economics – funding for conservation is insufficient to compete with incentives for intensive corn and soybean production; education – lack of knowledge or motivation among producers to implement conservation practices; and uncertain benefit or inflexibility of conservation programs.

Primary research interests established by the team included ecological impacts of conservation practices, landowner motivations and incentives, mapping and

modeling conservation activities, and conducting social and economic analyses of conservation. With this information, the technical advisory group is better situated within the coming year to prioritize activities and resource application.

Some research needs are already being addressed though LCC support. These include the development of a searchable database of existing scientific literature, an assessment of water quality impacts of several agricultural practices, and research predicting relationships between climate change, agricultural practices, and water quality.

Additionally, a literature synthesis on landowner's incentives in participating in conservation programs currently underway through the University of Minnesota, will deepen our current understanding of the issue while

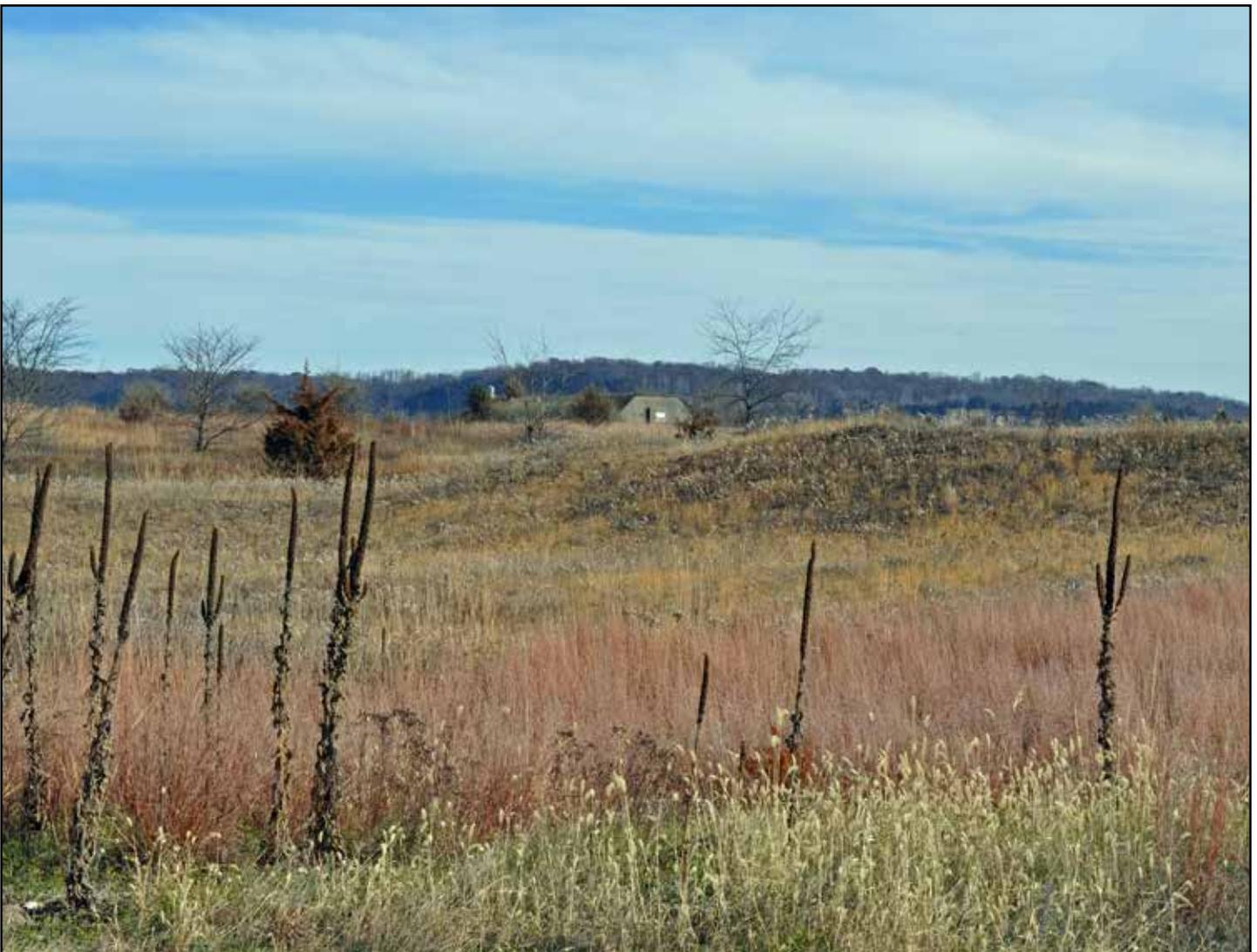
ongoing research into farmers' motivations sets the stage for the development of programs that encourage broader participation in best management practices.

