Lower Wabash River Landscape Conservation Design (LCD)
Strategic Plan & LCD Framework
(DRAFT May 2017)

Background: Floodplain Wildlife and Ecosystem Services in the Heartland

The Wabash River drains two-thirds of Indiana's 92 counties and 25 Illinois counties, including a 411-mile section that constitutes the longest stretch of free-flowing river east of the Mississippi. A river with both regional and national significance, the portion of the river that runs south of Terre Haute, IN and forms the Indiana-Illinois southern border is particularly important both ecologically and culturally. Notably, the river and its associated habitats play host to an amazing biodiversity of plant and animal species—there are approximately 700 rare occurrences of fish and wildlife in the habitats surrounding and within the Wabash River—but that unique biodiversity is at risk. In particular, excess nutrient loading is a major threat to the Wabash and its resources. This excess loading is illustrated by the fact that the river accounts for a disproportionate share of the nutrients flowing into the Gulf of Mexico, being responsible for only 1% of the flow but 11% of the nitrogen load entering the Gulf [citation?]. Flowing through some of the Midwest's most productive agricultural land, much of this nutrient loading results from the agricultural production that constitutes the majority land usage throughout the watershed.

Due to the intersection of climate zones and topography, the ecosystems in this region are unique combinations of northern and southern habitats. The Wabash contains the longest stretch (411 miles) of free-flowing river east of the Mississippi, and provides habitat for over 400 aquatic species including the Clubshell, Fanshell, Rabbitsfoot, Snuffbox, and Rayed Bean mussels—all federally listed as threatened or endangered species. In addition, the river and its floodplains form critical habitat and an important migratory pathway for waterfowl and other wetland-dependent wildlife. Up to 300,000 ducks and geese have been reported to winter on the Lower Wabash River, and the Wabash River watershed has the highest density of wintering federally endangered Whooping Cranes than any other area in the Midwest [citation?].

The quantity and quality of habitat for wildlife in this area is highly dependent on precipitation patterns, making habitat management in this region particularly complex. Currently, little intentional management for waterfowl and shorebirds occurs within the floodplain of the Wabash and its tributaries. Flood events provide habitat for many wildlife species, but examples such as the Cane Ridge and Goose Pond Wildlife Management Areas (WMA) demonstrate that properly designed and managed habitat restoration can have tremendous benefits to target species. With the majority of the watershed invested in row-crop agricultural production (67%), and with the majority of existing habitat being ill-suited for the needs of migratory waterfowl and/or shorebirds, additional wetland habitat acreage is necessary in order to address wildlife resource concerns.

In addition to maximizing biodiversity and wildlife resources in the region, restoring and protecting floodplains and associated uplands along the Wabash is likely the single best strategy for improving the water quality in the Wabash River to ensure it continues to be a valuable resource for future generations. In fact, a recent study conducted by the University of Notre Dame, and partially funded by The Nature Conservancy, showed that the 30,000 acres of floodplains currently protected are retaining 19 million pounds of nitrogen, 469,000 pounds of phosphorus and 360 million pounds of sediment each year [citation?]. In addition, while reducing nutrient export to the Gulf of Mexico is a primary concern, the presence of excess levels of these same nutrients and sediments can also cause problems for local aquatic species. Excess nutrients can cause fish kills and excess sediments contribute to the degradation of important habitats for many riverine species; this degradation may include loss of depth, greater turbidity, and loss of substrate firmness.

Currently, 7% of the proposed project area is restored floodplain. Based on literature and current loading, restoring 54,700 additional acres (10% of the proposed project area) could meet the recommended 20% export reduction goal [which nutrients?] suggested by Goolsby et al. 1999 for the Mississippi Basin. Additionally, the Hypoxia Task Force has set a longer term goal of 45% reduction in nitrogen loadings for the Mississippi Basin to address hypoxia in the Gulf of Mexico. According to calculations by The Nature Conservancy, six Midwest watersheds contribute over a quarter of the Gulf nutrient load with the Wabash River providing the highest export of nutrients.

