Proceedings Report on Great Lakes Coastal and Nearshore Habitat Assessment Project—Indiana

November 14th, 2019
Patricia J. Smith Hall
Red Mill County Park
9:00 am – 4:00 pm

LimnoTech

Water | Scientists
Environment | Engineers

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Proceedings Report on Great Lakes Coastal and Nearshore Habitat Assessment Project—Indiana

Patricia J Smith Hall

Red Mill County Park

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November 14th, 2019

FINAL

Prepared for:

Coastal States Organization

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Workshop developed in partnership with:

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Introduction

Many Great Lakes shoreline reaches have deteriorated in function and quality due in part to land use change, shoreline alterations, coastal infrastructure, and other influences. Effective restoration actions in these dynamic, complex systems require integrated approaches to enhance coastal biodiversity and promote ecological resilience. To help facilitate the development of these approaches, National Oceanic and Atmospheric Administration (NOAA), the Coastal States Organization (CSO), and Great Lakes Coastal Zone Management Programs conducted workshops in each of the eight Great Lakes states. These workshops were an opportunity for state-level partners to influence the direction of potential future restoration actions in the Great Lakes, and to advocate for funding to be spent at state-prioritized locations for coastal management, Great Lakes Restoration Initiative, and habitat objectives.

The overarching purpose of these workshops was to convene stakeholders and partners and to identify shared coastal management principles, goals, priorities, currently available data sources, and outstanding data needs. Emphasis was on identifying, to the extent possible, place-based actions; partners who could support the planning, execution, and maintenance of restoration actions; and identifying and describing data needs associated with these preferred actions. To meet these objectives, state partners developed invitee lists that drew from a wide range of partners, including representatives from local, state, federal, and tribal organizations. A full summary of the workshop invitees and attendees is provided in Section 5. The workshop results are based on the events of the day and participants in attendance. Organizers made an effort to invite a representative, broad based group of experts. Results are not intended to replace or supplant any current or future planned processes.

This report covers the proceedings of the one-day workshop held in LaPorte, Indiana on Thursday, November 14, 2019 as well as the background materials used during the workshop.

1 Morning Session (9:00 AM – 12:00 PM)

1.1 Opening Remarks

Mike Molnar from the Coastal States Organization (CSO) started the meeting with introductions and by providing the following background on the workshops:

This series of workshops is an outgrowth of three years of work between CSO, the US Army Corps of Engineers (USACE), NOAA, other Federal Agency partners, and each of the Great Lakes State Coastal Programs to address coastal resiliency issues in the Great Lakes Region. Group efforts originally focused on developing scope of work, and securing funding for the Great Lakes Coastal Resiliency Study (GLCRS). The purpose of the proposed GLCRS was to assess coastal conditions, and develop a risk-based management approach for the next 50 years. While the GLCRS did not receive funding in the FY20 USACE budget, and future direction is uncertain at this time; this workshop is an outgrowth of the GLCRS discussions and an opportunity to align state habitat restoration needs with the EPA Great Lakes Restoration Initiative (GLRI) Action Plan. Funding for the workshops provided by agreement with NOAA Office for Coastal Management via US EPA GLRI Focus Area 4. State-level partners worked together to identify and numerically rank habitat restoration projects that align with the restoration goals identified by the GLRI Focus Area 4—Species and Habitat in the draft GLRI Action Plan III (USEPA, 2019). Priority Indiana projects should be focused on the region that extends from the Indiana boundary in Lake Michigan, inland to the boundary of the Great Lakes watershed. Data priorities can extend from the Indiana boundary in Lake Michigan to the boundary of each Indiana coastal county (Figure 1).

The goals of this workshop are to:

1. Identify shared coastal management principles and goals for Indiana.

2. Develop a list of coastal and nearshore habitat restoration projects for funding in FY21 and beyond that target habitat benefits for lake trout, walleye, lake sturgeon, yellow perch, cisco, and migratory birds, and waterfowl. And,

3. develop a list of available data, identify gaps, and prioritize data needs.

At the conclusion of all state workshops, NOAA will coordinate with other state and federal partners to identify funding mechanisms and determine potential projects to fund. NOAA OCM, NOAA Restoration Center, USFWS, USACE, USGS, EPA, and NFWF, amongst other funders, will look to this list for projects to fund.
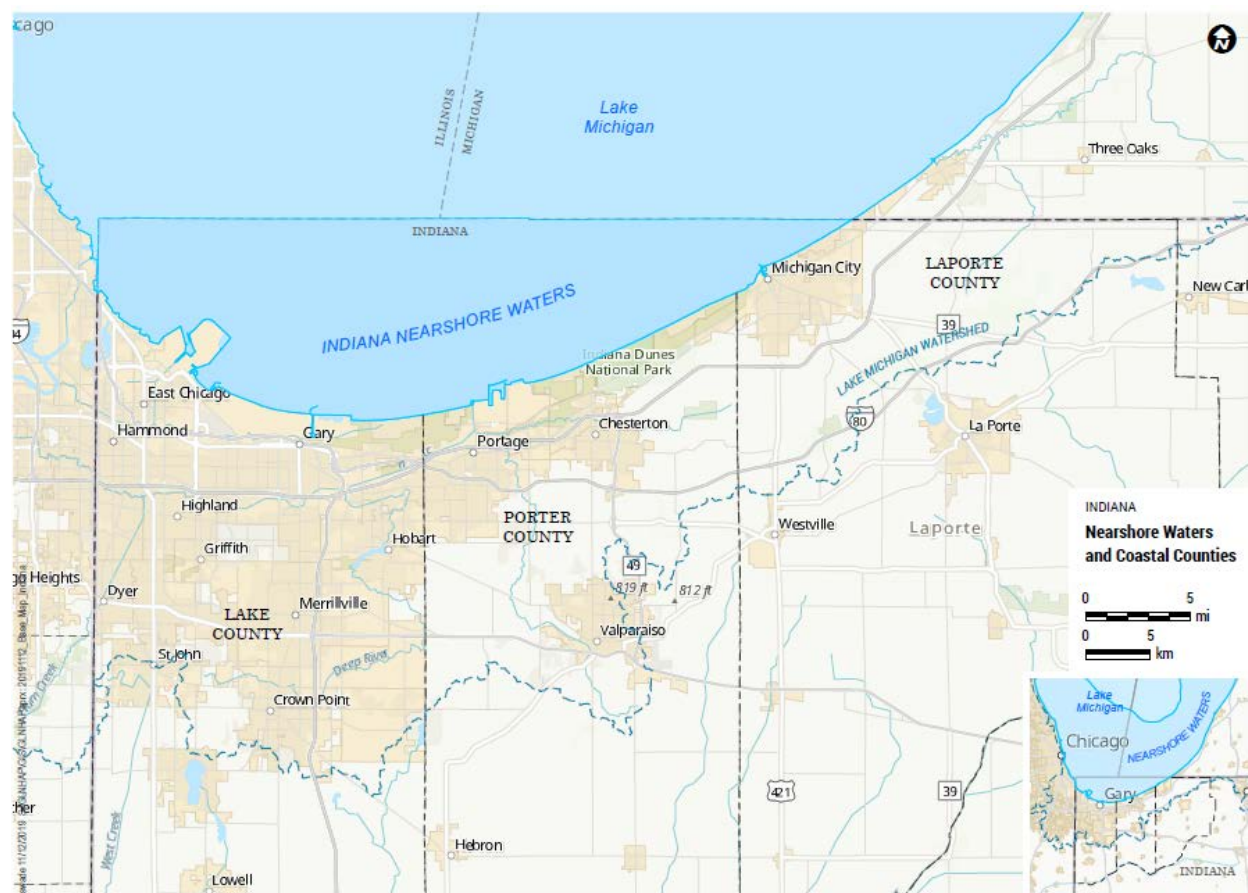
Figure 1. Map of the Indiana Study Area

1.2 Overview Workshop and Agenda

The workshop agenda is summarized in Table 1.

