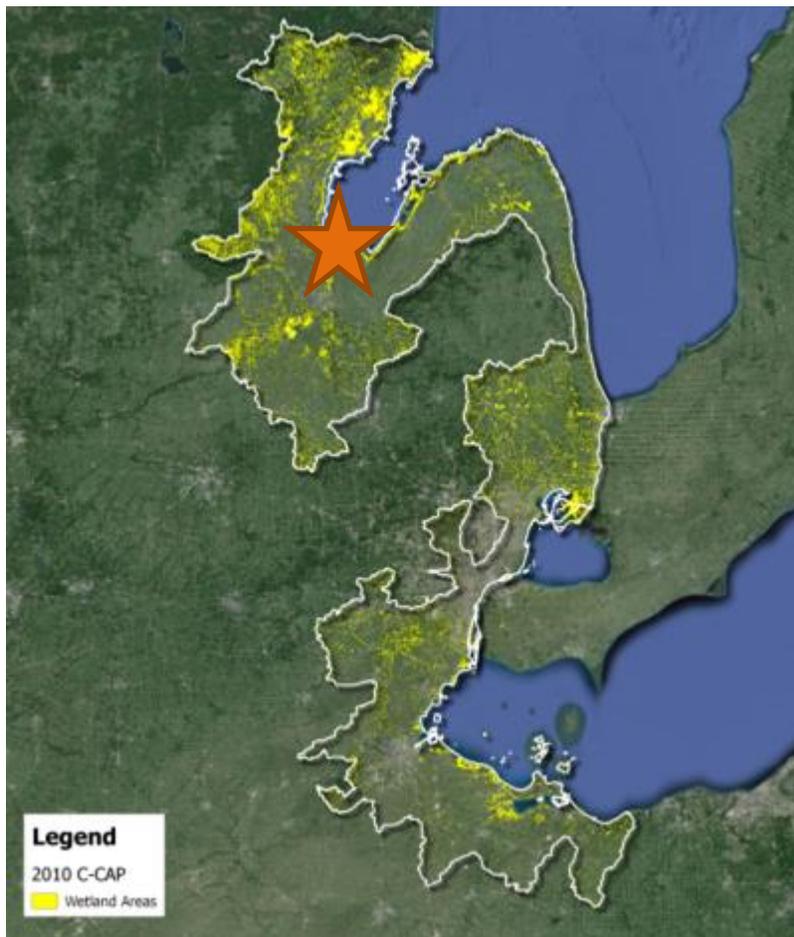


# Designing the Coastal Wetlands of Tomorrow: Collaborative Conservation from Saginaw Bay to Western Lake Erie

Tuesday, March 8<sup>th</sup>, 2016  
Horizons Conference Center  
6200 State St., Saginaw, MI

## Workshop Report



# What is in this Report?

This report summarizes, organizes, and interprets information captured from participants attending the “Designing Coastal Wetlands of Tomorrow” workshop on March 8th, 2016 in Saginaw, MI. The introduction below includes brief context on the workshop objectives and the larger overall effort. This report does not include information on the presentations that set the context for the conversations throughout the day. Copies of all the presentations and other workshop materials can be found here: <https://greatlakeslcc.org/event/designing-coastal-wetlands-tomorrow-meeting>

## Introduction

While some high quality Great Lakes coastal wetlands remain, over time many historic coastal wetland areas have been damaged or converted to other uses, with loss of their attendant benefits such as fish and wildlife production, infrastructure protection, and recreation. For decades, conservation agencies have worked to restore, enhance, and protect wetlands to reverse these losses and recover the benefits, but these efforts have been conducted in the absence of regional goals and general lack of coordination across the basin. Therefore, the Coastal Conservation Working Group (CCWG) of the Upper Midwest and Great Lakes Landscape Conservation Cooperative (UMGL LCC) is initiating a collaborative process to understand the current state of coastal wetland conservation and facilitate the identification of regional coastal wetland conservation goals and how to best pursue them. Over time the group will explore important questions such as: For what purposes should coastal wetland conservation target? How many restored and protected wetland acres are enough to attain desired benefits? Which coastal wetlands and features will maintain these benefits with future environmental and landscape change? How much will it cost to restore and protect these wetlands? The answers to these questions, incorporated into a conservation design, are intended to help conservation agencies, organizations and funders target resources to the highest priority locations and actions.

## Seeking a Collaborative Solution

The CCWG initiated a Landscape Conservation Design (LCD) process to bring together the coastal wetland conservation community to identify the highest priority, resilient, coastal wetland conservation projects. The LCD geography extends from Saginaw Bay in Lake Huron (northernmost terminus is Tawas Point, MI) to Western Lake Erie (southern terminus is Old Woman Creek, OH). A mix of presentations and facilitated conversations were used throughout the day to attain the following workshop objectives.

### Workshop objectives

- Initiate a coastal collaboration focused on conserving coastal wetlands across the landscape

- Provide background on Upper Midwest and Great Lakes LCC and Landscape Conservation Design (LCD)
- Identify needs and products that would be most useful to regional stakeholders
- Gain meaningful feedback on coastal wetland targets (beginning to identify our collective goals)
- Identify individuals that are missing and invite them to potential Webinar-based meeting

## The Landscape Conservation Design Process

Landscape Conservation Design (LCD) is an iterative, collaborative, and holistic process that provides information, analytical tools, spatially explicit data, and best management practices to develop shared conservation strategies and to achieve jointly held conservation goals among partners. The overall process includes many specific and detailed steps, but for the workshop 4 basic elements were used: 1) Set targets & goals, 2) Gather data, 3) Conduct analysis & map, and 4) Implement. The facilitated conversations at the workshop were designed to uncover information from the participants within each of these elements, except “gather data” (Figure 1). As such, this report is organized using the same 4 basic elements.