With representation from a broad range of government, academic and nonprofit organizations, the Agroecology Technical Advisory Group is able to consider a multi-scale, multi-disciplinary approach to conservation in one of the most critical areas of the Midwest. The team will continue to share research, refine priorities, and designate action items in the coming year.



“The mission of Ducks Unlimited is conservation of waterfowl habitat. Because waterfowl are migratory and rely on habitat distributed throughout the entire continent, the only way we can be successful is to take a landscape approach to our work, guided by science-based strategic planning. The LCC helps us with that.”

David Brakhage, Director of Conservation Programs, Ducks Unlimited Great Lakes/Atlantic Regional Office



Sand prairie habitat. Photo by U.S. Fish and Wildlife Service.

Urban Watersheds

In 2012, 83 percent of the U.S. population was living in urban areas. As the population increases in urban areas so does residential and commercial development, consequently leading to potentially damaging impacts on wildlife habitat and ecosystems.

While conservation efforts have traditionally been focused in non-urban environments, there is a growing trend across the conservation community towards urban conservation as more and more people flock to large cities.

Big rivers connect urban populations within the LCC geography. This presents an opportunity for a

large-scale landscape conservation initiative through adoption of green infrastructure for water quality, quantity and flood control, while connecting people to nature through management initiatives that improve continuity of wildlife habitat and create migratory corridors.

Through the Urban Watersheds Technical Advisory Group, team members are planning the first Midwest Urban Conservation Workshop to understand stakeholder challenges, define research needs and identify best management practices, and establish a platform for collaborative conservation moving forward.

The workshop framework is focused on collective impact, emphasizing the linkages between upstream and downstream communities. Participants will include scientists, urban planners, and state, federal, private and nonprofit organizations with interests in creating a network of professionals interested in the economic, social, cultural and ecological value of our waterways.

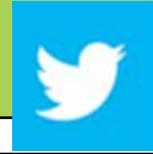


With more than 1.3 million visitors per year, Montrose Beach near Chicago is one of the most heavily used public beaches in Illinois. The 11-acre dune also provides important habitat for migratory birds and priceless opportunities for urban birding. Photo by U.S. Fish and Wildlife Service.



Boats in Chicago River, downtown Chicago, Illinois. Photo by Jeramey Jannene/Creative Commons.

Expanding Our REACH



The LCC launched its revamped Web site <http://www.tallgrassprairie.lcc.org> and online workspaces, with more than 4,300 individual site visits and more than 250 new site subscribers since initial launch. Online workspaces are available through registration by Steering Committee and Technical Advisory Group members.

In partnership with USGS Water Science Centers, the LCC announced the completion of a searchable natural resources database providing information related to agricultural practices, climate change and water quality across the Midwest.

The LCC also participated in a social media challenge alongside other Midwest LCCs, launching

a “Learn Your Landscape” social media campaign on Facebook and Twitter to educate the public about natural resources challenges and opportunities across the nation’s Corn Belt.

Planning for the first Midwest LCC Communications Network meeting this winter is underway. Communications Network members will be introduced to the purpose and value-added of LCCs across the Midwest landscape, and discuss the roles and responsibilities of the communications network to capitalize on shared resources to communicate about landscape scale natural resources issues.