The potential for conservation value per dollar spent may be remarkable because of the above combination of benefits. The partners involved have already achieved some habitat conservation in the Lower Wabash floodplains and associated uplands. Additional resources could support enhancement and restoration of a continuum of connected habitats for upland prairie and forests, riparian, wetland and floodplain species while reducing nutrient and sediment outflows to the Ohio and ultimately the Gulf, while reducing financial impacts from the increasingly frequent severe floods along the Wabash and Ohio Rivers.

Landscape Conservation Design

By bringing together local and regional partners for the purpose of creating a landscape conservation design, we can protect and improve habitats, working lands, and ecosystem services and functions, providing benefits for wildlife and water quality locally and also downstream through the Mississippi River Basin and ultimately the Gulf of Mexico. By integrating better management practices, spatial analysis and scenario planning, and increased collaboration among partners, this conservation partnership will serve to motivate a more efficient and effective delivery of conservation in the region, maximizing conservation value in a multifunctional working landscape.

Landscape Conservation Design (LCD) is an element of Strategic Habitat Conservation (SHC), the U.S. Fish & Wildlife Service's adaptive management framework, corresponding to the Biological Planning and Conservation Design elements of SHC. The LCD process facilitates collaborative, landscape-scale conservation. It integrates societal values and multi-sector interests with the best-available interdisciplinary science to assess landscape conditions, vulnerabilities, risks and opportunities to achieve desired changes. The LCD process results in the development of spatially-explicit information and produces coordinated strategies to achieve desired conditions. Because LCDs are developed through partnership processes, LCD implementation achieves coordinated results that produce greater conservation benefits than could be achieved by each partner working independently.

Stakeholders (see list of contacts below)
This LCD is designed to connect partners and stakeholders concerned with the future of the lower Wabash, associated habitats and land uses, and the species that depend on them. Its purpose is to connect organizations, agencies, and private landowners for resource and information sharing as well as for collaborative planning and implementation of multiple-benefit conservation that will have the greatest impacts in the watershed. All partner participation is voluntary and self-organized; the group is geared to work as a team to improve the health of the lower Wabash River watershed.

The current partners include program leads in the following organizations: USDA, NRCS, Indiana DNR, Illinois DNR, US Fish and Wildlife, US FWS Private Lands, Patoka Refuge, The Nature Conservancy, Ducks Unlimited and private landowners. Staff support has been provided by the US FWS through the Eastern Tallgrass Prairie & Big Rivers Landscape Conservation Cooperative (ETPBR LCC).

The group has intentionally started small to make progress on a draft framework as a collaboration of programs with facilitation from ETPBR LCC staff and graduate student interns from Indiana University SPEA. They have identified other agencies and organizations to invite as well as considering "test driving" the strategy through input from additional landowners in the area.

The stakeholders are exploring opportunities and developing a prospectus to apply for funding for a full time watershed planning coordinator to refine this strategy and associated conservation designs, followed by initial implementation through the collaborating programs, possibly with additional assistance from a technical services provider.

Meetings
The stakeholder group has had active engagement at eight in-person meetings over two years from April 21, 2015, to April 20, 2017. This organizational group generally meets about three times a year near the border of Indiana and Illinois to

encourage participation from both states. Work teams have met online in between to discuss the framework. Two work teams from within the stakeholder group are working on Wildlife and Water Quality Performance Metrics.

Products

Data layers and spatial analyses from the multi-LCC *Gulf Hypoxia Initiative – Precision Conservation Blueprint v1.5* developed by The Conservation Fund provide a very large landscape scale planning context, which has been modified to fit local objectives, along with additional analyses using the 30m green infrastructure habitat targeting layers in pilot HUC4 watersheds identified by the *Blueprint*.

IU SPEA Capstone classes by four student groups led by faculty Dr. Vicky Meretsky and ETPBR LCC staff have developed additional planning and policy recommendations to support deliberations by the stakeholders.

- *Sycamore Land Trust wetland corridor for southern Indiana.* Delaney Bolger, Richard Marcantonio, Dana Parkinson, and Ben Weise. IU SPEA, May 2016.

- *Evaluation of Conservation Practices, with an Emphasis on Habitat Quality and Climate Change in the Lower Wabash Watershed*. Charlotte Bradley, Crystal Haulter, and Yu Song. IU SPEA, December 2016.

- *GIS Analysis of Climate Change Impacts in the Lower Wabash River Basin*. Brielle Cummings, Michael Santel, Michael Caldie. IU SPEA, December 2016.