Table 1. Workshop Agenda

Workshop Segment	Purpose	Format
Introduction (9-9:20 AM)	Describe workshop purpose, preview agenda	Welcome and introductory statements
Icebreaker Activity (9:20-9:40)	Prepare group for interactive workshop	
Shared Principles and Goals: An overview of state and regional plans (9:40-10)	Prepare audience for discussions by providing overview of past communicated priorities, and identifying alignments with GLRI Action Plan III Focus Area 4	Very brief presentation summarizing state-level reports and GLRI Action Plan III Focus Area 4

Workshop Segment	Purpose	Format
Identification of Coastal Habitat Principles (10-10:45)	Start prioritization process by considering high-level principles guiding action	Small group brainstorming and reporting cycles for two questions prompting discussion
Mid-Morning Break		
Identification of Coastal Habitat Goals (11-12:00)	Transition to identification of regional or species-specific goals, target 3-5 goals per region	Small group brainstorming organized by region
Lunch Break		
Identifying and Prioritizing Projects and Locations: An overview of state and regional plans (12:30-12:50)	Prepare audience for discussions of project prioritization and data needs by summarizing past projects	Very brief presentation summarizing past projects
Identification and Prioritization of Project Locations (12:50-2:15)	Roughly identify extent of potential projects and prioritize these. Complete worksheets summarizing potential project details.	Small group identification of potential projects on physical maps organized by region or target species
Mid-Afternoon Break		
Overview of Data Availability (2:30-2:45)	Prepare audience for discussion of data gaps by summarizing presently available data	Very brief presentation of available data related to habitat
Collaborative Identification of Data Needs (2:45 – 3:45)	Identify data gaps and articulate why these data are needed. Complete worksheets summarizing data needs.	
Wrap-up and Evaluation (3:45 – 4)	Note forthcoming reports and request completion of evaluation forms	Paper evaluation form

1.3 Shared Principles and Goals: A Review of State and Regional Plans

Before working together to identify common habitat restoration goals and principles, LimnoTech staff gave a brief presentation highlighting regional principles and goals for habitat restoration in Lake Michigan. The purpose of this presentation was to help workshop attendees consider their own principles and goals related to habitat restoration.

LimnoTech first started by defining the terms "principles" and "goals", and then gave several examples from the GLRI Action Plan III and the Lake Michigan Biodiversity Conservation Strategy (Pearsall et al., 2012). Principles were defined as foundational science-based ideas that would influence action. Goals were defined as the desired result of an action. Principles and goals from the GLRI Action Plan III and The Lake Michigan Biodiversity Conservation Strategy are summarized in Figures 2 and 3. To link the regional plans to state-level planning efforts, LimnoTech also presented several principles and goals from the Indiana Statewide Wildlife Action Plan and the Indiana Conservation Action Planning Report (IDNR, 2015; IDNR, 2018). These principles and goals are summarized in Figure 4.

LimnoTech discussed how alignment exists between principles and goals defined in past reports and the objectives, commitments, and measures expressed in GLRI Action Plan III Focus Area 4 (Habitat and Species). Attendees were encouraged to identify alignment between their current principles and goals expressed during the workshop, and the GLRI action plan.

Figure 2. Summary of Focus Area 4—Species and Habitat Principles and Goals Excerpted from GLRI Action Plan III (USEPA, 2019)

Summary of Lake Michigan **habitat and species goals**

- **Nearshore Zone**
  - 75% of native nearshore fishes within each lake area
  - Late summer cladaphora < 30 gDW/m^2
  - 5-year chlorophyll-a from 0.5 – 3.0 ug/L
  - Shoreline hardening index < 20%
  - Annual sediment loads < 0.075 tons/ac
- **Migratory Fish**
  - >50% lake connectivity for each stream type
  - Each river-spawning fish has >=2 populations per assessment unit
  - Maximize tributary connectivity, minimize invasive risk
- **Coastal Wetlands**
  - Average wetland macrophyte index = good
  - 10% increase in coastal wetland area vs. 2011

- **Islands (n/a for Indiana)**
- **Coastal Terrestrial Systems**
  - >40% of coastal terrestrial system = natural land cover
  - Viable populations of priority nested targets across lake
  - >5% of coastal terrestrial system = good to excellent
  - Average artificial shoreline hardening index < 20%
  - High priority biodiversity areas minimally impacted by shoreline alterations
- **Aerial Migrants**
  - Targets for high quality of stopover habitat
    - >30% 2 km coastal area: migrating landbirds
    - > 10% coastal area: migrating shorebirds
    - > 50% 2 km coastal area: migrating waterfowl
    - > 80% 2 km coastal area: all groups in conservation ownership or management

From Lake Michigan Biodiversity Conservation Strategy, 2015.

Figure 3. Summary of Select Habitat Restoration Goals Presented in the Lake Michigan Biodiversity Conservation Strategy (Pearsall et al., 2012)

- Conserve all natural resources to **sustain economic development** and **contribute to quality of life**.
- Conserve habitats for **Species of Greatest Conservation Need** (SGCN).
- **Fragmentation reduces the connectivity** of natural areas across the landscape.
- **Invasives are costly** and severely damaging to native species and habitat structures.
- **Climate change** will likely favor generalist and invasives, and intensify droughts and flashiness.
- The **presence of pollutants disrupts** ecosystem function, encourages invasives, and threatens wildlife.
- **Some human activities are not compatible with ecological integrity**, including ATVs, unpermitted fires, creation of social trails, and dumping.
- **Clear-cutting reduces quality and quantity of topsoil**, and can negatively impact air quality.
- **Overabundance of white-tailed deer** has an adverse impact on vegetation and habitat.

Figure 4. Summary of Select Principles and Goals from Indiana State Level Reports (IDNR, 2015; IDNR, 2018)

LimnoTech discussed how alignment exists between principles and goals defined in past reports and the objectives, commitments, and measures expressed in GLRI Action Plan III Focus Area 4 (Habitat and Species). Attendees were encouraged to identify alignment between their current principles and goals expressed during the workshop, and the GLRI action plan.

1.4 Identifying Principles

During an approximately 45-minute interactive session, workshop attendees organized themselves into groups of approximately six people and responded to two prompts to articulate principles for successful project implementation on a state or regional level. These prompts were:

1. Thinking about a successful restoration project that you have been part of, what are the characteristics or qualities of the project that made it so successful? And,

2. What do you think are the key principles for achieving success in nearshore habitat restoration in the great lakes and/or your state?

For question #1, each small group reported out on three words or phrases representing the characteristics or qualities of a successful restoration project (Figures 5 and 6). The words and phrases could generally be broken into three broad categories: partnerships, planning, and support. The full results from the first prompt are summarized in Table 2.

For question #2, each small group reported out on three words or phrases representing the key principles underlying successful habitat restoration projects (Figure 7). The words and phrases could generally be broken into four broad categories. The first three aligned with the categories from question #1: partnerships, planning, and support. The fourth category was sustainability. This fourth category was identified after the workshop facilitator presented the first three categories of principles communicated by attendees, and asked participants whether any principles were missing from the three categories. The full results from the first prompt are summarized in Table 3.

Figure 5. Participants Working Together to Develop Common Principles
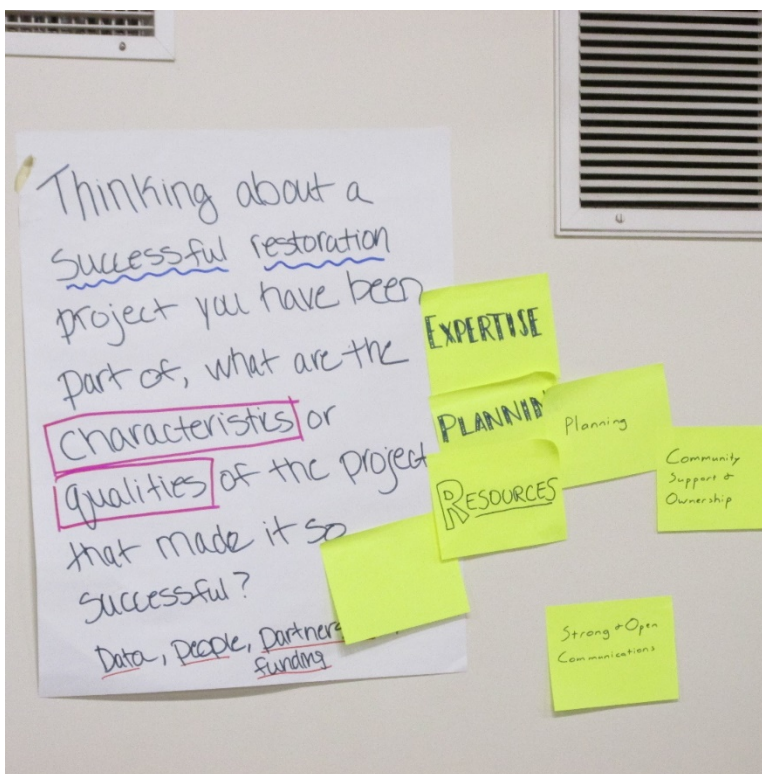
Figure 6. Snapshot of the Results from Question #1

Table 2. Summary of Characteristics for Question #1 Reported by Each Working Group

Category	Quality/Characteristic	Further Details	s
Partnerships and Planning	Planning		
	Teamwork	Include diverse partner and work together	
	Get stakeholders on board early and often		
	Realistic goals	Project goals should be achievable and measurable	
	Compromise	Partners need to be willing to compromise for different uses and objectives	
Support	Federal and state legislation	Appropriate legislation at both the federal and state level is needed to enable restoration project	
	Dedicated funding	The funding should be dependable and flexible	
Science and Data	Sufficient data to inform action, design, and maintenance	There should be enough data to inform all stages of the project planning process	
	Post restoration follow-up	Restoration projects should have follow-up work that includes site monitoring	