The LCC participated in multiple stakeholder workshops and

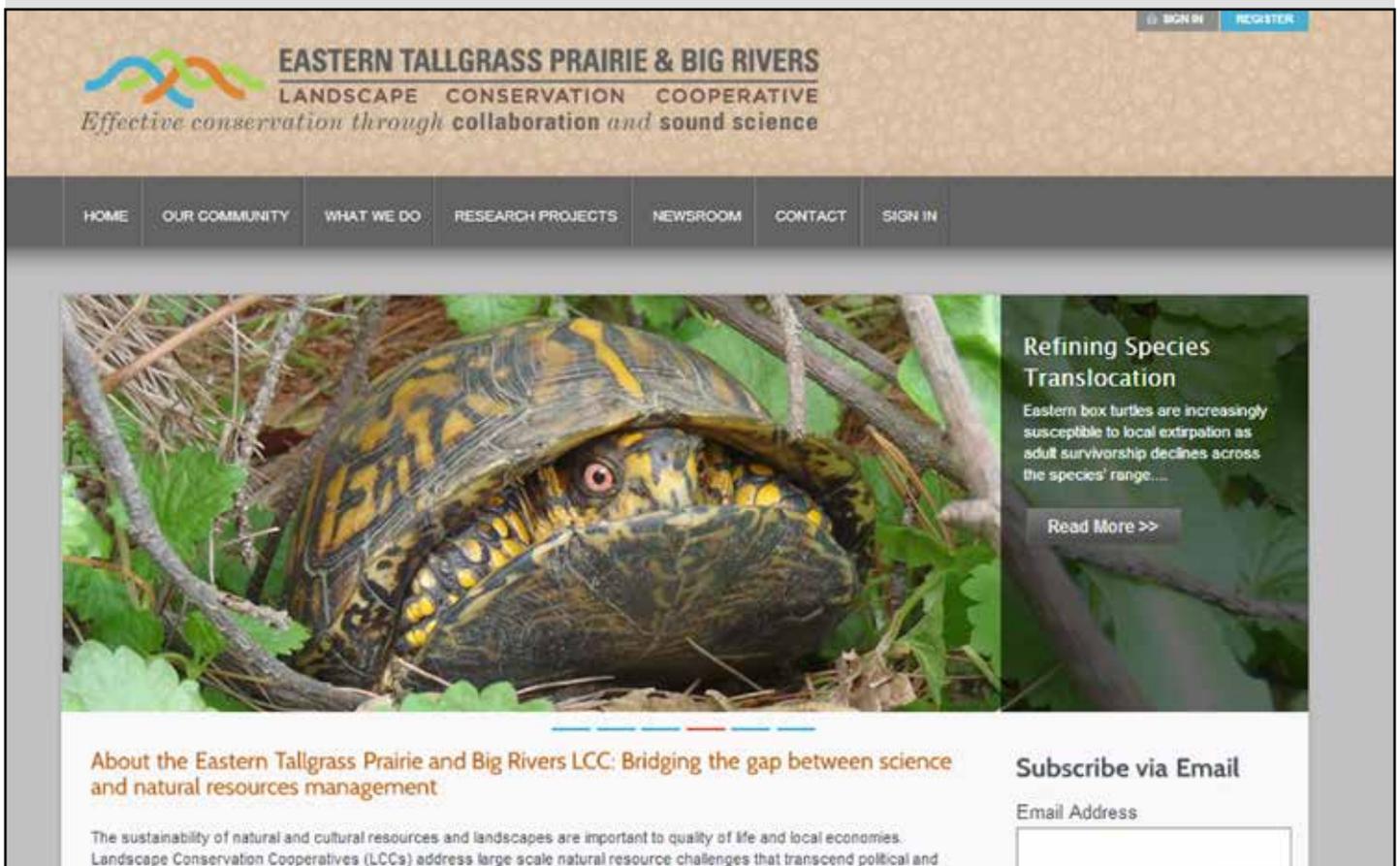
conferences to provide presentations on LCC activities and seek input on the LCC’s strategic plan. These conferences and workshops were led by Chicago Wilderness, Grassland Restoration Network and the Midwest Conservation Biomass Alliance. LCC staff also participated in the America’s Grasslands Conference alongside other Midwest LCC coordinators and science coordinators from seven LCCs with prairie interests extending from Canada to Mexico.

Communication is a **critical function of our partnership**

“Close partnership with LCCs is fundamental to achieving the mission of my program, the Northeast Climate Science Center. We were created, along with LCCs, to help develop and deliver the science, information, data and tools needed by natural and cultural resource managers. It has been very helpful to meet, hear the thoughts of LCC members and stakeholders, and learn what the landscape level conservation needs are and how to assist. I am very glad to be a part of this process, and feel like together we can make progress towards mutual goals.”

Mary Ratnaswamy, Director, Northeast Climate Science Center

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HOME OUR COMMUNITY WHAT WE DO RESEARCH PROJECTS NEWSROOM CONTACT SIGN IN

Refining Species Translocation

Eastern box turtles are increasingly susceptible to local extirpation as adult survivorship declines across the species' range....

[Read More >>](#)

About the Eastern Tallgrass Prairie and Big Rivers LCC: Bridging the gap between science and natural resources management.

The sustainability of natural and cultural resources and landscapes are important to quality of life and local economies. Landscape Conservation Cooperatives (LCCs) address large scale natural resource challenges that transcend political and

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Research HIGHLIGHTS

WATCHING WATER QUALITY WHEN IT MATTERS MOST

Evaluating Stream Sediment and Nutrients During Critical Times for Wildlife and People

Water quality is directly linked not only to the ecological health and biodiversity of a landscape, but also human and economic health in agriculturally dominated communities.

With support from the LCC, partners with U.S. Geological Survey Water Science Centers are working to evaluate stream sediment and nutrients during critical times for wildlife and people within the North Fork Maquoketa River Basin in Iowa, which typically has higher stream sediment and nutrient levels than surrounding areas.

This critical time includes when crops most need nutrients during

growing periods, as well as during key life stages where stream health is critical for fish and other wildlife.

From the Maquoketa Basin to the Gulf of Mexico, sediment and nutrients have an effect, with links to seasonal declines in water quality affecting Gulf fisheries and overall ecological health.

In addition to evaluating stream sediment and nutrients in the river basin, researchers are also assessing new water quality monitoring technologies, which use only light to provide clean, rapid, and continuous observations of water quality, compared to traditional laboratory water samples.

This LCC-supported research involves many conservation partners studying health of Midwest streams.

Though individual conservation practices used to improve stream sediment and nutrients in the Maquoketa Basin and the Midwest are effective during only certain times of the year, comprehensive conservation strategies based on this research can be developed to achieve the best water quality for multiple uses and when it matters most.



Farm and creek in Polk County, Iowa. Photo by Carl Wycoff/Creative Commons.



UNDERSTANDING LANDOWNER INCENTIVES

Reducing Gulf Hypoxia and Helping Wildlife Impacted by Extreme Climate Events



Approaching storm front over Midwest farms. Photo by Jeff Pang/Creative Commons.

Natural resources agencies and organizations throughout the Mississippi River basin have identified high nutrient runoff, a major contributor to Gulf hypoxia, and declines in wildlife populations as inter-related complex conservation challenges requiring collaborative action through the Landscape Conservation Cooperative network.

The USGS Upper Midwest Environmental Sciences Center, Purdue University and Oregon State University are leveraging financial and technical support provided by the Northeast Climate

Science Center to develop a spatial decision support system to identify watersheds within the Mississippi River basin where application of conservation practices can reduce nutrient export to the Gulf hypoxia zone and enhance conservation for grassland and riparian birds, based on identifying landowners who are willing and capable of implementing these practices.

The decision support system will identify appropriate conservation practices to be implemented, and quantify resulting benefits for both nutrient export and bird habitat.

The system will also enable analyses of whether landowner willingness to implement desired practices is affected by perceptions of climate extremes.

This pilot effort seeks to move current wildlife conservation approaches to a more strategic level by identifying where to locate conservation, restoration and management efforts in critical watersheds for the greatest overall benefit to both people and wildlife

“This is an important opening for us to engage in collaborative work with the LCC as well as the entire suite of LCCs working within the Mississippi River Basin, and also to expand and enhance our own capabilities and expertise in spatially explicit decision support tools for application at landscape scales. We’re quite gratified to have the opportunity to work with the LCC and see this as a huge opportunity to build a long-term partnership.”

Jack Waide, U.S. Geological Survey



Farmland. Photo by Carl Wycoff/Creative Commons.

LAYERS OF BIG MUDDY

Hydrogeomorphic Restoration of the Lower Missouri River



Birds of the Missouri River floodplain at DeSoto National Wildlife Refuge along the Iowa/Nebraska border. Photo by U.S. Fish and Wildlife Service.

The lower Missouri River, the largest free-flowing river reach in the United States, encompasses nearly 1.5 million acres of bottomland habitat for fish, wildlife and plants, while providing commercial transportation and recreation opportunities for communities across our nation's heartland.

The Missouri River contains countless conservation properties and efforts maintained by local, state and federal agencies, nonprofit groups and private entities. Over time, societal interests have led to dramatic changes along the lower Missouri River, creating a system highly influenced by upstream reservoirs

and containing highly altered physical and ecological attributes.

These alterations pose significant challenges for strategic and sustainable maintenance, restoration and protection of the river's wildlife and their habitats.

With funding support from the Plains and Prairie Potholes LCC and Eastern Tallgrass Prairie and Big Rivers LCC, researchers from across federal, state and non-governmental organizations are working together to help inform land managers and develop common conservation priorities. With this goal in mind, researchers are leading

a hydrogeomorphic evaluation of the lower 670 miles of the river from Little Sioux, Iowa, to St. Louis, Mo. The resulting maps, models and report will serve as tools which will help guide land and water uses within the corridor aimed at maximizing ecological functionality while considering flood control, restoration potential, recreation, navigation and other interests along the river.

The hydrogeomorphic approach analyzes historic and contemporary information about the physical features and ecosystem processes of the river.

The analysis will provide a basis for developing habitat objectives for conservation actions, and help identify options to emulate natural hydrologic and vegetation/animal communities patterns and dynamics.

Once completed, the analysis will provide resources managers with a mitigation tool that may address alterations to the region, benefiting fish, wildlife and people. The analysis also incorporates state-of-the-art scientific knowledge of ecological processes and requirements of key fish and wildlife species in the region while identifying key uncertainties and future monitoring needs.

This multi-year project made extensive progress in 2013. Missouri

River conservation stakeholders and scientists gathered in Kansas City, Mo., and Omaha, Neb., to discuss perspectives and information needs and identify datasets and efforts necessary to the hydrogeomorphic evaluation. Attendees included 70 representatives from multiple local, state and federal agencies and non-governmental organizations.

Project coordinators worked with multiple agencies and local groups to research and inventory both historical and current information for the following data layers: geology/geomorphology, topography, bathymetry, soil, climate, hydrology, vegetation and wildlife. Although the compilation of data continues, project coordinators have already

begun to create and combine some of the geospatial layers which will be used for the hydrogeomorphic evaluation.

The U.S. Army Corp of Engineers, the Natural Resources Conservation Service and the U.S. Fish and Wildlife Service are also working on cooperative agreements to provide additional funding to expand this project upstream. The current target is to expand the project from its current end point at river mile 670 upstream nearly 210 miles to the Fort Randall Dam.



Stretch of Missouri River between Rocheport and Booneville, Mo. Photo by Aimee Castenell/Creative Commons.



STRIP BY STRIP

Evaluating the Benefits of Prairie Vegetation to Pollinators, Water Quality and Bird Diversity in Row-Crop Agriculture

Local farmers and downstream shrimpers in the Gulf of Mexico can both benefit from future design and management of innovative conservation practices that provide multiple benefits for imperiled prairie wildlife while reducing nutrient runoff and increasing availability of beneficial insects that control pests and pollinate crops.

LCC partners with Iowa State University and Neal Smith National Wildlife Refuge are leading a ground-breaking effort to improve current conservation efforts that incorporate prairie vegetation into row-crop agriculture. Partners are expanding and improving upon an innovative project known as STRIPS (Science-Based Trials of

Rowcrops Integrated with Prairie Strips). The STRIPS project has documented significant water quality and biodiversity benefits in Iowa, and now aims to implement prairie strips on 10 to 12 farmers' fields throughout that state, while evaluating the impacts of these systems over additional watersheds and landscapes.

U.S. Department of Agriculture's Conservation Reserve Program provides one mechanism for implementing the innovative prairie strips conservation practice. Several vegetation mixtures are commonly used for contour buffer and filter strips. The department's Farm Service Agency has provided funding to researchers through the LCC partnership to compare traditional

contour buffer and filter strips to more diverse prairie plantings to determine how habitat composition may influence pollinator benefits. Based on modeling, researchers can then assess how prairie strips can be designed to better meet water quality and wildlife habitat goals.

To complement this ongoing work, researchers with Iowa State University and the U.S. Fish and Wildlife Service propose additional soil health, water quality and bird diversity studies while evaluating soil erosion, nutrient concentrations and sediment deposition in fields with prairie strips.



Cropland. Photo by Day's Edge Productions.

SLOW TO RESPOND

Eastern Box Turtles Make their Way to Safety through Innovative Relocation Project



Sarabeth Klueh-Mundy, herpetologist with Indiana Division of Fish and Wildlife, attaches a transmitter to an eastern box turtle. Photo by Indiana Department of Natural Resources.

Species that live a long time and move slowly across a fragmenting landscape may quickly find themselves in isolated, dying populations in response to land use and climate change.

The eastern box turtle is one of the most-well known reptiles in North America, although one of the most complex species to manage. Box turtles come in many different colors and are long-lived individuals, taking up to 10 years to reach reproductive age.

The Eastern Tallgrass Prairie and Big Rivers LCC is supporting a translocation project led by the Indiana Department of Natural Resources to help natural resources managers understand potential reintroduction methods as a tool for at-risk species conservation, especially those species that may be less adaptive to our changing climate..

Eastern box turtles like to move around, especially after a warm spring rain. Unfortunately, many

of them end up on the road and get hit by cars. Many of these turtles are seen on roads and highways, leading to an inaccurate perception that populations are not at risk.

In response to the growing concerns about box turtle declines across the country and how the construction of a new interstate highway would affect local populations, non-game biologists with the Indiana Department of Natural Resources rescued more than 200 eastern box turtles from the



Eastern box turtle with transmitter. Photo by Indiana Department of Natural Resources.

proposed Interstate-69 alignment in Indiana.

Each turtle was weighed, measured and given a unique identification number before being placed in a secure, semi-natural environment.

Given the high mortality rates of turtles near large, busy roads, it was determined unsafe to return these turtles back where they came from after the construction of the interstate is completed. Instead, these turtles will be released on reclaimed mine land within Patoka River National Wildlife Refuge as

part of a unique reintroduction program.

Vehicles aren't the only hazard these creatures have to navigate around. Tests confirmed that *ranavirus* was present in both the captive and free-ranging populations as well as in species of other turtles and tadpoles on the reclaimed mine land. A series of other tests were run on individuals from the captive colony to ensure that they weren't infected with secondary diseases that might put the residents at risk. Approximately one-third of the captive colony has died thus far.

Project coordinators are continuing with the original reintroduction program and conducting radio-telemetry on resident eastern box turtles to learn their movements within the reclaimed mine land, while researching the transmission and survivorship of *ranavirus*.

Our Promising **FUTURE**



LCC Coordinator Glen Salmon at America's Grasslands Conference field outing near Manhattan, Kansas. Photo by U.S. Fish and Wildlife Service.

No single entity, whether state, federal, private, or NGO has the answers to tackling our toughest of conservation challenges. And we all struggle with making conservation relevant to the American public. We can all admit that the problems are too big, the issues too complex, and what's at stake too important to take on independently--and without considering human-nature relationships.

We should think about the health of our fish, wildlife and natural resources in the same way we think about our own personal health. Climate change, habitat loss, energy development, land use policy and stewardship ethics are interconnected challenges debilitating an entire system.

They require the coordinated expertise of biologists, economists, social scientists, managers and

landowners. Just as we consider the environmental, physical and genetic factors contributing to our own health, we must proactively consider all facets impacting the health of our natural world.

The days of competitive programs that divide up money and throw resources at small segments of habitat in random acts of conservation are over. The LCC is expanding resources for agencies and organizations by providing access to external funds, information sharing and collaborative partnerships that will fill our needs for coordinated action and pragmatic landscape-level research. The 21st century model for conservation is not just a new idea, but is being implemented as a new way of doing conservation.

As conservationists, we can look to examples from other complex social and scientific issues to discover

more effective ways of working together.

As the concept of LCCs rapidly evolves, we are finding that the pragmatic science requires not just more project funding but convening the best minds in a range of disciplines from wildlife management, water quality, agricultural conservation and urban planning, combined with the social capacity to carefully identify and fill research gaps at key leverage points. We can't leave any stone unturned in finding these solutions before it's too late.

Glen Salmon
LCC Coordinator