- *Strategies to Improve Conservation Practices in the Lower Wabash*. Neal Capapas, Gang-Ryun Kim, Kyung Tae Park, Matthew Singer, Grant Weil. IU SPEA, December 2016.

On May 10, 2017, IU President Michael A. McRobbie announced a Grand Challenge award for "*Prepared for Environmental Change: Resilient Ecosystems, Livable Communities, and Healthy Hoosiers*" to develop research for pilot applications for strategic management of wildlife, water quality and agricultural productivity in the Lower Wabash River -- one of three pilot communities in Indiana. The budget is $55 million over five years including hiring of 16 new faculty along with the work of dozens of students each year on Indiana University's Bloomington and Indianapolis campuses. The stakeholders will meet with IU faculty to guide directions for applied research and faculty hires to develop science and management tools for the Lower Wabash region as a model for agricultural conservation across the Midwest.

Guiding Principles

To accomplish the vision of Lower Wabash Landscape Conservation Design there are three strategic approaches the Lower Wabash LCD Partnership has determined that the partnership will:

- Regularly convene partners and stakeholders and maintain regular communication between partners
- Create, refine, and update goals and objectives for the region
- Identify geographies and issues where partners and stakeholders can work cooperatively to implement goals, objectives, and actions
- Work across and include partners from all sectors

Problem Statement (draft):
The Wabash River drains two-thirds of Indiana's 92 counties (over 33,000 square miles). The portion of the river that runs south of Terre Haute, IN, has very important ecological significance. The entire river accounts for 1% of the water and 11% of the nitrogen content of the Gulf of Mexico. There are approximately 700 rare occurrences of wildlife in the habitats surrounding the Wabash River, which is an important migratory pathway for waterfowl. The Lower Wabash is also a productive area for floodplain farming, which may increase the amount of nutrients in the river. With it being an important area for biodiversity and human use, the change in climate, and weather from year to year, conservation efforts can help to preserve not only the habitats, but the ecosystem as a whole including working lands, and health of other rivers and floodplains in the waterway system.

Geography (see maps below)
This landscape conservation design will be for the lower portion of the Wabash River, south of Terre Haute, IN until it flows into the Ohio River. This includes major floodplains and associated headwaters in the entire watershed of the lower Wabash and the contributing tributaries in both Illinois and Indiana, including the Eel River and lower West and East Forks of White River in Indiana as well as the Little Wabash, Embarras, and Fox rivers in Illinois. The targeted habitats in this area include modified headwaters, prairie grasslands, forested riparian zones, and bottomland hardwood forests.

Targeted Species
The following indicator or umbrella species may be monitored to represent the health of these habitats found within the Lower Wabash ecosystem.

- Floodplains
  - *Agricultural Fields in floodplains:* mallard, pintail, shorebirds (greater yellowlegs, pectoral sandpiper), interior least tern, whooping crane
  - *Bottomland hardwood forests:* Indiana bat, northern long ear bat, wood duck, black ducks, prothonotary warbler, Louisiana water thrush
  - *Emergent marshes:* mallard, green wing teal, ring necked duck, pintail, great egret, sora rail
  - *Giant canebrakes:* swamp rabbit
  - *Oxbows:* wood duck, paddlefish

    - *Rivers:* paddlefish, shovelnose sturgeon, blue sucker, alligator snapping turtle
        - Creole pearly eye
        - Fat pocketbook mussel
        - Kidneyshell mussel – not in mainstem Wabash River or tribs, population exists in Richland Creek, which is a tributary of the West Fork White River in Greene County
        - Rainbow mussel – found live in Richland Creek
        - Salamander mussel– not in mainstem Wabash River or tribs, population occurs in the East Fork White River upstream through Martin County
        - Sheepnose mussel – not found live in mainstem Wabash River or tribs, a single live individual collected from the mainstem Wabash River in 1988 (mussel locations from pers. com. Brant Fisher, IN DNR)
    - *Sandbars and islands with swales:* spadefoot toad, interior least tern
    - *Swamps and thickets, spring fed seeps:* copperbelly water snake
- Headwaters
    - *Agriculture Fields in headwaters:* Bobwhite quail, pollinators, monarch butterfly
    - *Early successional forest:* prairie warbler
    - *Grasslands:* bobolink, Henslow's sparrow, grasshopper sparrow, short-eared owl, northern harrier, dickcissel, eastern meadowlark
    - *Upland forest:* copperbelly water snake, American woodcock, Indiana bat
    - *Vernal pools:* sirens, silver salamander, crawfish frog, short-eared owl, American woodcock

Stakeholder Mission
To conserve and enhance soil health, water quality, and wildlife habitat in the lower Wabash watershed for the benefit of our communities.