Figure 7. Snapshot of the Results from Question #2

Table 3. Summary of Principles for Question #2 Reported by Each Working Group

Category	Principle	Further Details	Multiple Mentions
Partnerships and Planning	Getting all stakeholders on board from the start		
	Managing and communication with diverse stakeholders	Buy in from stakeholders is a critical part of a successful project	Yes
Support	Funding	Funding should be flexible in order to meet needs related adaptive management, and consistent to ensure viability into the future	
Science and Data	Connection to relevant state and regional plans	Successful projects should mesh well with already identified priorities	
	Establishing an inventory of baseline data and improving knowledge transfer		Yes
	Establishment of priority targets	A good project should have a priority species, habitats, etc. in mind from the start	
	Measurable results and adaptive management	Time and opportunities to not only make adjustments and respond appropriately, but to conduct follow-up monitoring so there is an opportunity to observe or respond to secondary impacts	Yes
	Science and data driven decision making process		Yes
	Site functionality	Assessing past data to try and ensure project viability into the future Also using past data to determine the function of the system	Yes
	Identify socioeconomic benefits		

Category	Principle	Further Details	Multiple Mentions
Sustainability	Climate change	We need to consider strategic restoration in light of climate change	
	Realistic goals	The state has many post-industrial areas. Full restoration to pre-development state would be difficult.	
	Sustainability	A successful project should have some estimation of how long the project will last after completion and an estimate of the socioeconomic benefits	

1.5 Break (15-min)

1.6 Identifying goals

During an approximately 60-minute interactive session, workshop attendees worked together to identify a common set of goals that could be used to later prioritize habitat restoration projects. Participants self-organized into one of three groups: the nearshore region, the shoreland region, and the inland region (Figure 8). The nearshore region was defined as the area that extends from the Indiana Lake Michigan boundary to the ordinary high water mark. The shoreland area was defined as the area from the ordinary high water mark to US-12/I-90. The inland area was defined as the area from US-12/I-90 to the Lake Michigan watershed boundary. Each group was asked to develop 3 to 5 goal statements related to either a target species of interest or a region or location of interest (Figures 9 through 12).

When setting goals, participants were asked to be specific. Each goal statement needed to contain the following four elements:

1. The *subject or resource of concern*

2. The *characteristic or attribute* for the subject or resource of concern

3. The *desired future condition or conceptual target* for that attribute within a 10-year implementation timeframe

4. A measure, if possible

Using these four elements, an example of a full goal statement could be something like "hydrologic connectivity will be restored (by 10%) for fish species that spawn in upstream tributaries".

In developing goal statements, some groups also discussed data needs. In setting goals, both the nearshore and shoreland groups did not think there was sufficient baseline data to successfully develop goal statements. For example, it is difficult to set a goal related to a reduction target without a firm understanding of the baseline condition. Additionally, without baseline data, adaptive management can be a challenge.

Each small group reported its goal statements to the full group, and a nominal voting process was conducted to prioritize goals. The nominal voting process allowed all workshop participants to comment on goal statements that they were not able to directly participate in identifying. To vote, participants were given two dots for each region: one green and one red. For each region, participants had to select their highest priority using a green dot and their lowest priority using a red dot. The goal statements and the results of the nominal voting process are summarized in Table 4.

At the conclusion of this session attendees were asked for their feedback on the goal setting process. Many participants felt hampered by having to choose between the "nearshore", "shoreland", and "inland" group. Several participants remarked that allowing groups to integrate goals across regions would have resulted in more continuity across goal statements. This may have partially been due to several features unique to Indiana: first, the relatively small coastal area (45 miles), and second the fact that the state has many participants, land-holding agencies, and coastal partners have land, interests, and projects that span across the three designated regions (nearshore, coastland, and inland). Due to the size of the Indiana Coastal Area, the incredible diversity in such a relatively small area, and the overlap of efforts that tends to lend itself to more of a watershed approach to issues, that led to difficultly in participants compartmentalizing goals, efforts, and projects (which was characterized by some participants reassessing their place in a specific group).
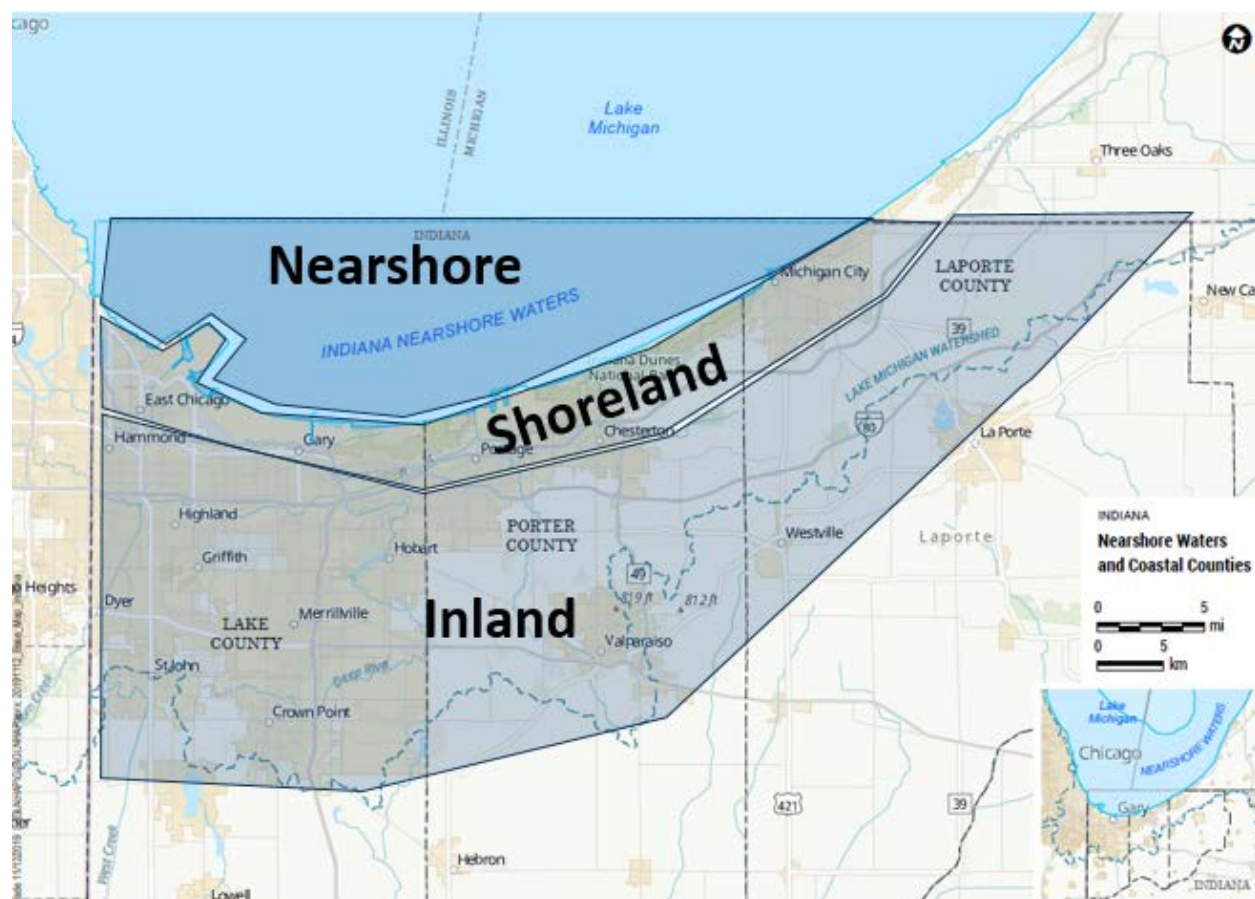
Figure 8. Map of the Indiana Shoreline and the Approximate Geographic Extent of the Three Groups: Nearshore, Shoreland, and Inland

Figure 9. Nearshore Group Developing Goal Statements

Figure 10. Shoreland Group Developing Goals Statements

Figure 11. Two Members of the Inland Group Working on Goal Statements

Figure 12. Nominal Voting on Goal Statements by Group

Table 4. Summary of Goal Statements by Region and the Results of the Nominal Voting Process

Region	Goal	Further Details	Green Dot	Red Dot
Nearshore	Increase fish habitat for various life stages of fish: lake trout, whitefish, yellow perch, and small mouth bass		17	3
	Prevent introduction of new aquatic invasive species		5	8
	Minimize impacts of aquatic invasive species		2	11
Shoreland	Increase hydrologic conductivity of habitats		8	8
	Increase/protect acres of functional wetland habitat		8	9
	Improve quality of habitats: aquatic, terrestrial and transitional		13	7
	Understand current habitat hydrology and stressors to better inform actions	We recognize this isn't really a habitat restoration goal, but more of a data goal. We still wanted to include it.	1	5
Inland	Reduce invasive plants by 10% in managed wetlands	We know we are missing baseline data to quantify this, but wetland health was important to us	11	2
	Surface water will be restored to increase stormwater storage by 5% so that diverse, self-sufficient biological communities are supported.		22	1
	Early detection of invasive plants will be prioritized, mapped, and controlled for no net gain within priority natural areas and managed lands	Our conversation started with "controlling invasive plants is a losing game. It's more realistic to control newly discovered AIS"	5	1

2 Afternoon Session (12:30 PM – 4:00 PM)

2.1 Identifying and Prioritizing Projects and Locations: A Review of State and Regional Plans

Before working together to identify and prioritize habitat restoration projects, LimnoTech staff gave a brief presentation highlighting the different types of restoration projects targeted by the GLRI and examples of both GLRI-funded habitat restoration projects and other types of habitat restoration projects that have been funded in the state. The purpose of this presentation was to provide some background of recently completed and planned projects in the state to help spur conversations between participants.