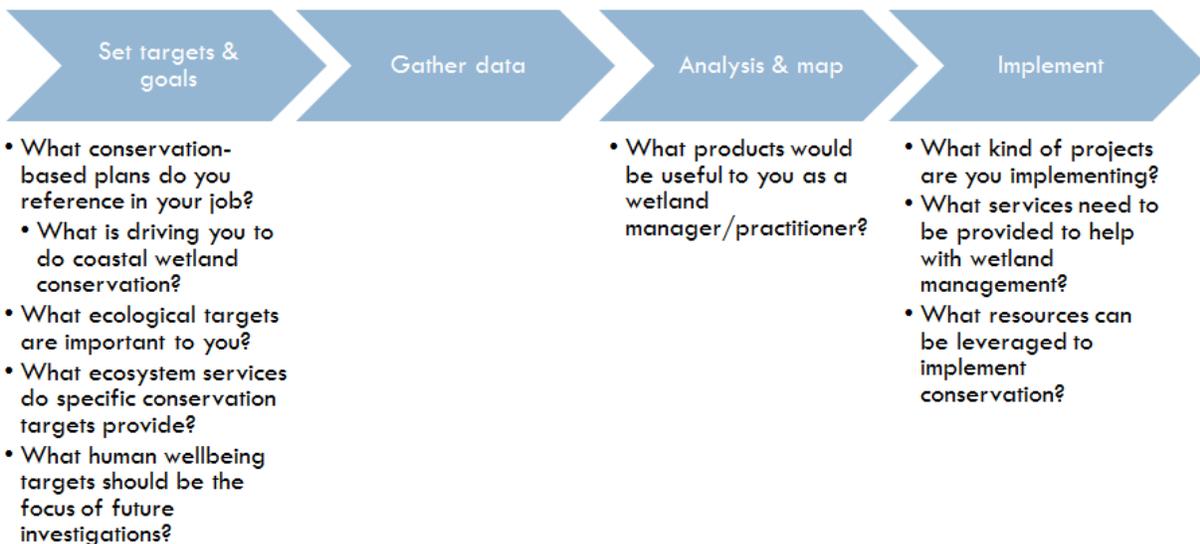


Figure 1. The 4 basic elements of the Landscape Conservation Design process and questions asked of workshop participants.

## Set Targets & Goals

### Plans and Drivers

Small breakout groups had conversations where participants were asked “What conservation plans do you reference in your job?”, and “What is driving you to do coastal wetland

conservation?” Understanding the conservation plans and other drivers used by conservation practitioners helps to identify the current state of conservation priorities and the values that agencies, programs, and individuals use to guide their actions.

## Results

Approximately 30 conservation plans were identified (Table 1). The geographic scope of these plans ranged from greater than the Great Lakes basin (e.g., North American Waterfowl Management Plan) to very site specific (e.g., Refuge Comprehensive Management Plan). Many of the plans were developed with and are intended for multiple partners. Lastly, most plans were oriented toward the conservation of fish and wildlife populations, biodiversity, or water quality.

Table 1. Conservation plans identified by workshop participants when asked what conservation plans they reference in their jobs.

Plan name	Geographic scope <sup>1</sup>	Jurisdictional scope <sup>2</sup>	Major Target Categories <sup>3</sup>	Link
Saginaw Bay Wetland Prioritization	Regional	Multiple	wetlands	
Coastal Estuarine and Land Conservation Plan	State	State	high quality, sensitive coastal areas; rare species/communities; biodiversity;cultural heritage; recreation	<a href="https://www.michigan.gov/documents/deq/deq-ess-clm-DraftCELCP-May07_211204_7.pdf">https://www.michigan.gov/documents/deq/deq-ess-clm-DraftCELCP-May07_211204_7.pdf</a>
Great Lakes Restoration Initiative Action Plan II	Basin-wide	Multiple	toxins/AOCs; invasive species; wetlands/habitat; eutrophication/nearshore health	<a href="http://greatlakesrestoration.us/actionplan/index.html">http://greatlakesrestoration.us/actionplan/index.html</a>
Saginaw Bay Watershed Initiative Network (WIN)	Regional	Multiple	eutrophication; wildlife; water quality;sustainable landuse	<a href="http://www.conservationfund.org/projects/saginaw-bay-watershed-initiative-network">http://www.conservationfund.org/projects/saginaw-bay-watershed-initiative-network</a>
Great Lakes Water Quality Agreement - Lakewide Action and Management Plans	Basin-wide	Multiple	nutrient loading; biological enhancing landuse; sustainable resource use; chemical/biological contaminants; invasive species	<a href="https://www.epa.gov/greatlakes/lakewide-action-and-management-plans">https://www.epa.gov/greatlakes/lakewide-action-and-management-plans</a>
Great Lakes Water Quality Agreement - Nearshore Framework	Basin-wide	Multiple	invasive species; recreation water quality; eutrophication; toxins/contamination	
Great Lakes Water Quality Agreement - Lake Ecosystem Objectives	Basin-wide	Multiple	eutrophication	<a href="http://www.ec.gc.ca/grandslacs-greatlakes/default.asp?lang=En&amp;n=A1C62826&amp;offset=5&amp;toc=show#A2">http://www.ec.gc.ca/grandslacs-greatlakes/default.asp?lang=En&amp;n=A1C62826&amp;offset=5&amp;toc=show#A2</a>
Upper Mississippi River and Great Lakes Region Joint Venture Implementation Plan	Basin-wide+	Multiple	native coastal wildlife	<a href="http://www.uppermississgreatlakesjv.org/Plans.htm">http://www.uppermississgreatlakesjv.org/Plans.htm</a>
Michigan Department of Environmental Quality 309 Strategy	State	State	wetlands; coastal hazards; Great Lakes	<a href="https://www.michigan.gov/documents/deq/deq-ogf-">https://www.michigan.gov/documents/deq/deq-ogf-</a>