Stakeholder Vision *(draft variations)*

- The lower Wabash river area will have clean rivers, healthy and nutrient rich soils, large wildlife diversity, public stewardship of agricultural and refuge land. It will have adapted to increase the stability of the area through smart practices and management efforts.
- The Lower Wabash Area will be a connected refuge, agricultural and river area that has clean water, healthy soils, large diversity of wildlife, stable ecosystems that attract nature lovers for recreation and are beneficial for generations.
- The lower Wabash River will be a net benefit to water quality, providing greater nutrient and sediment retention than export, while continuing to

provide highly productive farmland, wildlife habitat, and recreational opportunities.

Strategic Framework

GOAL 1 – Improve water quality both locally and downstream

Objective 1.1 – Improve land stewardship and soil health. Building land stewardship practices and soil health on the landscape forms a vital component of improving water quality. In particular, nutrient management is critically important. The Wabash River contributes a disproportionate amount of nutrients downstream to the Gulf of Mexico, and thus there is a unique opportunity in this region to impact water quality not only at home but also downstream.

Action 1.1.1. Foster vision in the community by educating, advocating, and promoting the benefits of soil health for floodplain wildlife conservation and water quality. Develop an understanding in the community of what soil health is, how it works, and why soil health and land stewardship in this particular region is very important for nutrient loading and wildlife.

Strategies:

1) Identify "farmer mentors" in the region; leverage these leaders to conduct outreach to other landowners and producers
2) Work with organizations in area, including FFA, IYFA, schools, colleges, HASTI, ISTA, etc. to promote soil health and land stewardship in a broader conservation context;
3) Work with nontraditional partners (e.g., agriculture groups, agribusiness) to broaden outreach potential and coordinate messages
4) Develop stories in ag media on broader conservation context of soil health and land stewardship and its importance not only for water quality but also wildlife, and when possible, farm profitability and productivity.
5) Develop social and personal networking presence for conservation in the region
6) Unify advertising and outreach for consistent messaging to avoid duplication of effort or mixed messages reaching the public.

Action 1.1.2. Leverage human dimensions research and theory to better engage landowners and producers in conservation efforts.

Strategies:

1) Review and consolidate existing human dimensions research, focusing on management implications (Linda Prokopy)
2) Conduct or commission a social survey to determine specific regional drivers for the adoption of conservation practices

Action 1.1.3. Support and accelerate the implementation of agronomic practices that build soil health and promote good land stewardship.

Strategies:

1) Build local capacity; increase staff and administrative capabilities in local NRCS/SWCD offices to meet current and future demand for conservation program delivery.
2) Use the Conservation Blueprint v1.02 for the strategic targeting of regional planning and field-scale implementation
3) Engage and link with existing groups (e.g., Watershed Management Authorities, other watershed groups) to avoid duplication of effort and to leverage maximum resources
4) Pursue funding and grant opportunities to bring technical and financial support capacity to the region (e.g., RCPP)
5) Partner with mentor farmers to develop and promote local demonstration sites

Action 1.1.4. Identify priority areas to focus outreach and implementation efforts

1) Identify areas that offer the most cost effective or greatest environmental impact to initially target for demonstration areas
2) Strategically target areas for soil health and conservation practices (headwaters to mainstem, or floodplain to headwaters, etc.)

Objective 1.2 – Restore natural ecosystem services and processes. Restoring natural ecosystem services, both in the uplands as well as in the floodplains and river bottoms, can have a great impact on water quality both locally and downstream. This is especially true in agricultural production systems, where natural processes and services have been removed for row-crop cultivation. Restoring some of these natural processes and services is a clear next step to improved water quality, whether through working lands practices or larger-scale restoration projects (e.g., floodplain restoration).