According to GLRI Action Plan III, the GLRI funds habitat restoration projects that target the "…protection, enhancement, rehabilitation, and restoration" of ecosystems. LimnoTech provided definitions for the four types of projects and examples of projects recently completed in Figures 13 and 14 (USEPA, 2016).

Protection:
The removal of a threat or prevention of decline in habitat quality. No net gain.

Example:

Purchase of land or easement

Enhancement:
The improvement of a specific function in existing habitat. No net gain.

Example:

Flow alterations in a wetland

Restoration (Re-establishment):
Rebuilding a former habitat. Net gain.

Example:

Removing shoreline hardening and restoring natural shoreline

Restoration (Rehabilitation):
Repairing natural/historic function in a degraded habitat. No net gain.

Example:

Removing invasive species that prevent native species from thriving

Figure 13. Types of Habitat Restoration Projects as Defined by USEPA (USEPA, 2016)

Restoration Type	GLRI Funded Projects	Indiana Funded Projects
Protection	2013 Miller Area Land Acquisition Acquisition of 0.5 acres of remnant dune	2017 Curtis Acquisition at Oak Ridge Prairie County Park 3.4 acres added to 965 ac park
Enhancement	2005 Oak Ridge Prairie County Park-Site enhancement and native plant project Removal of woody exotics on 66 acres	2005 Oak Ridge Prairie County Park-Site enhancement and native plant project Removal of woody exotics on 66 acres
Re-establishment	2012 Partners for Fish and Wildlife Program USFWS restoration of habitat on private lands	2004 Little Calumet River Prairie and Wetlands Among other activities, planting 4 acres of wetlands
Rehabilitation	2010 Elkhart River Dams Removal of two dams to improve fish access	2017 Restoration of Dune Acres Clubhouse Dune 6.1-ac of degraded savanna habitat for improved biodiversity and erosion

Figure 14. Examples of funded projects in the State of Indiana

2.2 Identifying and Prioritizing Locations

During an approximately 90-minute interactive session, workshop attendees brainstormed potential project locations and marked up maps to document these projects (Figures 15 through 17). Each group then presented three of their proposed projects, and summarized how these locations align with principles and goals for regional habitat restoration that were developed in the morning session.

After each region pitched their top three projects, all workshop attendees were given the opportunity to vote on them using green, blue, and orange sticky dots. Attendees were asked to rank the projects within each zone against each other in order to determine the top project in each zone. After workshop attendees voted, each project then received a score according to the scoring system summarized in Table 5. The three projects with the highest scores were then summarized as the first, second, and third top priority habitat restoration projects based on the consensus for workshop attendees. Table 6 summarizes additional discussion from the full group related to project prioritization.

After the ranking process, many attendees noted that this step was difficult because there was value in all of the proposed projects. To ensure that no project information was lost, all projects that were discussed by individual groups are included in Attachment A.

Figure 15. The Inland Group Discussing Proposed Project Locations

Figure 16. The Shoreland Group Discussing Proposed Project Locations

Figure 17. The Nearshore Group Discussing Proposed Project Locations

Table 5. Summary of Voting System

Dot Color	Rank	Point Value
Green	First	3
Blue	Second	2
Orange	Third	1

Table 6. Summary of Proposed Projects by Region

Region	Map #	Project	Further Details	Green (1st)	Blue (2nd)	Orange (3rd)	Score	Rank
Nearshore	1	Indiana shoals reef habitat restoration	• Project consists of several sites in historical spawning grounds • Still needs site characterization to focus exactly where proper restoration is. Army Corps and NOAA will do this next year. • Survey will cover 200 mi² • Project will restore 10 ac	6	1	0	20	3rd
	4	Clay valleys off of Michigan City, IN	• Similar to the Indiana shoals project but in a different site • Targets lake trout, whitefish, yellow perch • This region will also have an intensive survey	0	3	2	8	
	3	Address double crested cormorant impacts on larval yellow perch	• Located in East Chicago area • The goal is to reduce cormorant predation • The project would either reduce the cormorant population or work to increase larval perch survival • Estimated project size of 10 ac	0	2	2	6	
Shoreland	2	Restoration for 4 sites (Colorado St tract)	• This project is a partnership between The Nature Conservancy, Lake County Parks, US Army Corps • This project will improve onsite hydrology to promote migratory bird habitat • Right now the project size is unknown	0	3	0	6	

Region	Map #	Project	Further Details	Green (1st)	Blue (2nd)	Orange (3rd)	Score	Rank
			• The site plan for this project will be completed in 2020					
	3	Urban biodiversity and rehabilitation for Grand Calumet River connectivity	• This project is in East Chicago, an environmental justice community • The project would rehabilitate urban areas to ultimately restore ~100 acres	0	1	4	6	
	4	Enhancement and restoration of dune connectivity in Dunes National Park and State Park	• The park is currently composed of two sections divided by an industrial area (a combination of public/private land) • There are many restoration opportunities here as well as public/private partnership opportunities • Public and private partnerships • The current project is targeting 150 ac, but this could be increased to 300 acres • There are also 1,000 acres available for additional for connectivity restoration	3	0	4	13	
Inland	1 & 2	Burns Ditch restoration in Lake and Porter Counties	Burns Ditch is highly modified and the area is prone to flooding. • We want to create a two stage ditch, reconnect oxbows and use them for flow storage. • Requires land acquisition on farm fields/agricultural lands • This would improve habitat, restore connectivity to the floodplain, and reduce flooding	4	4	4	24	1st

Region	Map #	Project	Further Details	Green (1st)	Blue (2nd)	Orange (3rd)	Score	Rank
			• Target species include waterfowl, trout/salmon, spotted turtle, and maybe yellow perch • This would restore ~150 acres					

	7	Galien Headwaters in LaPorte County	• This stream travels from Indiana into Michigan and empties into Lake Michigan
			• This region current consists of higher quality forest and wetland habitats
			• This is a great pie in the sky project.
			• Currently, there are land conservation projects going on here. There are opportunities for:
			  o More conservation lands
			  o There are also forested wetland and stream enhancement opportunities
			  o There is a good dam removal project and culverts for fish passage
			• Acreage: Hundreds (could be a large macrosite)
				3	3	1	16	

	6	Derby Ditch restoration	• The National Park Service is currently restoring wetlands in Great Marsh • This project would remove Derby Ditch and restore historic flow to Great Marsh • This action would improve the water at the beach and could restore interdunal wetland • It's a two-step restoration process that would really benefit the national park	4	3	3	21	**2nd**

2.3 Break

2.4 Overview of Data Availability

Before working together to identify data needs, LimnoTech staff briefly presented our understanding of data gaps for the state of Indiana. Data gaps were described in terms of presence/absence, spatial resolution (low to high), and temporal resolution (low to high). As part of the data gap analysis, LimnoTech identified thirty-four types of data that could be useful for planning habitat restoration projects. This list of data types was generated after a review of papers produced as part of the Great Lakes Aquatic Habitat Framework (GLAHF) (Kovalenko et al., 2018; Wang et al., 2015) and an in-house review by a LimnoTech fish biologist.

In summarizing datasets, LimnoTech divided data sets into three groups: physical, biological, and environmental (Figures 18 through 21). A glossary of terms used in Figures 18 through 21 can be found in Section 6.