			resources; public access; marine debris; impacts of development on coasts; siting	<a href="#">FINAL Draft MCZMP Section 309 Assessment Strategy 2016-2020 w appendices 491653 7.pdf</a>
Michigan State Wildlife Action Plan	State	Multiple	wildlife	<a href="http://www.michigan.gov/dnr/0,1607,7-153-10370_30909---,00.html">http://www.michigan.gov/dnr/0,1607,7-153-10370_30909---,00.html</a>
Federal Endangered Species Recovery Plans	Basin-wide+	Multiple	wildlife	<a href="http://www.fws.gov/endangered/species/recovery-plans.html">http://www.fws.gov/endangered/species/recovery-plans.html</a>
Saginaw Bay Area of Concern Restoration Plan	Regional		habitat; water quality; fish passage	<a href="http://psbw.org/home/resources/">http://psbw.org/home/resources/</a>
State Aquatic Invasive Species Plans	State	State	invasive species	<a href="http://www.michigan.gov/invasives/0,5664,7-324-68001---,00.html">http://www.michigan.gov/invasives/0,5664,7-324-68001---,00.html</a>
Refuge Comprehensive Management Plan	Local	Single	wildlife	<a href="http://www.fws.gov/midwest/planning/completedplans.html">http://www.fws.gov/midwest/planning/completedplans.html</a>
Lake Huron Biodiversity Conservation Strategy	Regional	Multiple	biodiversity	<a href="http://lakehuron.ca/uploads/pdf/Lake-Huron-Biodiversity-Strategy-2010.pdf">http://lakehuron.ca/uploads/pdf/Lake-Huron-Biodiversity-Strategy-2010.pdf</a>
Conservation District Plans	Local	County	natural resource conservation	<a href="http://macd.org/local-districts.html">http://macd.org/local-districts.html</a>
North American Waterfowl Management Plan and Updates	Basin-wide+	Multiple	waterfowl habitat	<a href="http://nawmprevision.org/">http://nawmprevision.org/</a>
Michigan Department of Natural Resources Master Plans	Local	State	natural and cultural resources	<a href="http://search.michigan.gov/search/docs?affiliate=mi-dnr&amp;dc=407&amp;page=1&amp;query=master+plans">http://search.michigan.gov/search/docs?affiliate=mi-dnr&amp;dc=407&amp;page=1&amp;query=master+plans</a>
Michigan Department of Natural Resources Habitat Management Plans				
Binational Biodiversity Conservation Strategy	Basin-wide+	Multiple	biodiversity	<a href="http://binational.net/2015/02/23/biodiversity-strategies/">http://binational.net/2015/02/23/biodiversity-strategies/</a>
Michigan Coastal Zone Management Program Plan	State	Multiple	Public access; water quality; habitat; hazards; sustainable development	<a href="http://www.michigan.gov/deq/0,1607,7-135-3313_3677_3696---,00.html">http://www.michigan.gov/deq/0,1607,7-135-3313_3677_3696---,00.html</a>
The Nature Conservancy Ecoregional Plan for the Great Lakes Region	Regional	Multiple	habitat; wildlife	<a href="https://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Documents/Summdoc.PDF">https://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Documents/Summdoc.PDF</a>
National Audubon Society Important Bird	Basin-wide+	Multiple	wildlife	<a href="http://web4.audubon.org/bird/iba/">http://web4.audubon.org/bird/iba/</a>

Areas				
Coastal Access				
Saginaw Bay Cooperative for Invasive Species Management	Regional	Multiple	invasive species	<a href="http://www.michiganinvasives.org/saginawbaycisma/">http://www.michiganinvasives.org/saginawbaycisma/</a>
Great Lakes Phragmites Collaborative	Basin-wide+	Multiple	invasive species	<a href="http://greatlakesphragmites.net/about/what-is-the-glpc/">http://greatlakesphragmites.net/about/what-is-the-glpc/</a>
Michigan Invasive Species Coalition	State	Multiple	invasive species	<a href="http://www.michiganinvasives.org/">http://www.michiganinvasives.org/</a>
Wind Resources Plan for Michigan	State	Multiple	offshore renewable energy	<a href="http://www.michiganglowcouncil.org/">http://www.michiganglowcouncil.org/</a>
Michigan Public Land Management Strategy	State	State	outdoor recreation; sustainable development; natural and cultural resources protection	<a href="http://www.michigan.gov/documents/dnr/Draft_DNR_Public_Land_Management_Strategy-5-24-13_422381_7.pdf">http://www.michigan.gov/documents/dnr/Draft_DNR_Public_Land_Management_Strategy-5-24-13_422381_7.pdf</a>
Local Recreational Plans	Local		recreation	
Regional Recreation Plans	Regional		recreation	
County Land Use Plans	Local	County		see county websites

<sup>1</sup>Geographic scope represents the geographic extent of that the conservation plan covers (local = individual county/area; regional = multiple counties or watershed(s); State = Statewide; Basin-wide = Great Lakes basin; Basin-wide+ = Great Lakes basin and beyond).

<sup>2</sup>Jurisdictional scope represents if the plan was developed with and for individual or multiple jurisdictions.

<sup>3</sup>Major target categories represents the overall emphasis of the conservation plans.

Specific drivers included providing for both ecological functions and human well-being. Economics, cultural heritage and importance, flood control, statutory and legislative obligations are some examples mentioned by participants as drivers for doing coastal wetland conservation (Table 2).