Action 1.2.1. Restore native habitat and ecosystems that contribute important ecosystem functions and services

Strategies:

1) Use the Conservation Blueprint v1.02 to target efforts for habitat restoration to maximize nutrient reduction potential
2) Use Conservation Blueprint v1.02 to identify marginal lands for restoration
3) Conduct analysis to determine ecosystem services and benefits of restorations
4) Conduct climate assessment to determine resilient and at-risk species and habitats in the region; select reforestation and restoration species based on soils, flood pulses, changing flood regimes, elevations, and climate change resilience.

5) Provide information and education on ecosystem services and the benefits of habitat restorations

Action 1.2.2. Restore stream and channel characteristics to restore ecosystem services, including but not limited to restoring sinuosity and low-head dam removal.

Strategies:

1) Pursue removal of drainage designations
2) Provide information on ecosystem services and benefits of channel restoration and dam removal, including benefits to safety, recreation, etc., that may be meaningful to the community

Action 1.2.3. Work with farmers and producer groups to promote and increase ecosystem service delivery from working lands

Strategies:

1) Formulate ongoing approach with Farm Bureau and other producer groups to create alternative solutions for producers
2) Work with producer groups to promote and advertise the provision of ecosystem services
3) Develop ecosystem service incentive and certification program
4) Work with pilot farms or mentor farmers to determine economic cost/benefit/profit of conservation actions on individual parcels. Broader implementation may be possible if it can be demonstrated that farm profitability is not damaged (or is increased).

GOAL 2 – Improve and increase wildlife habitats on the landscape to benefit a diversity of aquatic and terrestrial species.

Objective 2.1 – Increase priority habitat on the landscape. The partnership identified several priority habitats. Increasing the amount of these priority habitats present on the landscape would have a beneficial impact on a wide array of species, as habitat is often the primary driver and limiter of species abundance. In addition, strategic planning for connectivity to form contiguous habitat blocks or corridors would have an even greater benefit for wildlife in the region.

Action 2.1.1. Connect and coordinate existing restoration efforts to avoid duplication of effort and maximize Return on Investment

Strategies:

1) Review existing habitat to determine habitat quality and function. Use high quality habitats as models for future habitat projects. Identify ways to increase quality and function of low quality habitats.
2) Step down habitat and species goals from existing plans, including: JV, SWAPs, IN DNR Technical Advisory Committees, INHS, etc.
3) Use Precision Conservation Blueprint v1.02 to identify priority areas for acquisition and restoration

4) Pursue large-scale restoration and acquisition opportunities (including levee and dam removal/construction) that provide greatest ROI and off-site impacts
5) Commission HGM to further guide future restoration and design efforts
6) Pursue funding opportunities for large-scale restoration based on strategic approach outlined here (e.g., RCPP, NAWCA grants)

Objective 2.2 – Improve quality of existing habitat. In addition to protecting and restoring new habitats on the landscape, existing habitat or existing opportunities must be managed to provide the best quality habitat possible.

*Action 2.2.1***.** Target priority protection to increase connectivity on vital lands.
Strategies:
1) Use Conservation Blueprint v1.02 to identify and map high priority areas for the protection and connectivity of large habitat blocks.
2) Identify existing habitats for long-term protection; determine a mechanism for long-term protection (acquisition, in-holdings, easements, etc).

Action 2.2.2. Identify priority habitats and maximize habitat quality and value through management or other conservation actions.
Strategies:
1) Identify locations (sites, parcels, areas, etc.) with highest habitat quality potential, and habitat types that provide the greatest benefit to focal or target wildlife species.
2) Implement management strategies to maximize habitat value to wildlife and other focal/target species.
3) Focus fee-title acquisition efforts on areas with highest habitat quality potential. Habitats that have less quality potential should be targeted through alternative protection mechanisms, such as conservation easements.

GOAL 3 – Adapt to future changes

Objective 3.1 – Reconnect people to the landscape. Increasing access to the environment and encouraging a connection with the landscape will improve and grow the desire to take care of the land. Ultimately, individuals conserve and work for things they know and love. Connecting people to their natural landscapes through education and outreach is a vital and necessary component of any conservation initiative.