- **X**
  - We have found a dataset that matches the metric
- **OK**
  - sufficient level of information for project-scale work
- **LOW**
  - The resolution of the data is technically insufficient to complete project-scale work
- **MODERATE**
  - The resolution of the data is more coarse than desired to complete project-scale work, but useable
- **HIGH**
  - There is sufficient high-resolution to use this dataset for project scale work

Spatial Resolution	Temporal Resolution
Ok	Ok
Low	Low
Moderate	Moderate
High	High

Figure 18. Summary of Shorthand Used in Data Gap Analysis Presentation

Data Type	Present?	Spatial Resolution	Temporal Resolution	Notes
Discharge infrastructure: volumes and types				GAP
Ecoregions (ecoprovinces)	X	Ok	Ok	
Dams (river access)	X	Ok	Ok	
Road crossings	X	Ok	Ok	
Shoreline classification	X	Ok	Ok	
Stream mouths (watershed pour points)	X	Ok	Ok	
Watersheds	X	Ok	Ok	
Bottom ruggedness (rugosity)				GAP
Bottom slope	X	Low	Low	Derived depth & relief
Connectivity to adjacent habitats				GAP
Hydrogeoforms	X	Low	Low	Derived depth & relief
Relative exposure index (REI)				GAP
River substrate				GAP
Spawning reefs	X	Ok	An update?	Many old srcs, 2011
Substrate composition, variability, and distribution	X	Low	Low	2015, GLAHF 30-m
Water depth	X	High	Moderate	LMCP
Wave energy	X	Moderate	Moderate	USACE modeled results
Wave height	X	Low	High	GLOS buoy

Figure 19. Data Gap Summary for Physical Data

Data Type	Present?	Spatial Resolution	Temporal Resolution	Notes
Benthos (trophic str/func)	X	Moderate	Moderate	Federal points, most recent 2011
Coastal wetlands	X	Moderate	Ok	MTRI 12.5-m
Fish (trophic str/func)				GAP (CSMI focus area)
Plankton (trophic str/func)				GAP
Prevalence of invasive species	X	Moderate	Moderate	GLANSIS, most recent 2014 Phragmites stands
Submerged aquatic vegetation (presence/absence)	X	Low	Low	Mich. Tech Research Inst, 2012, 30-m
Vegetation density				GAP
Vegetation heterogeneity				GAP
Vegetation morphotype				GAP
Vegetation species composition				GAP

Figure 20. Data Gap Summary for Biological Data

Data Type	Present?	Spatial Resolution	Temporal Resolution	Notes
Chlorophyll-a				GAP
Turbidity				GAP
Suspended minerals				GAP
Water temperature (incl. timing/variability)	X	Low	Moderate	Derived from NOAA coastwatch satellite
Dissolved oxygen				GAP
Turbidity				GAP

Figure 21. Data Gap Summary for Environmental Data

2.5 Collaborative Identification of Data Needs

Data was discussed two ways during the workshop. The two-step approach was used to try to encourage and capture conversations related to data throughout the course of the workshop. The first method was to use a data wall (Figures 22 and 23). On the data wall, workshop participants had the opportunity to identify two types of datasets: those that they needed and those that they had. Participants were also able to qualitatively identify the spatial resolution of the data (ranging from basin scale to local scale) and the temporal resolution of the data (ranging from sampled once to sampled annually). Table 7 summarizes the data needs identified using the data wall. Additional workshop discussion items related to data needs follow this table.

The second way that data was discussed was by breaking the workshop participants into three groups according to their data expertise: physical, biological, and environmental data. During these discussions, participants identified the following data needs:

- Physical data
    - River substrate data
    - High resolution nearshore bathymetry
    - Habitat connectivity data
- Biological data
    - Communicating and assembling current data available (infrequent)
    - Baseline site-specific vegetative survey (low temporal frequency, high spatial resolution)
    - Egg and larval fish distribution presence absence (moderate temporal frequency, moderate spatial resolution)
- Environmental data
    - Sediment toxicity data for shoal restoration

Workshop participants also described several data sets to fill data gaps

- Physical data
    - Wave energy data is available from Purdue buoy and Michigan City buoy (2012-prsent). NDBC 45170.
        - Note: there is no winter wave data available from buoys (~October-April).

- o Great Lakes Observation System (GLOS) has been serving as a central bathymetry data repository.

  - o Check NPDES system for information about discharge infrastructure.

- Biological data

  - o Review data sets from the Cooperative Science and Monitoring Initiative (CSMI)

  - o Great Lakes National Program Office (GLNPO) has benthic data for many sites from annual cruises

  - o IDEM has data related to fish kills and contaminants

  - o IDNR has salmon and trout data for the St. Joe River. Contact Phillip Kochar.

- Environmental data

  - o Great Lakes National Program Office (GLNPO) has water quality data for many sites from annual cruises in the GLENDA database

  - o Water intake manager have turbidity data. This should be with USGS
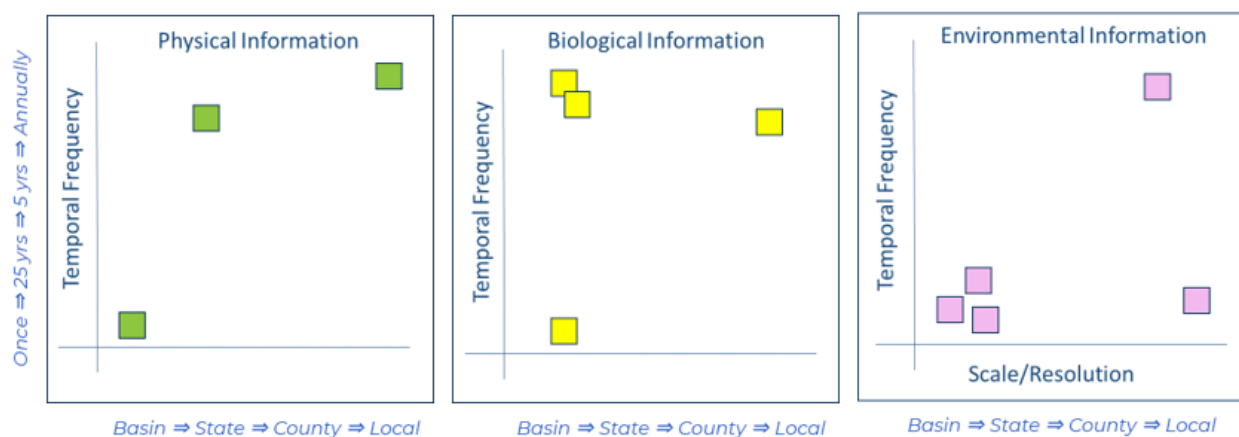
Figure 22. Conceptual Schematic of the Data Wall

Figure 23. Data Wall for Physical, Biological, and Environmental Data Sets

Table 7. Summary of Datasets Included on the Data Wall

Data Type	Have or Need	Description	Temporal Scale	Spatial Scale	Contact
Physical	Have	USEPA NARS habitat data for wetlands, tribs and nearshore	High	Low	
	Need	Winter lake wave data	High	Medium	
	Need	Location, size and quality of spawning subtract for many target [fish] species	High	High	
Biological	Have	Alewife Statistical Catch-at-Age model	High	Low	Lake Michigan Committee
	Have	Salmonid Statistical Catch-at-Age models	High	Low	Lake Michigan Committee
	Have	USGS bottom trawl forage survey	High	Low	Chuck Madenjan/Dave Werner Great Lakes Science Center
	Have	Ball State IN DNR Yellow Perch data set	High	Low	lkmichigan@dnr.in.gov
	Have	Indiana charter data from 1989-present about Phillip KACMS	High	Low	Phillip KACMS lkmichigan@dnr.in.gov
	Need	Recruitment bottle necks for target [fish] species poorly understood	High	High	
Environmental	Need	There is no NOAA CO-OPS water level station in Indiana	High	Low	

3 Workshop Summary

3.1 Workshop Findings

3.1.1 Common Principles

Workshop participants identified four common principles that underlie many successful habitat restoration projects:

1. They involve collaborative planning and stakeholder engagement that occurs early and often to make sure all voices are heard and to ensure that the project scope is appropriate, realistic, and achievable.

2. They require funding that is reliable so that planning for the future can occur. These funds should also be flexible enough to adapt to emerging project needs.

3. They use sound science and a data driven decision making process so that the effects of the restoration process can be quantified. And,

4. They are sustainable into the future and take into account a wide variety of environmental conditions.

3.1.2 Common Goals

The top common goal identified by workshop participants are summarized in Table 8. It should be noted that while workshop attendees were able to come to consensus around common goals, they also recognized that, in many cases, the current data is insufficient to quantitatively assess these goals. The types of baseline data that workshop attendees would like to collect are outlined in section 3.1.4.

Table 8. Summary of Top Goals for Each Region Identified by Workshop Participants

Region	Goal	Green Dot	Red Dot
Nearshore	Increase fish habitat for various life stages of fish: lake trout, whitefish, yellow perch, and small mouth bass	17	3
Shoreland	Improve quality of habitats: aquatic, terrestrial and transitional	13	7
Inland	Surface water will be restored to increase stormwater storage by 5% so that diverse, self-sufficient biological communities are supported.	22	1

3.1.3 Identification of Workshop Priorities

The results from the habitat restoration project prioritization process are summarized in Table 9. For further details about the projects in the table, see section 2.2. For further information about projects that were not ranked, please see Attachment A.