Table 2. Responses from workshop participants to the question “what is driving you to do coastal wetland conservation?”

Declining populations of birds, fish, and wildlife	Providing good quality habitat for all wildlife species	Ecosystem services - flood control, water quality, groundwater recharge
Legislative (federal and state mandates)	Statutory obligations (NRDA, CIRCLA)	To restore hydrologic connectivity
Human health	Economic driver for development/economics, coastal areas are valuable	Economics from tourism, marketing, water trails
Economic benefits from recreation	Non-consumptive use - hiking, kayaking/canoeing	Aesthetics - support PURE Michigan - pretty
Community development	Maintaining heritage/cultural importance	Maintaining conservation ethics
Resiliency - the link between wet/dry ecosystem and local economies	Beaches - ID where wetlands are not	Rare species
Imperiled native communities	Unique geological features	Program mission
Monarchs, mallards, and mussels	Community input	Public perception of needs
Human needs and values - fresh drinkable water	Great Lakes environmental stressors	

## Conservation Targets

Prior to the workshop, two expert panels - one for ecological targets and one for human well-being, developed a draft list of possible conservation targets for the LCD.

## Ecological Targets

Participants were asked to review the draft lists of conservation targets and identify which ecological targets resonated with them and what components of ecological targets were missing.

## Results - Ecological Targets

Participants felt many of the draft ecologic targets seemed appropriate for the effort. Some questioned the role or link to coastal wetlands for several specific targets and/or indicators. Additionally, this conversation brought out challenges relating to scale issues, the ability to monitor and measure progress, and the appropriate number of targets for such an effort. A summary of the comments for each target category is in Appendix A.

## Human Well-being Targets

Participants were placed into 4 groups to review categories of human well-being and were asked “what services do the targets provide?” and “what do they mean to you?” They also identify the human well-being targets that should be further investigated with additional research via a dot voting exercise.

## Results - Human Well-being Targets

Targets of “human health”, “leisure and quality of life”, “safety and security”, and “living standards” were selected as the most important via dot voting across all groups at the workshop. Below summarizes what was discussed around these four targets:

1. Human health
  - a. Presence/absence of algal blooms
  - b. Water quality and use - swimmable and drinkable water
  - c. Presence/absence of E. coli
  - d. Balancing increasing wetlands with vectors of disease
  - e. Native pollination
  - f. Fish toxin levels
  - g. Dioxins in wildlife
  - h. Exercise - more activity, lower obesity rates
2. Leisure and quality of life
  - a. Recreational opportunity
    - i. Fishing
    - ii. Swimming/Beach access
    - iii. Water/Boat access
    - iv. Hunting
    - v. Birdwatching - birding trails
  - b. Connecting with nature
  - c. Quality of life is connected to safety and security
  - d. Opportunities for residents and visitors
  - e. Business deciding to locate nearby
  - f. Home and family
3. Safety and Security
  - a. Reducing coastal hazards
  - b. Floodwater retention/mitigation and flood reduction
  - c. Erosion control
  - d. Pollution filtration

- e. Natural hydrologic regimes
- f. Phragmites fire hazard
- 4. Living standards
  - a. Property values - especially values near areas infested with non-native plants
  - b. Taxes
  - c. Amount of tourism
  - d. Fishing industry
  - e. Wetland related tourism industry
  - f. Services - flood mitigation value
  - g. Access and recreational opportunities - birding trail
  - h. Economic impact of health fish and wildlife populations - improved aesthetics
  - i. Value of wetland existence
  - j. Housing value for 2nd homes

## Analysis and Map

### Useful Products

Participants were asked “what products they would find useful?” This question was not restricted to just data analysis or mapping, but also included other tools that participants would find useful as conservation practitioners to maintain momentum of the collaboration through communication and dissemination of information.

### Results

Most of the products identified were to manage existing and new information. Analysis products were mostly focused on ecosystem, human dimensions, and economic valuation of coastal wetland conservation. Lastly, a couple suggestions were made to more formalize the collaborative nature of this effort via a charter, mission statement and collaborative structure (Table 4).

Table 4. Responses from workshop participants when asked “what products would you find useful?”

Product	Type(s)
Centralized source where all coastal wetland information discussed can “live” - note: if web-based consider bandwidth issues	Information management, communication
Identify and display what and where coastal wetland conservation has occurred	Information management, communication
Identify and display what and where coastal	Information management, communication

wetland work is being proposed

Educational information on economic benefits of wetland conservation - e.g., water treatment, green infrastructure benefits

Communication, education

Implementation toolbox - information on funding sources and resources

Information management

Valuation of social/quality of life of wetland investments - assess current and potential investments

Analysis

Marketing plan to show value of wetland conservation

Communication, education

Investigations of geomorphology

Analysis

Natural capital valuation and comparisons to other land use values

Analysis

Running list of research needs, questions, and data gaps

Information management

Quantify and communication of ecosystem value

Analysis, communication

Predicted impacts of climate change on wetlands

Analysis

Compilation of existing human dimensions research

Information management, communication

Formal commitment to action

Collaboration development

Mission statement and charter - collective impact collaborative

Collaboration development

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## Implementation

In order to build upon existing work, it is important to understand the current coastal wetland activities, needed resources, and areas for potential collaboration. Three questions were asked of workshop participants: 1) what work are you doing in coastal wetlands?, 2) what services are needed?, and 3) what resources can be leveraged to implement conservation?

### Results – ongoing work in coastal wetlands

There are many agencies and partnerships engaged in wetland conservation in the Saginaw bay geography. Meeting participants revealed substantial effort behind several initiatives aimed

at positively impacting wetlands. These actions fell into six broad categories: Education & Outreach, Wetland Enhancement, Wetland Monitoring, Wetland Planning, Wetland Protection, Research, and Wetland Restoration (Table 5).

Education and outreach initiatives include the Michigan Department of Natural Resources Waterfowl Legacy Initiative, work by Michigan SEA Grant, and water tourism education and outreach by the Saginaw Bay Water trail. In addition, education and outreach are a substantial component of the Saginaw Bay Cooperative Invasive Species Management Area (CISMA) related to invasive Phragmites and European Frogbit.

Conservation partners are conducting a substantial amount of restoration, enhancement, and protection around Saginaw Bay. The Saginaw Bay CISMA is engaged in enhancement/protection via efforts to control invasive Phragmites and European Frogbit in the geography. Both the Michigan Department of Natural Resources (MDNR) and the Saginaw Bay Initiative are interested in protecting high-quality coastal wetlands in the Saginaw Bay geography. Specifically, MDNR is updating infrastructure on managed wetlands, and have acquired high quality wetlands (e.g. the Wigwam Bay Duck Club) as primary measures of wetland protection. Their Michigan's Wetland Wonders program is also aimed at protecting high-quality wetlands. Finally, a key component of the Saginaw Bay Initiative is the protection of America's largest contiguous freshwater coastal wetland system. Three distinct restoration projects were highlighted; the Natural Resource Damage Assessment's Tobico Marsh restoration at Shiawassee National Wildlife Refuge; Huron Pines Charity Island restoration; and the Saginaw Bay Watershed Initiative Network's Wigwam Bay restoration work by the Saginaw Bay Chippewa Indian Tribe.

A number of initiatives are in place to develop and/or inform planning efforts in this geography. Both the Michigan Coastal Zone Management Program and the Tip of the Mitt Watershed Council are involved in developing climate resiliency plans and adaptation strategies, respectively. The Tip of the Mitt Watershed Council is working on identifying and mapping high-value coastal wetlands. The Michigan Natural Features Inventory is identifying wetland priorities and a management/decision support tool for invasive species. Central Michigan University's coastal wetland decision support tool is in development and will serve as a resource for managers going forward. Finally, the Natural Resource Damage Assessment is developing an assessment of the Tittabawassee River.

Ultimately, this round-table revealed that substantial work across a variety of sectors is ongoing in the Saginaw Bay watershed. This work is highly varied, from site-specific restorations to regional climate adaption/resilience strategies. Given the diversity of actions and scope of conservation in geography, coupled with the array of high-quality coastal wetlands, efforts to coalesce this work and inform decision making going forward may prove valuable.

Table 5. A list of ongoing conservation actions described by workshop participants organized by action type.

Agency	Action	Action Type
Michigan Department of Natural Resources	Waterfowl Legacy Initiative	Education/Outreach
Michigan SEA Grant	Coastal Wetlands Education & Outreach	Education/Outreach
Saginaw Bay Water Trail	Wetland tourism promotion	Education/Outreach
Saginaw Bay CISMA	Coastal Invasive education, outreach, inventory, and control (Phragmites & Frogbit)	Enhancement
Central Michigan University	Wetland monitoring program	Monitoring
Michigan Natural Features Inventory	Vernal Pool Patrol	Monitoring
Central Michigan University	Coastal Wetland Decision Support Tool	Planning
Michigan Coastal Zone Management Program	Climate Resiliency Planning	Planning
Michigan Natural Features Inventory	Wetland Priorities/Management tool for invasive species	Planning
Natural Resource Damage Assessment	Tittabawassee River	Planning
Saginaw Bay Initiative	High value coastal wetland identification	Planning
Saginaw Bay Initiative	Coastal Wetland mapping	Planning
Tip of the Mitt Watershed Council	Coastal Climate Adaptation Strategy	Planning
Michigan Department of Natural Resources	Managed wetland infrastructure updates	Protection
Michigan Department of Natural Resources	High quality coastal wetland acquisition (Wigwam Bay Duck Club)	Protection
Michigan Department of Natural Resources	Michigan's Wetland Wonders	Protection
Saginaw Bay Initiative	Wetland Protection	Protection
Michigan SEA Grant	Wetland Related Tourism	Research
Michigan Technological University/University of Michigan	Defining Coastal Wetlands	Research
Saginaw Valley State University	Phragmites DNA Study	Research
USGS	Benefits & Changes in Diked Wetland Reconnection	Research
Huron Pines	Charity Island Restoration	Restoration
Natural Resource Damage Assessment	Shiawassee National Wildlife Refuge Tobico Marsh Restoration	Restoration
Saginaw Bay Watershed Initiative Network	Wigwam Bay Restoration	Restoration
Saginaw Chippewa Indian Tribe of Michigan	Wild Rice Restoration	Restoration

## Results – potentially useful and needed services

Responses ranged from assistance/improvement in the permitting process for coastal wetland implementation actions, monitoring and research on coastal wetland functions, communication, education and training tools, to additional capacity. See Table 6 for a comprehensive list of responses.

Table 6. Responses from workshop participants on the question “what services are needed?”

Funding for equipment, personnel, land acquisition, invasive species control	Invasive species control contractor - (contractor names available via the Phrag Collaborative)	Comprehensive invasive species management and strategy
Better hydrology information - LiDAR, bathymetric, river gauges, hydrologist, groundwater monitoring	Common monitoring agenda for functional assessments	Increase staff capacity - regional, local, focal area coordination
Science needs - particularly around 10% wetland goal (to what end? What is the sequence of science needed to address that question)	Public outreach for community engagement and recruiting volunteers	Technical assistance for managing and restoring wetlands (training opportunities to build capacity)
Single database for partner “bios” and capacity	Single database for project tracking	TSP-NRCS - how to leverage that capacity
Contractors that are experienced and trusted	Equipment sharing to reduce costs - e.g., agreements to buy, house, and maintain equipment across agencies	Central location for training opportunities (website)
Educating public about importance of wetlands (esp. economics)	Trusted, state certified general appraiser	Facilitating DEQ permit process (market the LCD with them)
Streamline or change the permit process so it is not a bottleneck	Sustainable funding mechanism	Connection with other groups beyond conservation - translate between biological and community development
Marketing/promotional help - quantify economic impact, recreational impact - packaged in a way for meaningful delivery	Species, IBI, or other biological information for sites to help prioritize actions	Collaboration - more voices/support for greater impact

## Results – resources available for leverage

A broad array of potential resources that could be leveraged were discussed. Each representative agency/organization/individual had expertise or resources for coastal wetland conservation that could contribute to collaborative efforts. The list of resources spanned from marketing, outreach, and advocacy, to funding, science, decision tools, and planning. The ability to understand what resources are available, with whom those resources sit, and how to get in contact with them, is critical to fostering collaborative actions. Therefore, over the next year we would like to compile and build a database populated with this information. If you would like the “raw” list of responses to this question please send a request to [bradly\\_potter@fws.gov](mailto:bradly_potter@fws.gov).

## Other Information Captured

### Who was missing?

Participants were asked “who and what agencies or organizations were missing from the conversation?”

Tribal reps - especially Chippewa	Chamber of Commerce	Tourism (municipal)
Mayor (or local government staff)	Realtors Association	Non-traditional audiences
Farm Bureau	Drain Commissioners	Township planners (and municipalities)
State and Federal legislative aides	Forest Service	AOC Coordinator
Saginaw Bay Planning	Saginaw Bay Coastal Initiative	Reef restoration
Recreational Fishing Reps	Michigan Natural Features Inventory	Saginaw Bay or Little Forks Land Conservancy
Saginaw Valley State University - Dave Rarkovitch	Great Lakes Bay Regional Alliance - Annie Rummel	Eastern Michigan Council of Governors
Saginaw Bay Water Trails	Local hunting groups - Shiawassee Friends	Planning and economic level office
Fish biologists, ecologist	Media person - local	Michigan United Conservation Clubs
Private foundations	Environmental Protection Agency - Great Lakes Restoration Initiative	U.S. Fish and Wildlife Service Representative to EPA GLRI

Natural Resource Conservation Service	Audubon Chapters	DOW Chemical Corp.
Large private landowners	Consumers Energy	Commercial fisherman
Charter boat association	Saginaw Bay Walleye Club	Saginaw Bay Birding Trail
Local DEQ staff	Prosperity region coordinators	Watershed groups
Michigan Department of Transportation	Road Commissions	Zoning Commissions

## Ways to stay informed?

Participants were asked how they would like to stay informed of progress:

- Email
- Website – a place for drafts, tool betas, etc...
- Listserver
- Other groups regular meetings or their newsletters, email lists (e.g. WIN)
  - For big roll outs
- Other social media
- IAGLR in Detroit 2017ish (although the meeting focuses more on the deep water portions of the lakes)
- Online collaborative platform
- Annual meeting for larger group
- Email distribution
- Twitter
- Biannual update webinar
- Field visit/celebration of success
- Regular contact (so not to fall off radar)

## What makes you nervous?

Participants were asked what makes them nervous about the future:

- What will climate change mean for pressures on land use and water use?
- Marsh Bird IBI scores
  - Are they truly representative of migratory bird use?
  - Temporal consideration
- What benefits and how much of each do coastal wetlands currently provide in Saginaw Bay?
- Invasive Species
- SO MANY PLANS!
  - How do we make sure we are addressing them all?
  - Where do they all live?!

- Can we get a list of attendees, organization and key responsibilities so we can continue conversations and build partnerships?
- Where does “enhancement” of wetlands fit in? Prioritization tools focus on “restoration”. There are a lot of good enhancement projects that need funding too!
- How long until the western US and the rest of the world put straws in our Great Lakes
- Phragmites control and spread is worrisome. What is the status of developing a biocontrol for Phragmites?
- I worry that lower river floodplain wetlands (influenced by lake levels and seiche) are not recognized/emphasized as coastal wetlands.
- In the contexts of human population growth and global climate change, is my work futile?
- Cell (mapping blocks) of invasive species
- State and federal current invasive management
- Knowledge for spatial data management
- Nayanqing Point particle input to Saginaw Bay
- Disconnect of children and nature: this is actually a multi-generational problem.
- Loss of political support/funding for conservation: “smaller government” and priorities for infrastructure defense etc, etc...
- Human population and desire for higher standard of living worldwide will tax all natural resources.
- How to keep everyone engaged so this doesn’t become another plan/tool on the shelf? Responsibility? Accountability?

Appendix 1. Summaries of comments on draft ecological targets for Great Lakes coastal wetlands, by workshop participant table.

Target	Comments by table
Biological Integrity	<p>Table 1 - Overall IBI's are a good idea and they are already being measured. Continue to use them.</p> <p>Table 2 - Amphibian and fish diversity and abundance should be added. Consider use of invertebrate IBI's.</p> <p>Table 3 - Overall, broad agreement emerged that indices of biological integrity are valuable in assessing coastal wetlands. Fish, plants, and birds are recognized as highly visible and incredibly important components of coastal wetlands. However, it was also recognized that all of these are tied to macroinvertebrates, and thus there was substantial agreement that the macroinvertebrate IBI is a critical indicator of biological integrity. Four concerns were raised with respect to the Biological Integrity targets. First, there was concern that amphibian abundance and diversity was not considered, particularly as amphibians are recognized as an environmental sentinel species. It is recommended that, if possible, an amphibian IBI be considered. Second, given that plants respond to previous condition, how will large invasions skew the results? For example, if Phragmites invades a wetland, will this negatively impact any wetland "rankings," even if the wetland scores high in other biological integrity indices? Third, understanding that wetlands do not exist in a vacuum, how will landscape stressors accounted for in the Landscape Conservation Design Framework in general, and into spatially-explicit targets? The final concern was looking forward to rolling out to the public. It was recognized that these indices are extremely useful to scientists, but we must be cognizant that they may not translate well to the lay public, thus underscoring the importance of a solid communications and outreach strategy.</p> <p>Table 4 - no comments.</p>
Plant Community Integrity	<p>Table 1 - The major invasive plants of concern are listed, but there is a lack of native plants. Bullrush is an important native plant to consider. A plant "community" approach, especially focused on the rare communities such as alvars, lakeplain prairie, and fens should be considered.</p> <p>Table 2 - Consider adding diversity of native plant species, wild rice might not be the best indicator (lakeplain prairie, Eastern Prairie Fringed Orchid, or other); Lump invasive species into two categories to capture those to track via Early Detection Rapid Response and those that maybe need to be tracked by % coverage or % native/non-native. Where do we capture vegetation structure (herbs, shrubs, trees) which may be more important than composition. Can we capture heterogozity of wetland structure somehow?</p>

Table 3 - Nearly every participant recognized that non-native Phragmites weighs heavily on their adaptive management and decision making process. As such, Phragmites drove much of the conversation. Specifically, the challenges associated with Phragmites, including that they're clonal, can be missed, and are impacted by water levels. Given the above, it was recommended that the assessment metric is the percentage of wetland coverage via 3-year rolling average. Alternatively, the rate of expansion (by size or area) was considered as an alternative, but only if there was solid justification, if the approach is realistic, and if a better definition of rate of expansion is developed (i.e., is this within the LCD geography, or to each specific wetland within the geography). The participants noted that they are often concerned with the next big invasive plant species. European Frogbit, Water Chestnut, and any new species listed as a state priority were recommended considerations. As a part of those recommendations, two key evaluation questions were posed:

1. Can we predict what the next big invasive species is?
2. When does an invasive species hit critical mass?

Native species were also considered in this discussion, and Pitcher's Thistle was recommended as a target, with prevention of extirpation of existing populations the goal. Participants indicated that solid data were available in Saginaw Bay on Pitcher's Thistle. Other recommendations were to consider both Soft Stem Bulrush as well as the Floristic Quality Index (FQI). Finally, the participants suggested being considerate of site-specific rare species, and water history and levels in considering native plants.

Table 4 - Plants are foundational making up the base of the food chain. Other species are sensitive or correlated to their presence. Should look toward identifying native plant diversity. Plants provide good indicators of wetland function, such as water quality and geomorphology. Plants provide a good indication of climate and land use. They should be seen as a 1st level target. Specific communities and species should be considered, such as lakeplain prairie and Eastern Prairie Fringed Orchid.

Table 1 - Lesser Scaup is a species that may not apply well. Suggested to be removed. Passerine birds that use the areas for stopover or breeding are missing, but no specific species could be identified. Nesting Osprey use coastal systems and maybe considered. Mink could be included as a mammal species using wetlands, but the link to coastal wetlands would need to be investigated. Spotted turtle or Blanding's turtle could be considered in some areas.

#### Native Coastal Wildlife

Table 2 - Instead of listing by species can we put into species guilds (shorebird, wading birds, waterfowl) or a combination of both species and species guilds. Should add to list some pollinators and fur-bearers. Bald Eagle, Osprey, Swans may be good umbrella species (healthy populations of these species result in healthy populations of many other species) check list to see if we have umbrella species included (if not, add them).

Table 3 - There was concern with respect to species detection and recognize that appropriate sampling is essential. An additional confounding factor they suggested to consider is the impact of national trends on local abundance. They recommended considering native coastal wildlife in the context of acres of each habitat/wetland type in the LCD geography, weighting abundance by national trends, and capturing changes yielded by climate change. In addition to these concerns, it was suggested a number of species including secretive marsh birds, Bald Eagles, Great Blue Heron, Spotted Turtles, Softshell Turtles, Fox, Mink, Otters, Piping Plover, Muskrat, and Hines Emerald Dragonflies should be considered. Panelists recommended reviewing State Wildlife Action Plans for additional species. Finally, with respect to recreation, it was suggested that Mallard and Wood Duck feature prominently in this target category.

Table 4 - Native wildlife are important to many stakeholders. Some of the rare coastal species are desired but can be expensive to measure (like King Rail). Sampling for surrogates may be necessary. Current list appears to cover many habitat types, but provides little focus. Missing a lakeplain prairie associated species as an indicator.

Table 1 - Many of the fish species are pretty rare and would represent reference condition wetlands. Species like blackchin shiner, blacknose shiner, pugnose minnow, pugnose shiner, banded killifish, and spotted gar (only found in one location) represent the highest quality wetlands, but their presence is difficult to attain. Coastal wetlands with presence of species like emerald shiner, largemouth bass, Great Lakes muskellunge, and northern pike would represent wetlands in good condition. Mooneye should be removed from the list.

#### Native Wetland Fish

Table 2 - Fish species community assemblages more meaningful than individual fish species.

Table 3 - A number of considerations were provided in the round-table discussion of Native Wetland Fish targets. First, it was identified that Mooneye do not use wetlands in the Saginaw Bay area and should be removed. In addition, the panelists recommended considering Spotted and Longnose Gar. Centrarchids (e.g. Largemouth and Smallmouth Bass, Red-eared Sunfish, Blue Gill, and Pumpkinseed) were recommended for prominent inclusion, as they represent recreationally and economically important species. With respect to metrics, baseline estimates, sampling, and monitoring was identified as a key consideration. Specifically, who measures the indicator and how was emphasized as an important component. Creel surveys, satisfaction surveys, catch per unit effort, and temporal monitoring were all identified as possible options for setting population baselines and subsequent monitoring. Finally, the issue of invasive fish species was raised, with specific emphasis on Common Carp, Red Crayfish, and New Zealand Mud Snails.

Table 4 - Native wetland fish are important to many stakeholders. Need to investigate if there is evidence of sturgeon or walleye being connected to coastal wetlands. Coastal wetlands provide a nursery area for a variety of juvenile fish. Consider measuring abundance and not just species presence or diversity. Bass are not migratory in the same sense as other fish. Emerald shiner should be considered migratory. We lack data on many coastal wetland fish species. Several challenges were raised: 1) how do we set appropriate indicators/targets for realistic site conditions, 2) issues of scale, and 3) targets that are missing that make sense. Discussed if goals should be set first and then indicators. A question was raised that if we hit many different goals do we artificially reduce diversity at conserved sites? We should explore the value of setting a shared narrow focus, rather than a shared portfolio.

#### Native Migratory Fish

Table 1 - Lake sturgeon use of coastal wetlands is unknown. Coastal wetlands may have been important historically for young of year sturgeon at major river mouths. Walleye do not relate enough to wetlands. Perch use wetlands for spawn and nursery habitat and would be a good indicator. Article by Jude and Tesser (1981) would provide a good reference to identify Great Lakes migratory fish.

Table 2 - Pike should be added. Muskie should be moved to migratory fish. Consider lumping native migratory fish and native fish categories

Table 3 - Once again, monitoring became an important topic of discussion, given the temporal nature of usage by migratory fish. Specifically, as they are often using these wetland habitats as spawning and nursery areas, the time of year for sampling is a critical consideration, and thus clarifying the timing of sampling will be integral to accurate assessment of these targets. Further, given the above, the panelists wondered how we could measure viability if they are only using these wetlands for a part of their life span? It was recommended that verified recruitment from the wetlands being used be the metric to use herein. Finally, the panelists recommended considering the Banded Killifish in this category.

Table 4 - Lumped fish conversation together with native wetland fish.

#### Shoreline Activity

Table 1 - Soil erosion is a concern and could be considered an indicator. Linked to water quality, storm water management, and volume. Need to consider how this relates to the restoration of natural hydrological regime.

Table 2 - No comments

Table 3 - The panelists were in agreement that these targets are sufficient.

Table 4 - no comments.

#### Water Quality

Table 1 - no comments.

Table 2 - no comments

Hydrologic Regime

Table 3 - The panelists here were in support of these targets, but were concerned with how it is being measured, and if source (agriculture versus runoff) could be considered. In addition, it was recommended that turbidity be considered as a water quality indicator.

Table 4 - no comments.

Table 1 - no comments.

Table 2 - no comments. But see comments under connectivity as it relates to hydrologic regime and connectivity due to lake level changes or seasonal water fluctuations.

Table 3 - The connectivity of coastal wetlands and the Great Lakes was a substantial topic of consideration in this target. Specifically, the water level fluctuation in coastal wetlands is intimately tied to Lake Huron (in the Saginaw Bay geography). Thus residence time may be an important indicator, but is very difficult to quantify.

Table 4 - Should consider broader than hydrologic regime and consider physical integrity (e.g., geomorphology).

Community and ecosystem connectivity

Table 1 - If used, the indicator of distance to nearest Wildlife Refuge should be expanded to include other protected public lands. This category could better explore the open water-upland connection that wetlands provide. Restored versus historical wetlands often function differently and may need to be considered differently within this category.

Table 2 - Distance to nearest Wildlife Refuge needs to be revised to include any conserved lands (not just refuge lands). This category should include the timing of connectivity (it could be that some wetlands are connected during certain periods within the year or over decades while other times it is not connected).

Table 3 - The greater context was a key consideration in the discussion of community and ecosystem connectivity. The distance to any conserved land (state, federal, NGO, trust, tribal, etc.) was recommended as a potential indicator for which data are likely available. In addition, wetland size and wetland complex size were recommended as useful indicators to consider. They panelists suggested consideration within wetland connectivity, which could be considered from a variety of metrics, including vegetation, hypoxic zones, and other barriers that effectively segregate a contiguous wetland. The presence of barriers, thresholds to connectivity and the adjacent landscape context were also suggested as considerations. Finally, it was recommended that vulnerability/adaptability to climate change be considered.

Table 4 - Is community equal to habitat? The language around the distance to nearest Wildlife Refuge should be revised to include other protected lands. Connectivity is species specific and not meaningful at the community scale. All indicators should be under one KEA except the last two. These targets are dependent on the specific goals that are trying to be reached.

Other comments

Table 1 - May want to include an additional category of aerial migrants (e.g., birds, insects, and bats).

Table 2 - How does this LCD fit with USFWS LCD process or for their purposes

Table 3 - none.

Table 4 - (From native fish comments, but apply here) Several challenges were raised: 1) how do we set appropriate indicators/targets for realistic site conditions, 2) issues of scale, and 3) targets that are missing that make sense. Discussed if goals should be set first and then indicators. A question was raised that if we hit many different goals do we artificially reduce diversity at conserved sites? We should explore the value of setting a shared narrow focus, rather than a shared portfolio.

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