*Action 3.1.1***.** Highlight significance of protecting habitats within landscape corridors.
Strategies:

1) Develop cooperative promotion of conservation activities and integrate existing outreach efforts to highlight existing conservation partnerships and the impacts on local communities (ex. TNC public service announcements, Indiana Wildlife Federation, Patoka NWR trail interpretation with volunteer maintenance, Oakland City parks, Goose Pond Marsh Madness).
2) Identify and leverage existing programs and audiences for education on land stewardship, values of nature, connecting kids to nature, relating nutrient management in the Wabash watershed to the Gulf of Mexico (ex. Indianapolis Zoo dolphin exhibit on Gulf hypoxia).
3) Communicate relationships between species and their ecosystems and ecosystem services (e.g., pollinators).
4) Focus public outreach and engagement on the impacts of climate change
5) Host public/community outreach days so that people can see conservation in action on the landscape
6) Address public policy such as Farm Bill, water law, etc. with legislators and decision makers (ex. DU participation in Congressional Sportsmen's Caucus, FWCC/FWAC).
7) Be aware of potential concerns about avian influenza and migratory birds.

Objective 3.2 – Increase resiliency of working lands. An expanding human population and increasing resource needs will require more of working lands and natural resources over the next several decades than ever before. In the face of future uncertainty (e.g., climate change), we must increase the resiliency and sustainability of working lands to absorb these additional needs.

Action 3.2.1. Promote and accelerate the adoption of agricultural practices that are demonstrated to have a long-term positive impact on the land and soils, including: conservation tillage, drainage water management, cover crops, filter strips, crop rotations, two-stage ditches.

Strategies:

1) Build capacity (e.g., staff, funding) in local organizations to work with landowners to put these practices on the ground.
2) Utilize Precision Conservation Blueprint v1.02 to identify and target conservation towards marginal lands
3) Promote and accelerate education and outreach efforts with landowners and producers to provide information on the impacts of climate change and the need for a resilient landscape.

Objective 3.3 – Integrate adaptive management and scenario planning. To make the most of limited resources and capacity, conservation delivery must be "strategically opportunistic." Integrating scenario planning and adaptive management principles into decision making processes can help to clarify the

myriad of ways in which land and land usage is likely to change over the next several decades.

*Action 3.3.1***.** Target restoration to habitats that provide resilience to climate change.

Strategies:

1) Identify both vulnerable and resilient habitats and species
2) Focus on long hydroperiod (e.g., semi-permanent) wetlands that will prove more resilient to long periods of drought or increased flooding and precipitation leading to inundation; this resilience means that these long hydroperiod wetlands will play an important role on the landscape.
3) Protect water resources in alluvial aquifers to build resiliency of food supplies and farming which are less vulnerable to climate extremes
4) Focus on restoring habitat connectivity to provide "climate corridors" for focal species