Table 9. Summary of Ranked Indiana Habitat Restoration Priorities Developed by Workshop Participants

Region	Map #	Project	Rank
Inland	1 & 2	Burns Ditch restoration in Lake and Porter Counties	1st
	6	Derby Ditch restoration	2nd
Nearshore	1	Indiana shoals reef habitat restoration	3rd

3.1.4 Data Needs

Several data needs were discussed by workshop participants. In general, the following data needs were identified during discussion:

- Physical data
    - River substrate data
    - High resolution nearshore bathymetry
    - Habitat connectivity data
- Biological data
    - Communicating and assembling current data available (infrequent)
    - Baseline site-specific vegetative survey (low temp, high spatial)
    - Egg and larval fish distribution presence absence (mod temp, mod spatial)
- Environmental data
    - sediment toxicity data for shoal restoration

The following data sets were identified as needs using the data wall:

- Physical data
    - Winter lake wave data
    - Location, size and quality of spawning subtract for target fish species
- Biological data
    - Recruitment bottle necks for target species poorly understood
- Environmental data
    - There is no NOAA COOP water level station in Indiana

3.2 Next Steps

At the end of the workshop, Mike Molnar, from CSO, briefly discussed the next steps involved in this process:

- Information organization: we will sort through all the great information and develop a report that is to be shared with the coastal program

- Data gap filling: select data gaps identified during this workshop and others will be addressed for a limited portion of the shoreline from April 2020 through March 2021

- NOAA will be able to fund some engineering and design work for a subset of projects.

- Federal partners with funding available will convene during the spring to discuss the project priorities identified in the state-specific workshop and their potential fit with various funding streams.

- Continue the conversation – today has been a great conversation starter. We encourage you to continue the discussion among yourselves and partners.

4 References

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5 Workshop Attendee Summary

Breakdown of workshop invitees:
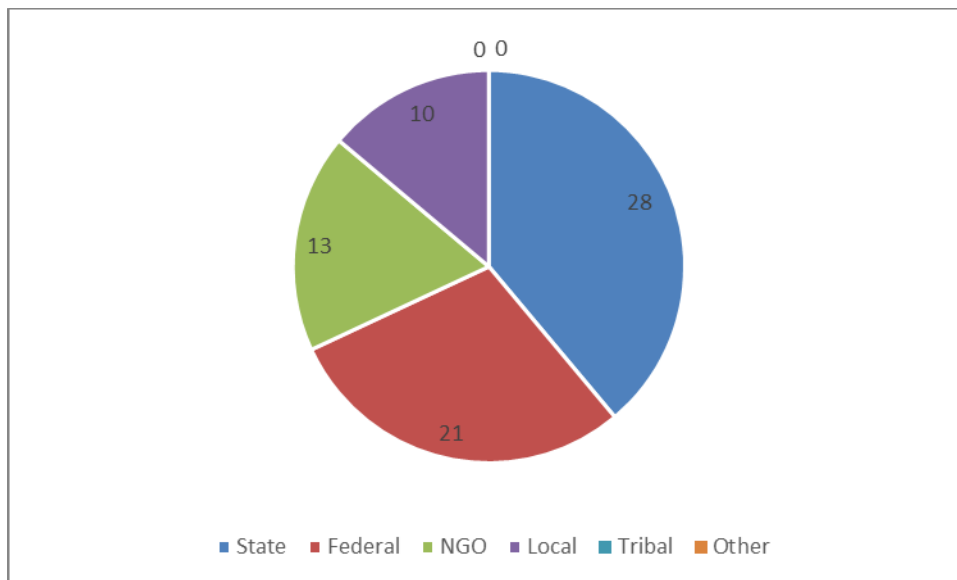
Breakdown of workshop participants:
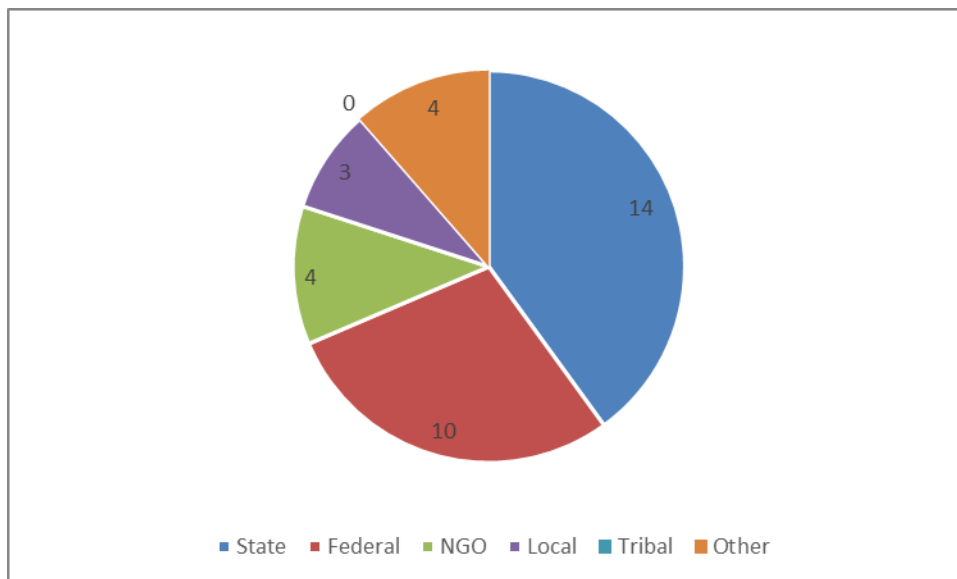
The table below summarizes workshop participants:

Last	First	Affiliation
Alexander	Kacey	Indiana DNR
Birchfield	Jennifer	Purdue University-Northwest
Blackburn	Julie	RESPEC
Bradley	Doug	LimnoTech
Brindza	Randy	Lake Michigan Fisheries
Brinks	Linden	Great Lakes Observation System
Charlebois	Patrice	University of Illinois
Choi	Young	Purdue University-Northwest
Ciara	Bri	Indiana DNR
Dickinson	Ben	Indiana DNR
Dorworth	Leslie	Purdue University-Northwest
Exl	Joe	Northwestern Indiana Regional Planning Commission
Goldfarb	Daniel	Wildlife Habitat Council
Grush	Jeremy	LimnoTech
Heatlie	Terry	NOAA
Hinchey Malloy	Elizabeth	US Environmental Protection Agency
Kacmar	Phillip	Indiana DNR
Krumwiede	Brandon	NOAA
Lenckos	Walter	Porter County
McClain	Kaitlyn	US Army Corps of Engineers
McCloskey	Elizabeth	Fish and Wildlife Service
Molnar	Mike	Coastal States Organization
Mountz	Elizabeth	NOAA
Nimetz	Derek	Indiana DNR
Orsburn	Jenny	Indiana DNR
Padilla	Julie	LimnoTech
Roman	Grace	Indiana DNR

Last	First	Affiliation
Sobecki	Jeremy	LaPorte County Parks
Spinar	Michael	Indiana Dept of Env. Mgmt
Troy	Cary	Purdue University
Tyson	Jeff	Great Lakes Fishery Commission
Vallis	Kathryn	Indiana DNR
Wodrich	Carl	Indiana DNR
Potthoff	Johnna	US Army Corps of Engineers
Donnelly	Peg	USEPA
Mason	Dan	National Park Service

6 Glossary

Benthos: biotic organisms that are found at the bottom of water bodies.

Ecoregion: A major ecosystem that has a unique geography and receives consistent sunlight and moisture.

Hydrogeoforms: Underwater geologic structures. Hydrogeoforms include features such as underwater reefs, plains, and ridges.

Relative exposure index (REI): The relative exposure index is the effective fetch of a waterbody scaled by mean wind speed. The effective fetch is the length of a waterbody where the wind blows in a consistent direction. Together, fetch and wind speed determine wave size and energy. Ultimately, areas with lower relative exposure index provide better fish habitat.

Trophic structure/function (trophic str/func): Describes the relationship between different organisms within the food web of an ecosystem.

Attachment A

Project Summary Worksheets

Priority Project and Location Worksheet **NEAR**

Project number: __1, 2, 4, 5__

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __Increase fish hab__

2. Which goal statements does this project *support?* __Increase fish hab__

3. The project category (circle one):
   Protection   (Enhancement)   Restoration (reestablishment)   (Rehabilitation)

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): __NOAA OCS multi-beam survey from Michigan City to East Chicago → ID reef habitat in Indiana Shoals and characterize__

5. The desired change that the project intends to accomplish (improve/restore/reduce): __Use data collected to priorite restoration areas__

6. Targeted species that benefits from actions: __Lake trout, whitefish, yellow perch   ✓especially Indiana Shoals__

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* __Up to 10 acres reef restoration, ~200 square miles survey__

8. Current/past condition of the site: __Unknown → this project seeks to clarify current state__

9. Social, political and physical context of the project: __Economic impact recreational fishery   Increased resilience of ecosystem__

10. Potential partners: __NOAA, USFWS, IN DNR, GLFC, IESG, USGS   NPS, Purdue, MI DNR   → DFW coastal__

11. Unmet data needs: __Site characterization/location   hydrodynamics of local area   water quality   biological utilization of existing habitat   sediment quality__

12. Readiness (1=ready!; 5=concept stage):   1   2   (3)   4   5

Priority Project and Location Worksheet

NEAR

Project number: _____3_____

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __Fish habitat__

2. Which goal statements does this project *support?* __fish habitat__

3. The project category (circle one):
   (Protection)   Enhancement   Restoration (reestablishment)   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   Alter habitat at Inland Steel to be less attractive to DCCO (Cormorants)
   ^ Cormorant

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   Reduce predation on larval/juvenile Yellow Perch

6. Targeted species that benefits from actions:
   Yellow Perch

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: 10 acres

8. Current/past condition of the site:
   Highly favorable to cormorants (5,000 t)

9. Social, political and physical context of the project:
   Cormorants very political. Anglers detest some environmentalists against control, other waterbirds nesting in same areas

10. Potential partners:
    USFWS, IN DNR

11. Unmet data needs: What suitable habitat and proper techniques to deter nesting (and legal)

12. Readiness (1=ready!; 5=concept stage):   (1)   2   3   4   5

NEAR

Priority Project and Location Worksheet

Project number: _____

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? _____

2. Which goal statements does this project *support*? _____

3. The project category (circle one):

    Protection   Enhancement   Restoration (reestablishment)   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):

    _____

    _____

5. The desired change that the project intends to accomplish (improve/restore/reduce):

    _____

    _____

6. Targeted species that benefits from actions:

    _____

    _____

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: _____

8. Current/past condition of the site:

    _____

    _____

9. Social, political and physical context of the project:

    _____

    _____

10. Potential partners:

    _____

    _____

11. Unmet data needs:

    _____

    _____

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   5

shoreland

Priority Project and Location Worksheet

Project number: _____1_____

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __#3 Improve quality- habitat__

2. Which goal statements does this project *support?* __#3 Improve quality__

3. The project category (circle one):

   Protection   Enhancement   (Restoration (reestablishment))   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   __Invasive species removal (plants)__

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   __Improve habitat; restore functionality__

6. Targeted species that benefits from actions:
   __Wetland plants, migratory birds__

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* __~ 100 acres__

8. Current/past condition of the site:
   __Degraded__

9. Social, political and physical context of the project:
   Physical - Located on Purdue University NorThwest
   Political - City of Hammond / Purdue University (Northwest) & Purdue Research Foundation
   Social - Purdue University Northwest - Faculty/Staff/Students
   - local citizens

10. Potential partners:
    US. Army Corps of Engineers, IDNR, IDEM, Purdue University NorThwest, local citizens, Purdue University Northwest community
    EPA

11. Unmet data needs:
    Army Corps had been arounded The site and has data from ovad.

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   5

shorland

Priority Project and Location Worksheet

Project number: ___5___ / Whihala Beach

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __Improve quality habitat__

2. Which goal statements does this project *support?* _____ u _____

3. The project category (circle one):

   Protection   Enhancement   (Restoration (reestablishment))   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   Habitat restoration - dune + swale ; also increase fish habitat nearshore

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   prevent erosion, decrease stormwater runoff ; stabilize + create nearshore habitat

6. Targeted species that benefits from actions:
   fish, shore birds, migratory birds

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* > 20 acres

8. Current/past condition of the site:
   Urban beach, stormwater runoff causes high bacteria

9. Social, political and physical context of the project:
   beach closures frustrate local residents + beach managers ; need more southern Lk MI fish habitat

10. Potential partners: (Whiting
    USEPA, IDEM, municipalities, USACE

11. Unmet data needs:
    modeling of wave actions

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   -5   (6)

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Shorland

Priority Project and Location Worksheet

Project number: __6__

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __Shoreland goal 3__

2. Which goal statements does this project *support?* __potentially nearshore goals__

3. The project category (circle one):

    Protection   Enhancement   ⬭Restoration (reestablishment)⬭   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
    __Habitat restoration along shoreline at power plant to be decommissioned by 2028.__

5. The desired change that the project intends to accomplish (improve/restore/reduce):
    __Restore natural shoreline__

6. Targeted species that benefits from actions:

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: _____

8. Current/past condition of the site:
    __Coal Power Plant__

9. Social, political and physical context of the project:
    __property will be given to Michigan City. Residents will want access and recreation__

10. Potential partners:
    __Michigan City. Save the Dunes__

11. Unmet data needs:
    __Cost. Contaminants. Resident/municipal intended use.__

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   ⑤

shoreland

Priority Project and Location Worksheet

Project number: 9 *Portage Park Lakefront dune restoration*

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? #3 Improve quality habitat

2. Which goal statements does this project *support*? #3 "

3. The project category (circle one):

    Protection   Enhancement   (Restoration (reestablishment))   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): restore foredune habitat / protect fish habitat

5. The desired change that the project intends to accomplish (improve/restore/reduce):

6. Targeted species that benefits from actions:

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*:

8. Current/past condition of the site: Dunes eroding due to high water levels, increased wave action, human structures/breakwater walls

9. Social, political and physical context of the project: NPS lakefront paths not accessible + beach dangerous

10. Potential partners: NPS

11. Unmet data needs:

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   5

shoreland

Priority Project and Location Worksheet

urban biodiversity & rehabilitation for Grand Cal

connectivity

Project number: _____3_____

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? Urban Canopy & Rehabilitation *Biodiversity* of ~~Urban canopy~~ of habitat

2. Which goal statements does this project *support*? Rehabilitation of degraded urban areas to increase canopy, reduce run off, sequester air pollution

3. The project category (circle one):

   Protection   Enhancement   Restoration (reestablishment)   **Rehabilitation** ✓

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   Removal of invasives, seeding & planting understory, reclaiming wetlands and planting native trees along Grand Cal Rrvr & nearshore areas (Public & Private)

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   Increase canopy cover, increase native vegetation local migratory areas within urban environmental justice community

6. Targeted species that benefits from actions:
   Pollinators, migratory birds, shorebird habitat on degraded wetlands, increase tree, shrub & Biodiversity

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* Rehabilitation acreage is large ~200 - 400 Acres restoration acreage ~100 (outside managed lands)

8. Current/past condition of the site:
   Mostly all degraded, wetlands have invasive terrestrial have more shovel ready potential

9. Social, political and physical context of the project:
   Environmental justice designated communities Disadvantaged & minority, working neighborhood

10. Potential partners:
    USFS, Urban Waters, IDNR Coastal, WHC, Heinze Land Trust & multiple companies interested & participation

11. Unmet data needs:
    Urban biodiversity, shoreline vegetation, Data not easily accessible from agencies

12. Readiness (1=ready!; 5=concept stage):   1   (2)   3   4   5

Shore land

Priority Project and Location Worksheet DUNES

Project number: ___4___

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT. ~~IDNR~~ ENHANCEMENT & RESTORATION OF NPS CONNECTIVITY

1. Which goal statement does this this project *primarily* address? Enhancement & Restoration of Habitats (Industry, Port of Indiana, Portage & BH comm)

2. Which goal statements does this project *support?* Improve Quality of habitats connecting East & West sections of the Indiana Dunes NP

3. The project category (circle one):
   Protection   (Enhancement)   (Restoration (reestablishment))   (Rehabilitation) Reclamation?

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): We propose to plan & implement a combination of ~~cut~~ enhancement, restoration, and rehabilitation of terrestrial habitats located on industrial, port & municipal lands to connect both sections of the Dunes NP

5. The desired change that the project intends to accomplish (improve/restore/reduce): Increase habitat, population, and spp connectivity ~~between~~ (local movement of species), and increase solutions to runoff, carbon sequestration, etc.

6. Targeted species that benefits from actions: Migratory bird habitat, potential significant increase of shorebird habitats, sand prairie, jack pine & black oak & significant Black oak forest barrens

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* ~300 inside industrial facilities ~1,000 outside but privately owned

8. Current/past condition of the site: Varies depending of natural, degraded and impacted

9. Social, political and physical context of the project: Huge opportunity to reclaim industrial, post-industrial and natural areas for stewardship & tourism

10. Potential partners: Port of Indiana, ArcelorMittal, Worthington Steel, Primary Energy US Steel, City of Portage, Town of Burns Harbor, USNPS, IDNR, Wildlife Habitat Council & USACE, & USEPA (Urban waters)

11. Unmet data needs: Connectivity, migratory fish habitat on breakwalls

12. Readiness (1=ready!; 5=concept stage):   (1)!   2   3   4   5

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shorland

Priority Project and Location Worksheet

Project number: 2

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? #3 Improve quality of habitat

2. Which goal statements does this project *support*? #2 Increase/protect functional habitat

3. The project category (circle one):
   Protection   (Enhancement)   Restoration (reestablishment)   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): Enhancement at 4 existing wetland sites to A) improve habitat for birds & B) enhance stream functionality of Little Cal River

5. The desired change that the project intends to accomplish (improve/restore/reduce): improve quality by ↓ invasive vegetation & restoring hydrology

6. Targeted species that benefits from actions: migratory birds/waterfowl

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* 4 sites (Highland Rookery, MLK North+South, Colorado St. tract)

8. Current/past condition of the site: overrun by phragmites, not high functioning, stream does not have natural meander

9. Social, political and physical context of the project: can't impact levee system, must work with Little Cal River Basin Development Commission.

10. Potential partners: TNC, The Wetlands Initiative, Lake Co Parks, GL Audubon is currently working w/ USACE to do Planning Assistance to State study to produce site designs for 4 sites

11. Unmet data needs: longterm monitoring data

12. Readiness (1=ready!; 5=concept stage):   1   (2) — plans complete by FY21   3   4   5

INLAND

Priority Project and Location Worksheet

Project number: ___7___ Galien Headwater

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? ___2___

2. Which goal statements does this project *support*? _____

3. The project category (circle one):

   ⟨Protection   Enhancement   Restoration (reestablishment)   Rehabilitation⟩

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   ~~fish~~ fish barrier removal w/ wetland reconnection ditch mods for storage + habitat improve

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   Improve connectivity & storage

6. Targeted species that benefits from actions:
   Cool/cold water fish species

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: _____

8. Current/past condition of the site:
   Rural, forested, some row crop + equistrian

9. Social, political and physical context of the project:
   Private land

10. Potential partners:
    IN DNR, in lue fee, La Porte County Parks, LaPorte County conservation trust, LaPorte County soil and water, NRCS Division of Fish & wildlife.

11. Unmet data needs:
    baseline data, private,

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   ⑤

INLAND

Priority Project and Location Worksheet

Project number: #6 Derby Ditch   INLAND

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? Hydrology ↓2

2. Which goal statements does this project *support?* #2 restoration of surface Hydrology

3. The project category (circle one):

   Protection   (Enhancement)   (Restoration (reestablishment))   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   Derby Ditch / Wyland Ditch Restoration. Restore Wetland near Wyland Ditch

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   Restore hydrology. ↓ e coli from goes to the heach (filter thru wetlands)

6. Targeted species that benefits from actions:
   Waterfowl, maybe some fisheri wetland plant species (state listed)

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: 100 Acres + wetland reckmeti

8. Current/past condition of the site:
   Ditched Areas

9. Social, political and physical context of the project:
   provide view sheds for park visitors. Improve beach Access by ↓ e.coli.

10. Potential partners:
    NPS, State Park

11. Unmet data needs:
    Need to compute hydrology studies esp. @ Wyland Ditch How much H2O goes to state Park?

12. Readiness (1=ready!; 5=concept stage):   1   2   3   (4)   5

Indiana Workshop: November 14, 2019

Dan Mason is the contact

1 of 1

INLAND

Priority Project and Location Worksheet

Project number: #4 Brown Ditch INLAND

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __Storage / help restore wetled__

2. Which goal statements does this project *support?* __Surface H₂O storage__

3. The project category (circle one):
    Protection　　(Enhancement)　　(Restoration (reestablishment))　　Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): __restoration of Hydrology of Ditch drawing into National Park__

5. The desired change that the project intends to accomplish (improve/restore/reduce): __restore hydrology, improve water quality__

6. Targeted species that benefits from actions: __waterfowl & other species__

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc):* __140 - 150 acres__

8. Current/past condition of the site: __It's A Ditch.__

9. Social, political and physical context of the project: __lots of support__

10. Potential partners: __Indiana Dunes National Park Service (this is NOT A good candidate for NOAA funding but could be for GLRI__

11. Unmet data needs: __Need to finish EA (in progress)__

12. Readiness (1=ready!; 5=concept stage):　1　(2)　3　4　5

~~just~~ finishing up EA

Don Mason is contact

INLAND

Priority Project and Location Worksheet

Project number: __1 + 2   INLAND__

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? __INCREASING STORM H_2O STORAGE~~ ~~__

2. Which goal statements does this project *support*? __"__

3. The project category (circle one):

   (Protection)   Enhancement   Restoration (reestablishment)   (Rehabilitation)

[left margin, handwritten:] PROJECT #2 IS THE IDEA OF MAKING MORE OF BURNS DITCH IN LAKE + PORTER CO 2-STAGE DITCH. REDUCE SOME AG LAND ACQUISITION

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): ~~xxxxxxxxxx~~. AREA PRONE TO FLOODING : BURNS DITCH HIGHLY MODIFIED. ~~xxx~~ CREATE 2-STAGE + RECONNECT OXBOWS TO USE FOR FLOOD STORAGE BY LAND ACQUISITION ON FARM FIELD IN BIT DNR NATURE PRESERVES LAND + DITCH

5. The desired change that the project intends to accomplish (improve/restore/reduce): IMPROVE HABITAT, RESTORE FLOODPLAIN CONNECTION, REDUCE FLOODING

6. Targeted species that benefits from actions: WATERFOWL, TROUT + SALMON, YEP? SPOTTED TURTLE

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: ~~100 AC +~~ ~150 AC

8. Current/past condition of the site: ~~FALLOWED AG LAND, OLD OXBOWS~~ TENNANT AG. GROUND, OLD OXBOWS

9. Social, political and physical context of the project: LAKE CO, HIGHLY URBANIZED AREA, BURNS DITCH HIGHLY MODIFIED

10. Potential partners: IN DNR NATURE PRESERVES, ~~xx~~ REGIONAL PLANNING COMMISSION, LAND OWNER/COUNTY, CITY, ~~xx~~ NATIONAL PARK SERVICE, LOTS

11. Unmet data needs: ENGINEERING/HYDROLOGY STUDY, HOW WOULD H_2O REACT TO PROPOSED AREA? HOW MUCH STORAGE WOULD BE CREATED? HABITAT MODELING FOR SPP.

12. Readiness (1=ready!; 5=concept stage):   1   2   3   4   (5)

INLAND

Priority Project and Location Worksheet

Project number: _____ 3 INLAND _____

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? #2 Surface Water Restored

2. Which goal statements does this project *support?* _____

3. The project category (circle one):

   Protection   Enhancement   ⟨Restoration (reestablishment)   Rehabilitation⟩

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal): Wetland restoration & rehabilitation.

5. The desired change that the project intends to accomplish (improve/restore/reduce): ~~Restore a improve~~ Improve watershed storage

6. Targeted species that benefits from actions: Warmwater fish species, herps, waterfowl, shorebirds

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: 11 - 20 +

8. Current/past condition of the site: Drained wetland & agricultural land (current)

9. Social, political and physical context of the project: Current working Ag land.

10. Potential partners: SWCD, NRCS, Lake County Parks

11. Unmet data needs: Engineering & design

12. Readiness (1=ready!; 5=concept stage):   ~~1~~   2   3   4   ⑤

INLAND

Priority Project and Location Worksheet

Project number: ___5___ INLAND

NUMBER THIS PROJECT ACCORDING TO DIRECTIONS PROVIDED DURING THE WORKSHOP. THEN WRITE THE SAME PROJECT NUMBER ON A STICKY DOT AND ATTACH THE STICKY DOT TO THE LOCATION ON THE MAP THAT CORRESPONDS TO THIS PROJECT.

1. Which goal statement does this this project *primarily* address? ___#2___

2. Which goal statements does this project *support?* _____

3. The project category (circle one):
   Protection   Enhancement   (Restoration (reestablishment))   Rehabilitation

4. The proposed action (invasive species removal, wetland restoration, shoreline stabilization, fish barrier removal):
   Restoration of wetlands (& ditch/streams) in drained ag land

5. The desired change that the project intends to accomplish (improve/restore/reduce):
   Restore wetland, improve water quality

6. Targeted species that benefits from actions:
   _____
   _____

7. Spatial extent/acreage *(maybe we could provide a range for them to circle such a ,5 acres, 6-10 acres, 11-20 acres, etc)*: _____

8. Current/past condition of the site:
   Former wetland, now drained ag

9. Social, political and physical context of the project:
   adjacent to protected land. Actively farmed.
   Cross-county, headwaters

10. Potential partners:
    LaPorte Co, Porter Co. INDOT, SWCD/NRCS

11. Unmet data needs:
    _____
    _____

12. Readiness (1=ready!; 5=concept stage):   1   2   3   (4)   5