



Upper Midwest and Great Lakes Landscape Conservation Cooperative Steering Committee Announces Eight Fiscal Year 2011 Projects

On June 2, 2011, the UMGL LCC Steering Committee approved the following projects. More information on the UMGL LCC and these projects is available at <http://greatlakeslcc.org>

Project #	Project Title	Project Coordinator	Affiliation	FY 11 Funding
* A full list of partners is included in the project summary				
11-01	<i>A Regional Decision Support Tool for Identifying Vulnerabilities of Riverine Habitat and Fishes to Climate Change</i>	Jana Stewart	USGS	\$200,000
11-02	<i>Manajiwini: Respecting Tribes, First Nations and Cultural Resources in Cooperative Landscape and Climate Change Decision Making</i>	Nicholas J. Reo	University of Michigan	\$128,496
11-03	<i>Predicting Climate Change Effects on Riverine Aquatic Insects Using Museum Data and Niche Modeling</i>	R. Edward DeWalt	University of Illinois	\$145,505
11-04	<i>Full Life Cycle Vulnerability Assessments for the Birds of the Upper Midwest Great Lakes Region</i>	Peter P. Marra	Smithsonian Conservation Biology Institute	\$116,088
11-05	<i>Distribution and Abundance of Breeding Birds in the Upper Midwest and Great Lakes Region as Influenced by Climate and Land Cover Change</i>	Gary J. Roloff	Michigan State University	\$86,341
11-06	<i>On a Wing and a (GIS) Layer: Prioritizing Migratory Bird Stopover Habitat along Great Lakes Shoreline</i>	Dave Ewert	The Nature Conservancy	\$134,771
11-07	<i>Reestablishing ecological connectivity between the Great Lakes and their tributaries: prioritization in a complex system</i>	Peter McIntyre	University of Wisconsin	\$112,965
11-08	<i>Scenarios for forest reserve expansion and adaptive management under alternative climate change scenarios in the northern Great Lakes</i>	Robert Scheller	Portland State University	\$50,992
Total FY 11 Funding				\$975,158



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The Upper Midwest and Great Lakes Landscape Conservation Cooperative (UMGL LCC) geographic area transcends a variety of boundaries and borders. The LCC includes portions of Minnesota, Iowa, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, New York and Vermont, as well as areas of Manitoba, Ontario and Quebec. The geography includes deep water habitats, beaches, coastal wetlands, more than 35,000 islands, major river systems, boreal forests, and prairie-hardwood transition zones. These areas support extensive populations of aquatic and terrestrial species, as well as numerous cultural resources.

Building on a long-standing conservation legacy across the Midwest, the LCC provides a venue for a community of interests to explore how and where to sustain landscapes for natural and cultural resources. In doing so, key products and services are developed for broad use. This spring the UMGL LCC had approximately \$1 million available for cooperative projects. Proposals were ranked based upon their ability to support conservation delivery across the UMGL LCC geography by reducing scientific uncertainty related to factors affecting fish, wildlife, and cultural resources. Finally, the projects needed to address at least one of the following priority themes:

- 1) Describe/model trophic structures of Great Lakes fisheries, assess potential climate impacts, and propose adaptation responses.
- 2) Describe/model potential impacts on stream aquatic communities under various scenarios, identify categories of streams whose fauna is most vulnerable, and recommend adaptation strategies.
- 3) Explore potential impacts of climate or other landscape changes to populations of Upper Mississippi and Great Lakes Joint Venture focal bird species.
- 4) Identify landscape change impacts upon cultural or natural resources on tribal lands, and provide avoidance, adaptation, or mitigation strategies.
- 5) Investigate strategies for reestablishing ecological connectivity in fragmented landscapes encompassing land cover types characteristic of the UMGL LCC geography.
- 6) Explore the Social Dimensions of natural resource management decision making.

~ Project Descriptions ~

On June 2, 2011, the UMGL LCC Steering Committee approved the following projects:

11-01 Project Title: A Regional Decision Support Tool for Identifying Vulnerabilities of Riverine Habitat and Fishes to Climate Change

Project Coordinator: Jana Stewart

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Partners:

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Scott Niemela, Minnesota Pollution Control Agency, St Paul, MN

Matthew Mitro, Wisconsin Department of Natural Resources, Madison, WI

Gary Latzke, US Geological Survey WI Water Science Center, Middleton, WI

Nate Booth, US Geological Survey WI Water Science Center, Middleton, WI

Jeff Schaeffer, US Geological Survey, Great Lakes Science Center, Ann Arbor, MI

FY 11 Approved Funding: **\$200,000**

This project will be executed by a multi-state consortium. By collaborating with and integrating results from five existing projects, the team will: 1) predict potential changes in thermal and flow regimes and keystone fish species/groups under modeled downscaled climate change scenarios to identify vulnerabilities of systems of the Upper Midwest and Great Lakes Landscape Conservation Cooperative (UMGL LCC), 2) organize two workshops of stakeholders to demonstrate a decision support tools and to develop management strategies for key species/habitats with the potential to adapt to altered climate, and 3) develop a web-based decision support system to integrate information generated in objectives 1 and 2 and provide river segment-scale data that characterize the river network/catchment, connectivity, vulnerability to climate change, and potential management scenarios and adaptation strategies for use by stakeholders.

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11-02 Project Title: Manajiwini: Respecting Tribes, First Nations and Cultural Resources in Cooperative Landscape and Climate Change Decision Making

Project Coordinator: Dr. Nicholas J. Reo

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Partners:

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Eric Clark, Director; Sault Ste Marie Tribe of Chippewa Indians Inland Fish and Wildlife Dept; Sault Ste. Marie, MI

Nadine Roach, Forestry Coordinator; Lands and Resources Division, Anishinabek Nation; North Bay, Ontario

Esteban Chiriboga, GIS Mapping Specialist; Great Lakes Indian Fish and Wildlife Commission; Madison, Wisconsin

TNC - Great Lakes Project

FY 11 Approved Funding: **\$128,496**

The goal of the Manajiwini Project is to improve Tribal and First Nation engagement in cooperative natural resource conservation efforts. The project will achieve this goal by fostering networking among Tribes, First Nations and other relevant partners in the Upper Midwest – Great Lakes region. It will also involve Tribal and First Nation representatives in the development of a set of principles and strategies for their authentic, robust inclusion in regional resource conservation cooperative frameworks. Finally, the project will conduct an environmental scan of current climate and landscape change planning initiatives as well as mitigation and resilience-building projects being implemented by Tribes and First Nations in the region. The results will lead to broader inclusion of tribal values, traditional knowledge and cultural resource protection in regional conservation initiatives.

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11-03 Project Title: Predicting Climate Change Effects on Riverine Aquatic Insects Using Museum Data and Niche Modeling

Project Coordinator: Dr. R. Edward DeWalt

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Dr. Pat Randolph, University California Davis, Davis, CA.

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FY 11 Approved Funding: **\$145,505**

Four major data sources, aquatic insect museum data, environmental data from the Great Lakes Aquatic Gap Program, the National Hydrography Dataset, and USEPA-STAR Climate Change Database, will be used to model the occurrence of some 400 species of aquatic insects and assess how climate change will affect their distributions and connectivity between populations. The study area will include the USA portion of the UMGLCC excluding NY, PA and VT. Phase I will model stonefly (Plecoptera) data in the first year. Phase II will model mayfly (Ephemeroptera) and caddisfly (Trichoptera) in the second year.

The compiled data will result in models of predicted natural and climate modified occurrence for up to 400 species occurring in the region. A map, color coded by probability of occurrence for each modeled species, will yield an “expectation” under different emission scenarios. Arc-based species richness maps will be produced by summing the probabilities of individual modeled species that illustrate how EPT diversity hotspots shift under different emission scenarios by the end of this century.

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11-04 Project Title: Full Life Cycle Vulnerability Assessments for the Birds of the Upper Midwest Great Lakes Region

Project Coordinator: Peter P. Marra, Conservation Ecologist

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Partners:

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Drs. Scott Sillett & Brandt Ryder Smithsonian Conservation Biology Inst

Dr. Kim Hall, The Nature Conservancy, Great Lakes Project

Dr. Wayne Thogmartin, Upper Midwest Environmental Sciences Center, Wisconsin

Dr. Bruce Peterjohn, USGS Bird Banding Lab, Patuxent Wildlife Res. Center, Maryland

Dr. John Sauer, USGS Patuxent Wildlife Res. Center, Maryland

Dr. Tom Will, USFWS, Region 3 Minnesota

FY 11 Approved Funding: **\$116,088**

Full life-cycle vulnerability assessments will be carried out of the effects of climate change on nongame migratory birds that are of conservation concern that breed in the UMGL region. Full life-cycle analyses are critical, as current efforts likely underestimate the vulnerability of migratory land birds due to a focus on assessing only one component of the annual cycle. Our approach will provide a framework for integrating exposure to climate changes, sensitivity to these changes, and the potential for adaptation in both winter and summer seasons, and accounts for “carry-over” effects from one season to another. The results of this work will inform regional management by highlighting both local and distant drivers of vulnerability, and provide a model for accounting for the complexities of migration within multi-taxa assessments that can also be applied to other species, such as waterfowl and fish. Bird Banding data and life history information will provide the primary source data for the project.

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11-05 Project Title: Distribution and Abundance of Breeding Birds in the Upper Midwest and Great Lakes Region as Influenced by Climate and Land Cover Change

Project Coordinator: Dr. Gary J. Roloff

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FY 11 Approved Funding: **\$86, 341**

The proposed study will provide a retrospective analysis of the relationships among bird abundance and distribution and changes in land cover and climate in the Upper Midwest and Great Lakes region. The resultant models can subsequently be used to provide spatially explicit forecasts of future avian responses and thereby become an important planning tool. This project provides a cost effective means of incorporating climate change into bird conservation decisions.

The proposed project will use data from the North American Breeding Bird Survey (BBS) to estimate species distribution and abundance from survey routes using a hierarchical modeling framework that accounts for imperfect detection during surveys (Kery et al. 2005, Royle and Dorazio 2008, Dorazio et al. 2010). The datasets for landscape covariates will be retrieved from multiple sources. Climate information will likely be compiled from the down-scaled climate data currently being compiled by the University of Wisconsin-Madison and Canadian Climate Center model (Boer et al. 2000). Additionally, land cover layers (e.g., NLCD) that correspond to BBS time periods will be used to quantify land use change over time. Once species-specific relationships between distribution parameters (i.e., occupancy, colonization, extinction) and landscape covariates have been established, climate change projections will allow prediction of future species' distributions.

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11-06 Project Title: On a Wing and a (GIS) Layer: Prioritizing Migratory Bird Stopover Habitat along Great Lakes Shoreline.

Project Coordinator: Dr. Dave Ewert

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FY 11 Approved Funding: **\$134,771**

The overarching goal of this project is to develop a scalable (Great Lakes wide, individual lake basin, to coastal reach within a lake basin) rule-based spatial model for ranking the relative importance of coastal lands (< 15 miles from shoreline) and waters as habitat for migrating birds. Results will be used to guide conservation actions including land acquisition, land and water management and restoration, and development of wind energy facilities. Specifically, the team will: 1) Refine, create and integrate migratory bird stopover habitat models which depict the distribution of potential stopover sites along or near the shorelines of Lakes Michigan, Huron, Erie, and Ontario; and, 2) develop an online portal that will deliver results, models, data and information to conservation decision makers and implementers. This work will maximize application of sound science when making recommendations and decisions regarding land acquisition, management, restoration, and wind energy development.

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11-07 Project Title: Reestablishing ecological connectivity between the Great Lakes and their tributaries: prioritization in a complex system

Project Coordinator: Dr. Peter McIntyre

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Dr. Ed Rutherford, NOAA-Great Lakes Environmental Research Laboratory, Ann Arbor, MI

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FY 11 Approved Funding: **\$112,965**

Ecological connectivity between the Great Lakes and their tributaries is widely impaired, and many agencies and organizations are currently investing in restoring these connections to enhance target fish and wildlife populations. To assist in targeting these investments spatial data on the location and attributes of barriers (dams and road-stream crossings) and fish breeding habitat (lake sturgeon and coaster brook trout) throughout the Great Lakes basin will be synthesized and used to analyze the optimum strategy for enhancing connectivity and restoring fish migrations. The project will provide specific guidance for restoration at scales from individual watersheds to the entire basin, refine methodologies for spatial analysis of barriers, and provide a systematic framework for comparing costs (direct economic costs, species invasions) and benefits (connectivity, focal fish species) of barrier removal.

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11-08 Project Title: Scenarios for forest reserve expansion and adaptive management under alternative climate change scenarios in the northern Great Lakes.

Project Coordinator and PI: DR. Robert Scheller

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Partners:

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Mark White, TNC, Duluth, MN

FY 11 Approved Funding: **\$50,992**

This project will assess how an expansion of forest reserves and climate-adaptive management may improve ecological connectivity and resilience under different climate scenarios. We will assess resilience as the capacity for these systems to maintain extant forest communities and aboveground live biomass. The study will use a spatially explicit forest ecosystem model, LANDIS-II, and will cover areas in northern MN and northern lower MI that represent northern Great Lakes forest types. Restoring and maintaining ecological connectivity is one of the primary climate change adaptation strategies available to land managers, and this study will be integrated into an ongoing regional Climate Change Response Framework to link the results to land management throughout the Northwoods.

The project will simulate scenarios using a full factorial design that includes our two landscapes, two carbon emission projections (A1FI and B2), two reserve densities (current extent and 25% area increase; reserves are defined as forested areas that do not allow commercial timber harvesting but do allow for limited silvicultural management to pursue ecological goals), and two silvicultural options (business as usual, and an “ecological adaptation” regime based on expert inputs). Additional reserve areas will be added adjacent to existing reserve areas. The new reserve areas will follow ownership patterns that are possible on state, federal and tribal lands. Each scenario will be replicated a minimum of three times to capture inherent variability. From these scenarios, the temporal and spatial variation will be analyzed to isolate the effects of fragmentation, reserves, climate projection, and silvicultural practices. Then the project will assess whether current forest reserves can maintain resilience (given differing climate projections) by examining the rate of compositional change over the next 100 years. Similarly, the project will also assess whether an expansion of reserves can enhance forest resilience.

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