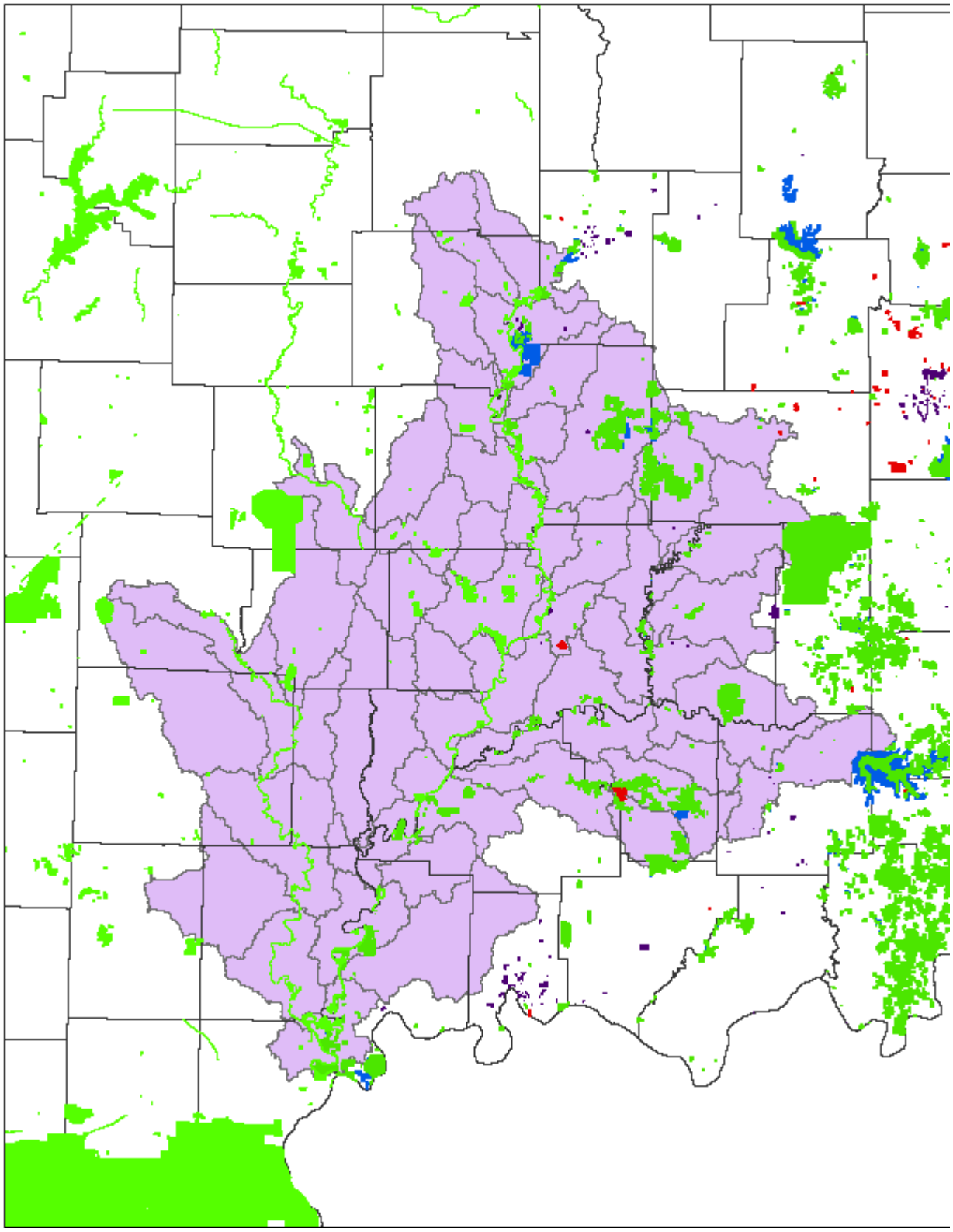
Planning Team Leadership and Contact list:

- *Ducks Unlimited* - David Brakhage, Mike Sertle
- *IASWCD* - Jennifer Boyle Warner
- *IL DNR* - Randy Smith, Terry Esker
- *Illinois Natural History Survey* - Aaron Yetter, Heath Hagy
- *IL NRCS* - Paula Hingson, Kevin Webb, Ryan Pankau, Shannon Allen, Gary Zwilling
- *IDEM* - Marylou Renshaw, Joshua Brosmer
- *IN DNR* - Mark Reiter, Amanda Wuestefeld, Ben Miller, Erin Basiger, Anthony Sipes
- *IN NRCS* - Jane Hardisty, Jill Reinhart, Shannon Zezula, Jeff Coats, Tom Held, Dan Hovland
- *Indiana University* – Vicky Meretsky, Rob Fischman
- *Knox County (IN) Soil & Water Conservation District* – Troy Hinkle
- *Posey County (IN) Soil & Water Conservation District* – Jeri Ziliak, Carrie Parmenter
- *McCormick Farms Inc* - Ray McCormick
- *National Wild Turkey Federation* - Shawn McWilliams, Ryan Boyer
- *National Fish & Wildlife Foundation* - Eric Forward
- *Ohio River Fish Habitat Partnership* - Donovan Henry
- *Pheasants Forever* - Aaron Kuehl
- *Sycamore Land Trust* - Christian Freitag, John Lawrence
- *The Nature Conservancy* - Mary McConnell, Matt Williams, Brad Smith
- *US FWS Patoka River National Wildlife Refuge* - Bill McCoy, Heath Hamilton
- *US FWS Partners for Fish & Wildlife* - Jeff Keifer, Julia Kemnitz (IN), Chris Greene (IL)

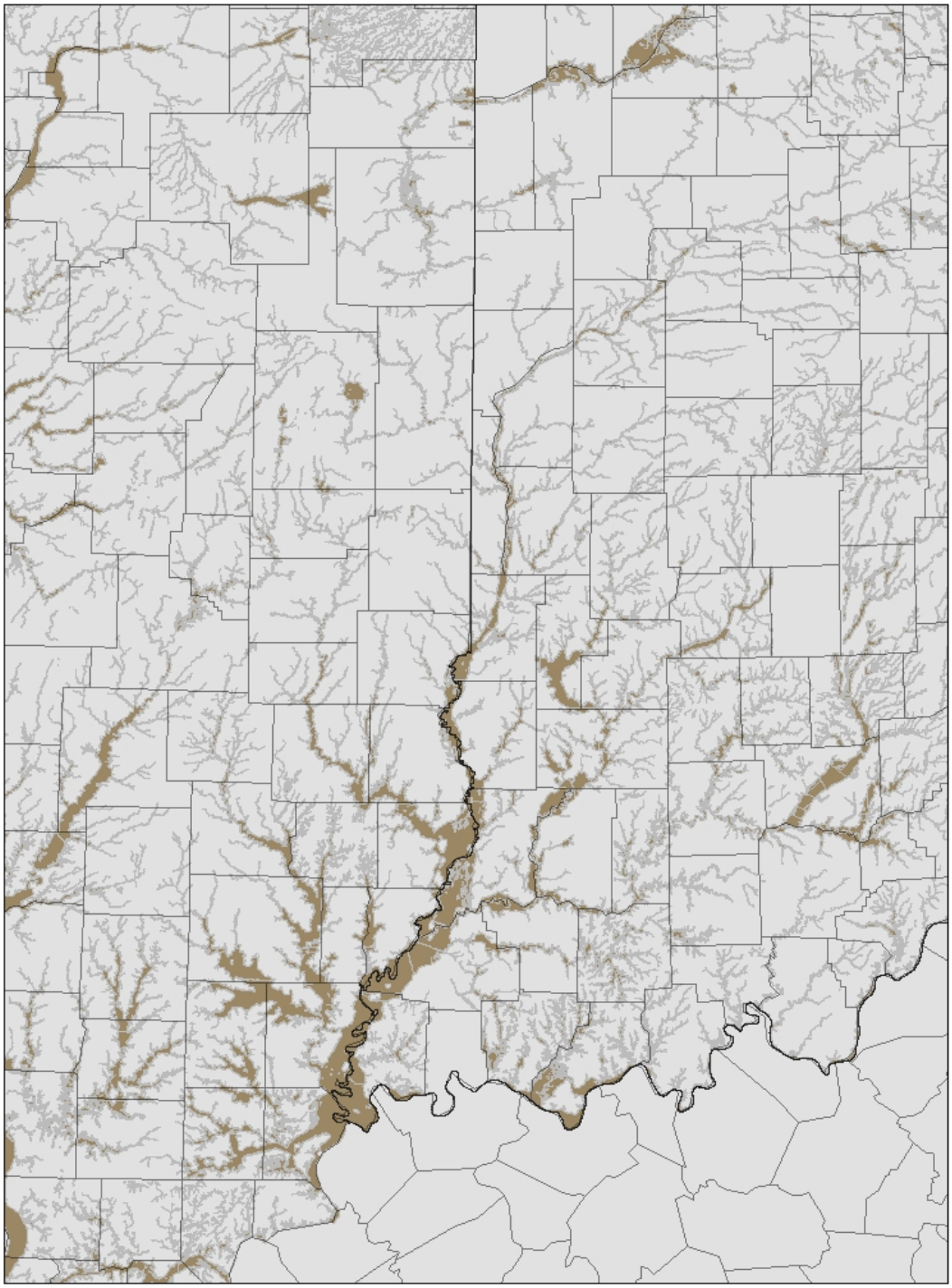
Stakeholder Facilitation: Tallgrass Prairie LCC - Kelley Myers, Gwen White

Map of river segments of interest

Lower Wabash watersheds and county map of geographic area of interest



Floodplain map for geography of interest



Wetland Corridor Map: