

Bridging the Implementation Gap: Designing a Course of Action with Michigan Public Advisory Councils

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ACRONYMS LIST

AOC	Area of Concern
ARC	Alliance of Rouge Communities
BPAC	Binational Public Advisory Council (St. Clair)
BUI	Beneficial Use Impairment
CAC	Citizen Advisory Committee (Lower Menominee)
COTE	Commission on Environment and Water Quality (Raisin)
CRWC	Clinton River Watershed Council
DEI	Diversity, Equity, and Inclusion
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	Environmental Protection Agency
FDR	Friends of the Detroit River
FOSCR	Friends of the St. Clair River
FOTR	Friends of the Rouge
GLRI	Great Lakes Restoration Initiative
GLWQA	Great Lakes Water Quality Agreement
KRWC	Kalamazoo River Watershed Council
MDNR	Michigan Department of Natural Resources
MLWP	Muskegon Lake Watershed Partnership
PAC	Public Advisory Council
PSBW	Partnership for the Saginaw Bay Watershed
RAP	Remedial Action Plan
RRAC	Rouge River Advisory Council
SEAS	University of Michigan, School for Environment and Sustainability
SPAC	Statewide Public Advisory Council

TLPAC	Torch Lake Public Action Council
WMSRDC	West Michigan Shoreline Regional Development Commission

EXECUTIVE SUMMARY

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) enlisted the help of three past master's capstones through the University of Michigan, School for Environment and Sustainability between 2019 and 2020 to research how Michigan Public Advisory Councils (PAC) can maximize their effectiveness and stewardship impact within the Michigan Areas of Concern (AOC) program.

While these recommendations are valuable, it is challenging to turn research into usable solutions for decision-makers and practitioners. Unique PAC attributes create advantages and challenges when working to implement beneficial organizational changes. To address this implementation gap, we worked alongside the PACs and EGLE to translate these recommendations into implementation plans. We synthesized the 24 cumulative recommendations from the previous three capstones into a shortlist of eight, which we used throughout the interview process. We divided this process into individual Phase I interviews and PAC-wide Phase II community conversations to identify the priority objectives for 10 Michigan PACs and outline how to implement them. Using this information, we created an implementation plan for each PAC that documented organizational structures and action items to achieve within the next five years.

We conducted a formal qualitative analysis for our Phase I interviews with PAC members, consisting of two parts: hand-coding and auto-coding. We created a codebook to hand-code each interview transcript to confirm the priority objectives of each PAC; we then used the auto-coding program to provide an unbiased perspective of each transcript. We coded each PAC individually and all together as a state-wide analysis. These codes showed that while PAC members varied in their interview responses, a majority of PACs expressed their interest in implementing recommendations related to community education, life after delisting, and PAC recruitment. We also found that PAC members felt they had made the most progress toward recommendations related to PAC structure, community education, and partner organizations.

Finally, we developed four recommendations for the AOC program given our work over the last year and a half that we feel will strengthen PACs' organization structures, capacity and, durability: (1) include underrepresented communities; (2) build external funding sources; (3) assist PACs in preparing for stewardship after delisting; and (4) design collaborative state PAC meetings.

INTRODUCTION

Background on the AOC Program

The Laurentian Great Lakes are the most extensive freshwater system in the world and the backbone for the region's economy and society. Economically, this abundant freshwater resource provides a competitive advantage for manufacturing, shipping, and tourism industries. Socially, the Great Lakes has shaped the histories and cultures of coastal and nearby inland communities. People from around the world visit the Great Lakes to boat and fish on the open waters, hike the trail systems, and relax on the banks and beaches. This region is also the ancestral homeland of many indigenous communities, and the Great Lakes ecosystem is essential for the well-being, heritage, and identity of local indigenous peoples.

Given the valuable services provided by this freshwater ecosystem, industries such as mining and manufacturing of steel, cars, chemicals, and paper were prevalent throughout the mid-1900s (Clark, 2018). Factories such as the Ford Motor Sterling Axle Plant, Chrysler, Volkswagen, and the General Motors Pontiac Motor Division all sat along tributaries that flow into the St. Clair-Detroit connecting water systems and eventually Lake Erie (MDNR, 1988). Heavy metals introduced into the water systems by industries created unsafe waterways that left residents unable to drink or recreate in the water. In 1969, the Washington Post stated that Bethlehem Steel “used Lake Erie as a handy giant sewer, discharging uncounted tons of wastes into its waters with scarcely a second thought” for decades (Carter, 1969). The Post continued, “once-clean beaches have been closed to the public. Fish have died by the millions. Heavy silting has vastly accelerated the natural gradual filling of the shallow lake's floor” (Carter, 1969). This intensive pollution and ecological contamination were characteristic throughout the Great Lakes region in the early and mid 20th century. The booming industrial hubs ultimately became centers for large-scale degradation within Great Lakes coastal waters.

In response to this large-scale pollution and associated degradation, representatives of both countries bordering the Great Lakes, Canada and the United States, developed the Great Lakes Water Quality Agreement (GLWQA) of 1972 to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin (IJC, 1987). In 1987, the two countries amended the GLWQA, creating the Areas of Concern (AOC) program to restore the most polluted aquatic locations in the Great Lakes. There are 14 defined Beneficial Use Impairments (BUI) in the AOC program, each representing a dimension of significant environmental degradation (EPA, 2019). These include major environmental issues such as loss of fish and wildlife habitat, contaminated sediments, eutrophication or undesirable algae, beach closings, and restrictions on drinking water consumption (EPA, 2019). AOCs are defined by

having at least one BUI; the AOC program aims to remove all BUIs identified for each area, which then ceases to be an AOC once all its BUIs are removed (EPA, 2019).

In 2010, the United States instituted the Great Lakes Restoration Initiative (GLRI), which has provided extensive funding to the AOC program. The goal of the GLRI is to provide funding for protection and restoration efforts on the five Great Lakes. The funding provided to the AOC program has dramatically accelerated the clean-up of AOCs and removal of BUIs (The Great Lakes Interagency Task Force and the Regional Working Group, 2019). Currently, the GLRI provides the AOC program with approximately \$100 million annually (White House Council on Environmental Quality et al., 2010). Many of the BUIs removed thus far were simpler and cheaper to remediate; sediment remediation is one of the main environmental problems left because sediment removal is a complicated and expensive process. Since the work ahead will be difficult, it is essential that the AOC program functions at a high level.

The Critical Role of Local PACs

There were 14 AOCs identified within Michigan (Figure 1), three of which are now delisted. Each AOC has an associated Public Advisory Council (PAC), responsible for advising the state and consulting the public about AOC-related work. PACs were created in the late 1980s and the early 1990s. When establishing the PACs, Michigan sought strong representation from broad stakeholders by hosting public meetings at many AOC locations to inform the public about the creation of advisory councils. The state solicited applications for PAC members, and there was a strong response from the public. Initial PAC members were selected by gubernatorial appointment; after reviewing applications, the governor formally invited individuals to sit on the councils. At first, PACs were tightly run by the Michigan Department of Natural Resources (MDNR) which ran PAC meetings, wrote agendas, and primarily structured the PACs.

During the early 1990s, the states and the Environmental Protection Agency (EPA) disputed long-term funding for the AOC program. The EPA felt the states should take over the program long-term and eventually fully fund it themselves. Conversely, states thought it was the federal government's duty to continue providing support as the AOC program was initiated by a federal government commitment between the United States and Canada. Slowly, Michigan began reducing its commitment and resources for the AOC program. With fewer resources and staffing, Michigan could not offer the same level of oversight and direction to PACs as they had initially. The state looked to PACs to take a much more significant and active role in running their operations. From this point on, PACs became more autonomous and held more significant responsibilities.

At present, PACs work with the Michigan Department of Environment, Great Lakes and Energy (EGLE), EPA, and other agencies and local partners to advise the required work and projects needed to remove all BUIs in each AOC. Once the tasks are agreed upon, the work is funded and

completed. Any chosen organization or agency can complete these projects. When a BUI is ready for removal, EGLE writes a BUI removal report and proposes it to the PAC. The PAC supports the removal of the BUI, and the report is sent to the EPA for official removal.

While PACs do not have any formal legal authority and are largely composed of volunteer citizens, they are foundational to the AOC program. PACs were created to provide the local public with a voice in the BUI removal process. PACs are responsible for building communication between AOC stakeholders, including governmental agencies, educational institutions, environmental organizations, indigenous communities, and local community members. PACs are expected to communicate AOC-related issues to the public and hold meetings and discussions to hear the broader communities' interests and concerns. PACs are also encouraged to network and build support for the AOC program by identifying and recruiting key stakeholders and building relationships with political leaders to support BUI removal goals. Further, PACs are responsible for advocating for specific restoration activities and facilitating public involvement with clean-up efforts.

Beyond directly working within the AOC and its surrounding community, PACs also participate in the Statewide Public Advisory Council (SPAC). The Michigan SPAC was established in 1991 as a coalition of representatives from the PACs. The SPAC was designed to advise EGLE on AOC program priorities and provide EGLE with input on effective public participation strategies. SPAC meetings also serve as a forum for EGLE to share information about the AOC program, current funding opportunities, and restoration techniques with PAC members. Broadly, SPAC meetings are an avenue for EGLE to work with PACs on organizational and administrative issues and help PACs operate successfully.

To further support PACs, EGLE designates a State of Michigan AOC coordinator to work with each PAC. This individual coordinates restoration efforts among federal, state, and local partners and serves as the recognized resource expert and technical advisor for their PACs. AOC coordinators help facilitate the implementation of Remedial Action Plans (RAPs), which identify the BUIs present at AOCs, outline how BUIs will be removed, and define other projects that lead to BUI removal.

Previous AOC Master's Student Capstones

Given the importance of the AOC program, PACs must function effectively and efficiently. PACs are groups of volunteer citizens that have a spectrum of knowledge and experience. PACs may: struggle to connect with the larger community, lack engagement and commitment from local government partners, forego documenting clear roles and responsibilities, have unclear organizational structures, and require additional support to optimally facilitate BUI removal (Vogelsohn Zejnati, 2019). To better understand how PACs can improve and strengthen their stewardship role in the AOC program, three previous master's capstones—consisting of one

thesis and two projects—from the University of Michigan School for Environment and Sustainability (SEAS) (together with EGLE and individual Michigan PACs) researched, respectively: (1) what attributes of PACs make them most effective (Vogelsong Zejnati, 2019); (2) how PACs should prepare for long-term stewardship after AOC delisting (Knauss et al., 2019); and (3) how EGLE can support PACs that are a long way from delisting (Madden et al., 2020).

Each capstone provided the AOC program with recommendations on how to create more effective PACs that improve the BUI removal process. The first capstone was a thesis that explored factors that enable and constrain Michigan PACs' abilities to influence RAP implementation progress (Vogelsong Zejnati, 2019). Constraining factors included: poorly managed meetings, wavering commitment from community members and organizations, and inconsistent state and federal engagement. Voglesong Zejnati (2019) provided nine recommendations, including: supporting the PAC's membership balance and strategic recruitment, engaging in strategic planning for outreach, and navigating expectations of and fluctuations in funding. Collectively, these recommendations describe how the AOC program could best cultivate a community-based and collaborative ecosystem-management approach to removing BUIs.

The second capstone was a project that identified how the Michigan AOC program could best prepare communities for long-term success after AOC delisting (Knauss et al., 2019). Knauss et al. (2019) provided nine recommendations to the AOC program, including creating communication strategies to change negative public perceptions of the water bodies, increasing EGLE staff presence at PAC meetings, and developing a delisting structure and planning process.

The third capstone was a project that researched the challenges of community engagement and participation in the most complex Michigan AOCs that have a long way to go before delisting from the program (Madden et al., 2020). This project provided six recommendations to the AOC program, emphasizing the need to: educate local communities on the AOC program, create working relationships between PACs and partner organizations, and broaden community representation within PACs.

Collaborating with PACs to Strengthen Organizational Capacity

While valuable, the 24 recommendations made by the previous three SEAS capstones are challenging to turn into action because implementation is an abstract process. The AOC program focuses on the project and engineering aspects of removing BUIs, resulting in minimal investments in crucial elements of PAC form and function, including: organizational structure, resource capacity, and relationships with surrounding institutions. This greater level of investment in administrative processes is required to maximize project outcomes and community

impacts. EGLE acknowledges the need to go beyond what the AOC program requires and hopes to provide further organizational support for Michigan's PACs.

Each PAC is unique, with a specific geography, history, organizational structure, and capacity; these attributes create a range of hurdles for acting on recommendations. For example, some PACs have vital strengths, such as dedicated PAC members with a long history with their AOC, strong relationships with their AOC coordinator, and an extensive partnership network with their surrounding community. However, even these PACs face challenges borne out of a lack of support for, and attention to, organizational development. These challenges include limited new PAC member recruitment, lack of PAC member diversity (i.e., women, people of color, and young people), and loss of PAC members due to retirement or their jobs that require more of their time and capacity. Other PACs have a less established foundation; they struggle with a complex relationship with the Michigan AOC program, dwindling numbers of PAC members, a lack of new member recruitment, inadequate partnerships, and a limited sense of purpose beyond BUI removal.

Therefore, our team's goal was to work alongside the PACs and EGLE to translate previous SEAS master's capstone recommendations into concrete implementation plans. We set out to catalyze an increased level of attention and investment into PAC organizational structure and capacity.

To begin translating the previous capstone groups' recommendations into action, we synthesized and reduced the 24 recommendations into a shortlist of eight that we proposed to the PACs. Once we determined which recommendations each PAC was interested in, these recommendations became the PACs' priority objectives. Our project objectives were:

1. To determine which specific recommendations each PAC was interested in and their capacity to achieve their desired objectives.
 - a. To address this, we (1) interviewed PAC members individually and discussed which recommendations individual members found to be essential for their PAC, and (2) then met with PACs as a group and their AOC coordinator to discuss how they specifically planned to implement their objectives.
2. To collaborate with 10 Michigan PACs to create individualized organizational implementation plans that document what members collectively stated as important to them and the strategies they outlined as potential paths forward.
 - a. To address this, we (1) documented their selected objectives and action items, (2) provided them with one- to two-year and three- to five-year organizational structures and action items to achieve, and (3) included our recommendations beyond what PAC members stated.
3. To provide recommendations to EGLE and the PACs that we feel will strengthen PACs' organizational structure, capacity, and durability.

METHODS

Study Areas and PAC Descriptions

East Michigan PACs -- For our report, we classified the Clinton River PAC, the St. Clair River Binational PAC (BPAC), and the Partnership for the Saginaw Bay Watershed (PSBW) as “East Michigan PACs.” The Clinton River AOC encompasses the entire Clinton River watershed which includes: the Clinton River and its tributaries; the Spillway, a two-mile-long canal that connects the Clinton River to Lake St. Clair; and the nearshore area of Lake St. Clair. The St. Clair River AOC spans the 40 miles of the St. Clair River, which connects Lake Huron and Lake St. Clair, and the St. Clair delta/flats. The Saginaw River and Bay AOC encompasses all of the Saginaw River, both the Shiawassee and Tittabawassee Rivers upstream, and the entire stretch of the Saginaw Bay to the opening of Lake Huron between Au Sable Point and Point Aux Barques.

Each of these PACs have a unique organizational structure. The Clinton River PAC is nested under the Clinton River Watershed Council (CRWC), a nonprofit working on water quality and land use issues in the Clinton River watershed. The CRWC strives to protect, enhance and celebrate the Clinton River, its watershed, and Lake St. Clair. The St. Clair River BPAC represents a binational AOC, so it has members from both Ontario and Michigan. In Michigan, the Friends of the St. Clair River (FOSCR), a nonprofit focused on inspiring citizen action through stewardship, monitoring, and education to restore, protect and enhance the St. Clair River and its watersheds, plays a significant role in the BPAC. The FOSCR will eventually continue the BPAC’s stewardship work once the AOC is delisted and the BPAC no longer formally exists. The PSBW was formed to serve the entire Saginaw River and Bay watershed and functions to restore beneficial uses to the watershed.

Southeast Michigan PACs -- We classified the Detroit River PAC, Rouge River Advisory Council (RRAC), and the River Raisin PAC as “Southeast Michigan PACs.” The Detroit River AOC includes all 32 miles of the Detroit River that connects Lake St. Clair to Lake Erie. The Rouge River AOC consists of the entire Rouge River watershed, which houses 48 communities in southeastern Michigan, including much of the Detroit metropolitan area. The River Raisin AOC comprises the lower portion of the River Raisin and extends one-half mile into Lake Erie.

The Detroit River PAC stands alone and works with a network of partners, including the Friends of the Detroit River (FDR). The FDR, a nonprofit working to protect the Detroit River, has long been a leading contributor and supporter of the PAC. While the Detroit River AOC is binational, the Detroit River PAC is not a BPAC; however, the PAC works closely with its Canadian counterpart, the Detroit River Canadian Cleanup. The RRAC works closely with the Alliance of

Rouge Communities (ARC), an organization which encourages watershed-wide cooperation and support to restore beneficial uses of the Rouge River for local residents while meeting water quality permit requirements. The Friends of the Rouge (FOTR), a nonprofit organization focused on community education and raising awareness about the need to clean up the Rouge River, also contributes to the RRAC's stewardship work. Finally, the River Raisin PAC is housed within the Commission on Environment and Water Quality (COTE), which makes recommendations directly to the City Council and the City Manager about land and water resources within the City of Monroe.

West Michigan PACs -- We classified the Kalamazoo River Watershed Council (KRWC) and the Muskegon Lake Watershed Partnership (MLWP) as "West Michigan PACs." The Kalamazoo River AOC is located in southwestern Michigan and includes the lower portion of the Kalamazoo River watershed from Morrow Dam in Kalamazoo County to the river's mouth in Allegan County. This watershed drains over 2,000 square miles of land in southwest Michigan and is one of the largest AOCs. The Muskegon Lake AOC is located in Muskegon County and includes Muskegon Lake, Ruddiman Creek, Ryerson Creek, Four Mile Creek, Green Creek, Bear Lake, and Little Bear Creek, and the north and south branches of the Muskegon River; it is also connected to Lake Michigan by a navigation channel.

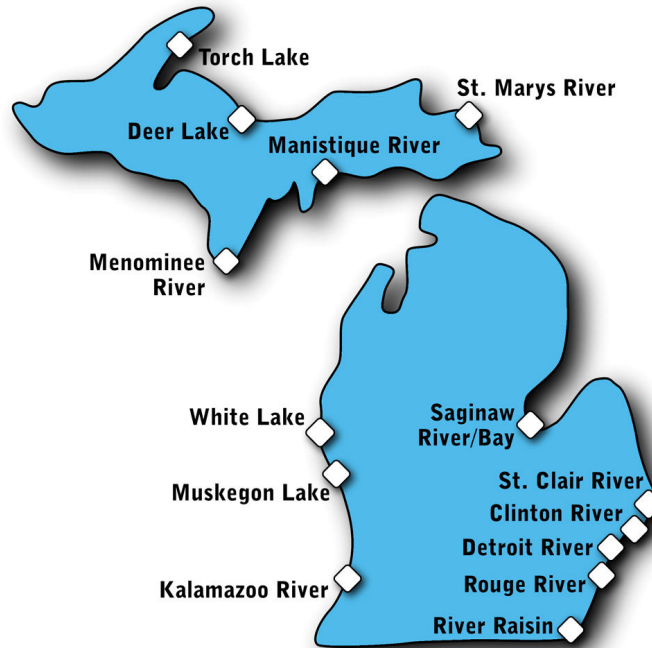
The KRWC focuses on restoring beneficial uses and working with the Superfund and Natural Resource Damages programs to cooperatively restore the Kalamazoo River watershed. The MLWP is a 501(c)(3) nonprofit volunteer organization which has a fiduciary partner, the West Michigan Shoreline Regional Development Commission (WMSRDC), that maintains an account for MLWP's tax-deductible, charitable contributions.

Upper Peninsula PACs -- We classified the Lower Menominee River Citizens Advisory Council (CAC) and the Torch Lake Public Action Council (TLPAC) as "Upper Peninsula PACs." The Lower Menominee River AOC includes the lower three miles of the Menominee River and extends approximately three miles north of the river mouth to John Henes Park and approximately three miles south of the river mouth past Seagull Bar along the Bay of Green Bay. The Menominee River is in the western Upper Peninsula and flows into Green Bay; the river also forms part of the border between Michigan and Wisconsin; as such, the AOC exists in both states. The Torch Lake AOC is located in the Keweenaw Peninsula of Michigan's Upper Peninsula and includes Torch Lake and the land beyond the lake's western shoreline, where waste from copper mining contributes to contaminant loadings. Torch Lake is connected to Lake Superior through Portage Lake by the Keweenaw Waterway's North and South entry.

The Lower Menominee River AOC was delisted from the AOC program in August 2020. While some CAC members have retired from their roles, a handful of dedicated members are now

deciding how to continue ongoing stewardship. The TLPAC is made up of volunteers and is not nested under any city commission or nonprofit organization.

Figure 1. Map of the 14 AOCs within Michigan. Our team worked with all of the Michigan PACs except for Deer Lake (delisted), Manistique River, St. Marys River, and White Lake (delisted) (Source: Michigan Radio, 2015).



Project Planning

Utilizing Recommendations Made by Previous Student Capstone Projects -- We first analyzed the 24 recommendations from the previous SEAS master's capstone projects to create a smaller set of recommendations that captured the essence of the whole list. Many of the recommendations produced by the three previous capstone projects were similar and had overlapping themes. Further, some of the recommendations were directly targeted at EGLE and were not relevant to the PACs.

We distilled the 24 recommendations into a shortlist of eight (Appendix A) and provided examples to showcase possible implementation methods for each recommendation. These eight recommendations and their definitions were:

- (1) PAC Structure: to define and implement a clear division of labor within PACs;
- (2) PAC Champions: to formally recognize a PAC champion to cover differing organizational roles/fields;
- (3) PAC Recruitment: to conduct strategic recruitment for PAC membership which

Allows for meaningful community and organizational representation within the PAC;

- (4) Partner Organizations: to develop a network of partners that will strengthen current stewardship capacity and persist after delisting;
- (5) Community Stewardship: to incorporate community sense of place to change negative public perceptions of the water bodies and encourage community engagement in ongoing restoration and maintenance efforts;
- (6) Community Education: to develop strategies for meaningful community outreach, develop educational and informational materials, create relationships, and facilitate storytelling and local knowledge;
- (7) Life After Delisting: to strategize, prepare, and develop a vision of future organizational structure by planning for life after delisting when exiting the AOC program; and
- (8) Funding for Life After Delisting: to build fundraising capacity from external funding sources for continued organizational capacity after delisting.

We recognized that even this shortlist of eight recommendations contains overlapping themes, yet we could not trim our list down any further without sacrificing important concepts from each of these final proposed recommendations.

Interview Approach -- We conducted two phases of interviews with PAC members and EGLE AOC coordinators to assess which of our proposed recommendations each Michigan PAC would be interested in and have the capacity for implementing. Phase I consisted of individual interviews with PAC members and AOC coordinators. Phase II consisted of 10 different community discussions—one with each PAC and their respective AOC coordinator. We were provided current contact information for PAC members by EGLE. We then sent emails to every PAC member from currently listed AOCs to request an interview. Our interviews did not begin until we heard back from at least three members of each PAC to obtain a sufficient sample size per PAC. For the Clinton River PAC and the Lower Menominee River CAC, we scheduled three interviewees, with last-minute changes resulting in only two members participating in Phase I interviews. We did not receive responses from members of the St. Marys River or Manistique River PACs, so we did not include them in our project.

We interviewed each of the four AOC coordinators to understand the state's perspective on and experience with each PAC. We scheduled each interviewee—PAC members and AOC coordinators—individually. There were two cases in which we interviewed multiple PAC members at one time due to scheduling constraints; these interviews were conducted the same as our individual interviews. We completed all interviews between June and August of 2020.

Phase I Data Collection

Conducting Interviews with PAC Members to Discern Recommendations of Interest -- We designed Phase I interviews to determine which, if any, of our recommendations each PAC would be interested in and ready to implement. Before each Phase I interview, we sent a reminder email to each interviewee containing the final condensed list of our eight proposed recommendations. We attached to each email a summary of our project's goals and timeline to prepare PAC members for their interviews. We conducted each interview virtually via the Zoom video conference platform (Zoom, 2021) due to University of Michigan COVID-19 restrictions on in-person research. We informed each participant that we would delete the recordings of their interviews after our project was completed to preserve confidentiality. This allowed PAC members to speak openly with us, as we did not attribute any quotes to specific individuals.

We conducted 39 interviews with 35 PAC members from 10 different PACs and all four EGLE AOC coordinators. Each interview lasted approximately 90 minutes. We conducted interviews with two of our four team members as not to overwhelm interviewees with a disproportionate interviewee-to-interviewer ratio. One team member asked the interviewee our scripted questions (Appendix B), as well as follow-up questions depending on the flow of our discussion. The other team member took notes according to our project's template and intermittently asked follow-up questions.

We asked a series of questions during each interview to better understand each PAC's functionality and organizational capacity. As each PAC has a unique history, setting, and structure, we wanted to better understand each one to develop a more personal final product. We aimed to accomplish three key objectives with our interview guide: (1) to determine meaningful recommendations to build a more effective PAC; (2) to determine the PAC's capacity to achieve their noted recommendations of interest; and (3) to determine what resources would necessitate the successful implementation of each recommendation by PACs.

We started each interview by describing our project's goals and then clarified the interviewee's willingness to participate in our project. Once we received consent to record the interview, we described our shortlist of eight recommendations and offered to answer any lingering questions about our project. Finally, we asked scripted and follow-up questions covering: the interviewee's involvement with the PAC, their current strengths and weaknesses as an organization, which recommendations would be most suitable to their PAC, and the capacity of their PAC to implement each of their noted recommendations. We also asked a follow-up question to determine the interviewees' interest in any additional recommendations that we did not include in our shortlist. After each interview, we sent interviewees a thank you note and a survey using Google Forms to assess the content and quality of our interview (Google, 2021a). The content of these surveys will not be included in our results since they served only to gather feedback on our Phase I interviews before Phase II community discussions.

Phase I Interview Data Analysis

One-Page Theme Documents -- Following each Phase I interview, we transcribed the recording using Trint software and stored each transcript as a Google Doc in a team-shared Google Drive (Trint, 2021; Google, 2021b; Google, 2021c). Using our gained anecdotal knowledge and insights from these transcripts, we developed one-page theme documents for each of the PACs summarizing what we heard in Phase I (Appendix C). This included what the PAC members viewed as their organization's strengths, areas for improvement, and the recommendations they were interested in implementing. We then sent the one-page theme documents to each PAC member we interviewed for their review and feedback. We wanted to ensure that as we began building out our guides for Phase II conversations, we were accurately portraying each PAC's expressed needs and interests.

Hand-Coding Data -- After transcribing every Phase I interview and creating one-page theme documents, we developed a codebook to determine the accuracy of these documents and to build out our research implications (Appendix D). A codebook is a way to analyze transcripts to understand key themes among each interview systematically. This step, however, was done following the general development of themes that informed our Phase II conversations. As we analyzed each interview transcription, we categorized specific quotes—a process called coding—that indicated each PAC's progress toward our codebook's four codes: (1) interest; (2) readiness; (3) progress; and (4) perception. Our team created these codes based on the objectives of our project; however, not all interviewees discussed each category equally. This resulted in the coding categories not holding the same weight when hand-coding. Readiness, for example, was not a question directly asked during Phase I conversations, so fewer quotes were coded as "readiness."

We coded a quote as "interest" if the interviewee indicated they are interested in implementing a particular recommendation. Since the "interest" category most closely addressed our project's main research questions, we most often included recommendations with the most "interest" codes among each PAC in their implementation plans. We coded a quote as "readiness" if the interviewee indicated their PAC was either ready or not ready to implement their desired recommendation. For example, if all members of a PAC indicated an interest in delisting from the AOC program, but their organization was not yet ready to fully implement this recommendation, we coded this as "not ready." We coded a quote as "progress" if the interviewee indicated their PAC has already implemented, is currently implementing, or has not started implementing a recommendation. As such, we separated this code into three categories of progress: "accomplished," "currently being worked on," and "no progress." Lastly, we coded a quote as "perception" if the interviewee indicated that other members of their PAC would agree or disagree with the particular recommendation; we did not include the code of "perception" in our results due to an insignificant amount of codes.

During the coding process for Phase I, we coded “progress,” “interest,” and “readiness” across the list of recommendations for each PAC. Each individual only needed to indicate progress, interest, or readiness once to be considered a “verbal vote” for that category, and each individual was only counted once. For example, if a PAC only had two interviewees, then the most votes possible in one category is two. The recommendations with the most interest, or lack of progress coupled with sufficient interest, were considered the key recommendations for that PAC.

Auto-Coding Data -- To ensure our hand-coding was as unbiased as possible, we also conducted a qualitative analysis of Phase I transcripts through an auto-coding process using NVivo software (NVivo-QSR International, 2020). We uploaded our transcripts for each PAC member’s interview into the NVivo program and sorted them by PAC. We did not analyze the transcripts for AOC coordinators since they discussed the multiple PACs they oversee; instead, we used these transcripts to inform our Phase II community discussions and implementation plans. Then, we autocoded each transcript utilizing a feature in NVivo that detects themes among various transcripts. NVivo identifies themes that encompass sentiments throughout each transcript and codes them according to the amount of mentions correlated to each theme. We completed this process ten times—once for each PAC—to find which themes were most prevalent among each interviewee within each PAC.

We then sorted each of the PAC’s autocoded themes into separate tables. We sorted each PAC’s theme table by the total number of mentions per theme (i.e., the themes with the most mentions by each PAC member were displayed first in the table and sequentially decreased with less prevalent themes). We deleted any auto-detected themes that did not relate to our shortlist of recommendations, such as “things,” “like,” “yeah,” and other filler words that were picked up from our transcripts. We did not identify a set number of themes to include in each PAC table, so we expected each PAC would have a varying total amount of autocoded themes. Finally, we conducted this same analysis by auto-coding state-wide themes among all ten PACs in our study. We did not hand-code state-wide themes, as we did not create a state-wide implementation plan. However, we were interested in finding out how these themes connected each PAC across the Michigan AOC program.

It is important to note that while our hand-coding lumped multiple themes into one recommendation, our auto-codes in NVivo allowed us to see how they differed in internal details. While our hand-coded themes led to our implementation plans, our auto-coded themes checked our interpretation of each interview.

Phase II Community Conversations

Once Phase I interviews were completed, we scheduled Phase II community conversations with each PAC via email invitations. Our three objectives for these discussions were: (1) to showcase similarities in noted recommendations across the entire Michigan AOC program; (2) to

brainstorm how each PAC could begin implementing the recommendations of noted interest from Phase I; and (3) to invigorate a passion for action within each PAC. We spoke with individuals that participated in Phase I interviews, other members of the PAC, and the PAC's AOC coordinator.

To accomplish these objectives, we developed a discussion guide to facilitate a fluid, flowing conversation among all PAC members and their AOC coordinator (Appendix E). Our guide consisted of two main sections: (1) team-building exercises to create a trusting and communal environment; and (2) questions to build dialog around the recommendations of interest among PAC members and their AOC coordinator. We began by discussing ground rules to ensure each participant had an equal opportunity to speak and contribute to the conversation. We then asked our team-building questions to ensure all participants felt comfortable speaking openly in the space we had created. We ended our conversations with questions to extract content for each PAC's implementation plan.

We conducted 10 Phase II conversations between August and November of 2020. Each conversation lasted approximately two hours. All members who participated in Phase I were invited to participate in Phase II, yet not all did; 33 PAC members from Phase I and all four AOC coordinators were involved in Phase II. Two additional members from the Clinton River PAC and one additional member from the Lower Menominee River CAC who were not involved in Phase I joined for Phase II. We held these community conversations through the Zoom platform. We divided team member responsibilities in the same manner as Phase I interviews; two team members conducted each community discussion, with one guiding the conversation and the other taking notes. It was crucial that the conversation guide acted as a facilitator, as our role in these community discussions was to be active listeners and take detailed notes.

We recorded all ten Phase II conversations for our reference and to allow unavailable PAC members to listen and gain insight. We did not transcribe Phase II conversations, and there was no follow-up coding necessary. Notes from these conversations were our primary source of information for developing implementation plans. Specifically, we asked pointed questions to determine the barriers to implementing their recommendations of interest and the exact steps they intended to take to implement these recommendations.

Implementation Plan Development

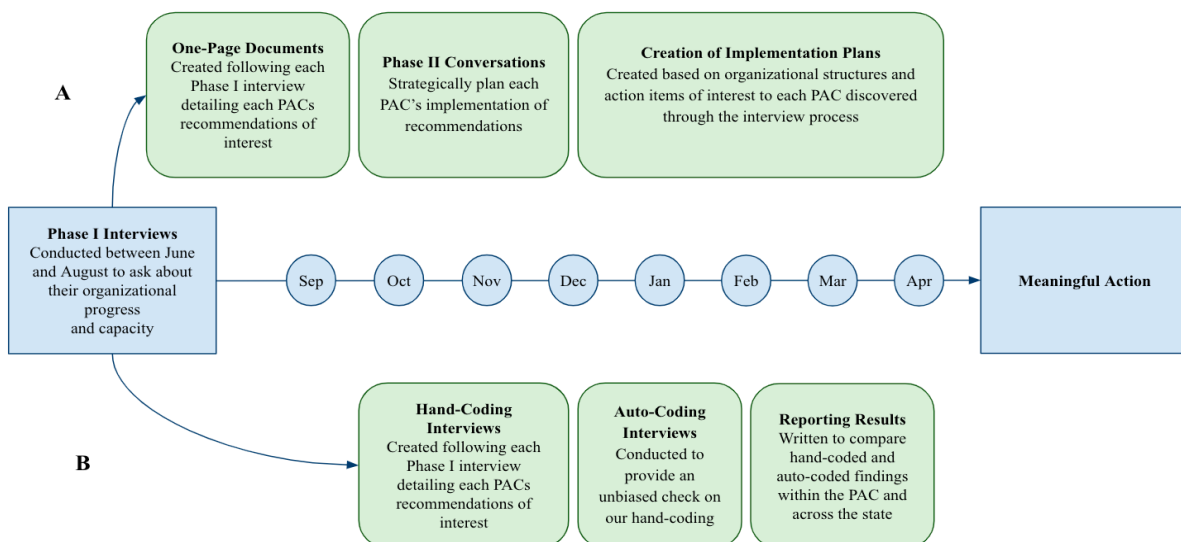
Using the information gathered from our Phase I interviews and Phase II community conversations, we drafted implementation plans for each of the 10 Michigan PACs that took part in our project (<https://doi.org/10.7302/04tt-ra25>). Plans were mainly based on content from our Phase II community conversations, as we used Phase I interviews to develop themes within PACs to conduct Phase II. In these documents, we synthesized PAC member suggestions, ideas, and stories into a clear and explicit implementation plan. Each PAC's implementation plan was

meant to be by the PAC, and for the PAC; we crafted all of our recommendations and suggestions to directly reflect the words of participating PAC members.

We separated each plan into three main sections: (1) Organizational Structures to Institute; (2) Action Items to Achieve; and (3) Additional Insights. We then divided the first two main sections into one- to two-year and three- to five-year time frames to delineate between short- and long-term goals and actions. While PAC members did not always specify when they would like to achieve their stated goals, we used our judgment to determine how long each organizational structure or action item would take to incorporate.

We included PAC members' next steps in the Organizational Structures to Institute section if they dealt with incorporating or amending a structural component to their organization, and in the Action Items to Achieve section if they could be accomplished by taking specific action within their current organizational framework. For example, if a PAC member stated their interest in starting a committee for conducting fundraising, we placed this task in the first section, Organizational Structures to Institute, as it pertains to amending the structure of their organization. In contrast, if a PAC member indicated they would like to advertise educational events on their website or social media pages, we included this in the Action Items to Achieve section, as it does not alter the organizational makeup of the PAC and is an actionable step. Finally, we incorporated the Additional Insights section to add suggestions for organizational structures and action items directly from our team. We also included suggestions for EGLE and, more specifically, the PAC's AOC coordinator within the Additional Insights section.

Figure 2. Project Methodological Timeline. A: The data collection and writing of recommendations. B: The qualitative analysis process and writing of results. Numbers in the middle correspond to the month in which these processes took place (September 2020-April 2021).



RESULTS

Individual PAC Themes from Phase I Interviews

Our auto-coding served to confirm our hand-coded findings; however, it is not intuitive how these two sets of findings relate to each other. Therefore, it is important to understand both our hand-coded and auto-coded results, as well as the relationship between them. We found from our auto-coding that the number of times PAC members mentioned a particular theme throughout Phase I interviews does not necessarily correlate with the prevalence of the theme based on hand-coding. Some mentions were due to PAC members describing the progress made toward achieving specific recommendations rather than explaining their interest in implementing them. Other mentions correlated with similar themes recorded in the NVivo auto-coded results, such as various aspects of the PACs' organizational structure.

All recommendations were discussed at least once by Michigan PACs. The majority (seven PACs) voiced an interest in community education. The other recommendations PACs chose to implement were: PAC recruitment (five PACs), funding for life after delisting (five PACs), PAC structure (four PACs), life after delisting (three PACs), partner organizations (two PACs), community stewardship (two PACs), and PAC champions (one PAC) (Table 23).



Photo courtesy of MLWP member.

Clinton River PAC (PAC)

Hand-coded Results -- Hand-coding for Clinton River PAC (PAC) transcripts showed the primary recommendations of interest for the implementation plan to be: community stewardship (two votes of interest) and funding for life after delisting (one vote of interest). At least one PAC member was also interested in: PAC structure, champions, recruitment, partner organizations, life after delisting, or funding for life after delisting (Table 1). Although PAC members mentioned community education often (Table 2), it was mainly in reference to previous projects that have already been completed. Community stewardship, however, corresponds well to the mention of community and allows room for growth (Table 2). Similarly, funding for life after delisting was included as a recommendation to implement due to themes such as funding and grants being at the forefront of the conversation.

Table 1. Clinton River PAC Hand-coded Results. Hand-coded progress, interest, and readiness of the Clinton River PAC, per the eight organizational recommendations. Bolded recommendations were included in the PAC’s implementation plan. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe the PAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	2	Community Stewardship	<i>Progress</i>	2
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	1	Community Education	<i>Progress</i>	3
	<i>Interest</i>	1		<i>Interest</i>	0
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	2	Life After Delisting	<i>Progress</i>	1
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	2
Partner Organizations	<i>Progress</i>	2	Funding for Life After Delisting	<i>Progress</i>	1
	<i>Interest</i>	1		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	1

Auto-coded Results -- Auto-coding for the Clinton River PAC transcripts showed the top five mentioned themes to be: *education, community, funding, citizens, and engineering firms* (Table 2). The most common theme for the PAC, *education*, directly relates to the interviewees’ description of progress made toward the community education recommendation (Table 1).

Additionally, themes of *community* and *community stewardship* relate to our hand-coded results that show the PAC is interested in implementing the community stewardship recommendation. Themes such as *citizens* and *engineering firms* correlate to our findings that interviewees believe their PAC has made progress towards recruiting Clinton River AOC community members (two votes of progress) and partnering with various organizations, namely engineering firms (two votes of progress) (Table 1).

Other themes mentioned include: *grants*, *structure*, *monitoring*, and *gardens*, which relate to the PAC member’s interest in securing funding for life after delisting (one vote of interest) and progress made toward establishing a solidified structural foundation for the PAC (two votes of progress) (Table 1). We found that themes of *monitoring* and *gardens* both expand on specific goals for community stewardship, including conducting citizen science monitoring programs and garden stewardship around the Clinton River AOC.

Table 2. Clinton River PAC Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. The middle two column headers refer to the two Clinton River PAC participants in Phase I interviews. The backgrounds of each column are colored based on the number of times each PAC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions between both PAC members in their Phase I interviews.

Theme	C1	C2	Total Mentions
Education	57	165	222
Community	43	133	176
Funding	8	120	128
Citizens	84	20	104
Engineering Firms	75	27	102
Grants	20	77	97
Structure	20	67	87
Monitoring	16	69	85
Gardens	56	24	80
Community Stewardship	43	28	71

Detroit River PAC (PAC)

Hand-coded Results -- Hand-coding for Detroit River PAC (PAC) transcripts showed the primary recommendations of interest for the implementation plan to be: community stewardship (four votes of interest), community education (four votes of interest), and funding for life after delisting (two votes of interest) (Table 3). We found that while all five interviewees believe the PAC has made progress toward community stewardship (five votes of progress) and community education (five votes of progress), there was also strong interest to build these out further with a focus on diversity, equity, and inclusion (DEI). We also found that despite PAC members’

interest in implementing funding for life after delisting, they indicated progress in this area as well (two votes of progress).

Other recommendations we heard from PAC members were partner organizations (five votes of progress), PAC structure (three votes of progress), and PAC champions (three votes of progress). PAC members indicated that roles are clearly documented to allow champions to divide tasks and delegate responsibilities (Table 3).

Table 3. Detroit River PAC Hand-coded Results. Hand-coded progress, interest, and readiness of the Detroit River PAC, per the eight organizational recommendations. Bolded recommendations were included in the PAC’s implementation plan. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe the PAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	3	Community Stewardship	<i>Progress</i>	5
	<i>Interest</i>	1		<i>Interest</i>	4
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	3	Community Education	<i>Progress</i>	5
	<i>Interest</i>	3		<i>Interest</i>	4
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	2	Life After Delisting	<i>Progress</i>	2
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	1
Partner Organizations	<i>Progress</i>	5	Funding for Life After Delisting	<i>Progress</i>	2
	<i>Interest</i>	2		<i>Interest</i>	2
	<i>Readiness</i>	1		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for the Detroit River PAC transcripts showed the top five mentioned themes to be: *habitat*, *meetings*, *community*, *grants*, and *funding* (Table 4). The most common theme for the PAC, *habitat*, is not immediately recognized as one of our eight recommendations. Within the context of our hand-coded themes, we find that the theme of *habitat* relates to PAC projects that fall under the category of community stewardship (Table 3). We found that PAC members believe they have made progress on their structure from the high number of mentions of the auto-coded themes *meetings* and *committees*. This is supported by

their indication of progress toward the PAC structure recommendation in our hand-coded results (three votes of progress).

The other themes mentioned by Detroit River PAC members were *opportunities* and *community stewardship*. We have already discussed stewardship within the theme of *habitat*, but the theme of *opportunities* correlates with the PAC’s various recommendations of interest. We found that the PAC has created opportunities for fundraising and recruiting with various partner organizations. This was confirmed by all five interviewees, indicating their progress towards establishing partnerships (Table 3). Finally, we found that the themes of *funding* and *opportunities* relate to PAC members' interest in finding further funding opportunities when preparing for life after delisting.

Table 4. Detroit River PAC Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle five column headers refer to the five Detroit PAC participants in Phase I interviews. The columns are colored based on the amount of times each PAC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all five PAC members in their Phase I interviews.

Themes	D1	D2	D3	D4	D5	Total Mentions
Habitat	60	267	0	41	60	428
Meetings	0	44	165	50	14	273
Community	43	35	93	40	14	225
Grants	26	144	0	0	54	224
Funding	52	83	0	0	66	201
Opportunities	52	46	59	0	0	157
Committees	60	0	48	0	0	108
Community Stewardship	33	12	18	29	7	99

Kalamazoo River Watershed Council (KRWC)

Hand-coded Results -- Hand-coding for KWRC transcripts showed the primary recommendations of interest for the implementation plan to be: community education (three votes of interest), PAC recruitment (five votes of interest), and partner organizations (three votes of interest) KRWC’s primary recommendations of interest for the implementation plan (Table 5). We found that KRWC members believe their PAC has an effective organizational structure (five votes of progress), as well as various champions with technical knowledge on specific watershed functions that aid in engaging agencies and the general public (three votes of progress). We found that KRWC prioritizes community education (three votes for progress) and hosts many outreach and engagement events that highlight AOC stewardship work.

We found that although KRWC has made great strides in education and outreach (three votes of progress), members still have a desire to expand these efforts (three votes of interest) (Table 5). For example, interviewees indicated that some underrepresented communities have been left out of education and outreach, so KRWC would like to provide a more inclusive environment. Similarly, interviewees expressed a need for continued recruitment (five votes of interest) to allow KRWC to have meaningful community and organizational representation. Through diverse and inclusive recruitment, there is also the opportunity to gain champions in various fields (one vote of interest).

Table 5. Kalamazoo River Watershed Council Hand-coded Results. Hand-coded progress, interest, and readiness of KRWC, per the eight organizational recommendations. Bolded recommendations were included in KRWC’s implementation plan. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe KRWC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	5	Community Stewardship	<i>Progress</i>	2
	<i>Interest</i>	0		<i>Interest</i>	4
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	3	Community Education	<i>Progress</i>	3
	<i>Interest</i>	1		<i>Interest</i>	3
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	4	Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	5		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	0
Partner Organizations	<i>Progress</i>	3	Funding for Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	3		<i>Interest</i>	1
	<i>Readiness</i>	1		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for KRWC transcripts showed the top five mentioned themes to be: *funding, community, partners, structure, and planning* (Table 6). The most common theme for KRWC, *funding*, fits within the context of each of their recommendations of interest (Table 5). We found that KRWC members want to gain more funding from various partnerships to conduct strategic recruitment and engage with the community through educational programs and materials. Additionally, we found that the theme of *funding* relates directly to many of KRWC’s most mentioned auto-coded themes, including *partners, memberships, community education, and support*.

Other themes mentioned include: *translators*, *strategic planning*, and *outreach*. Most of KRWC’s auto-coded themes dealt directly with their recommendations of interest, as evidenced by several references to various aspects of recruitment, partnerships, and education within each transcript. Since five KRWC members took part in our project, there are instances where only two or three members mentioned a theme; only one theme, *community*, was mentioned by four different members. However, considering the large overlap among all of KRWC’s auto-coded themes, all five members discussed some aspects of each of their three recommendations of interest.

Table 6. Kalamazoo River Watershed Council Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle five column headers refer to the five KRWC participants in Phase I interviews. The columns are colored based on the amount of times each KRWC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all five KRWC members in their Phase I interviews.

Theme	K1	K2	K3	K4	K5	Total Mentions
Funding	0	27	38	177	0	242
Community	44	87	25	0	11	167
Partners	77	14	0	74	0	165
Structure	42	0	34	61	0	137
Planning	54	56	0	0	14	124
Membership	23	0	0	92	0	115
Translators	36	31	0	35	0	102
Organization	15	0	38	37	0	90
Community Education	15	31	23	0	0	69
Strategic Planning	54	12	0	0	0	66
Outreach	0	25	0	20	11	56
Support	44	6	0	0	0	50

Lower Menominee River Citizens Advisory Council (CAC)

Hand-coded Results -- Hand-coding for CAC transcripts showed the primary recommendations of interest for the implementation plan to be: PAC structure (three votes of interest), PAC recruitment (two votes of interest), and life after delisting (three votes of interest) (Table 7). We heard that the CAC had made progress towards community stewardship (three votes of progress) and partner organizations (three votes of progress).

We found that the CAC would like to work on its organizational structure to ensure clear roles and distributed and maintained responsibilities among CAC members. Next, the CAC would like to expand its recruitment to ensure its longevity after AOC delisting. Finally, the CAC indicated it would like to work on strategic planning and securing funding for life after delisting. This recommendation is especially relevant since the AOC was delisted in August 2020.

Table 7. Lower Menominee River CAC Hand-coded Results. Hand-coded progress, interest, and readiness of the Lower Menominee River CAC, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe the CAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	3	Community Stewardship	<i>Progress</i>	3
	<i>Interest</i>	3		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	1
PAC Champions	<i>Progress</i>	1	Community Education	<i>Progress</i>	3
	<i>Interest</i>	1		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	2	Life After Delisting	<i>Progress</i>	2
	<i>Interest</i>	2		<i>Interest</i>	3
	<i>Readiness</i>	0		<i>Readiness</i>	2
Partner Organizations	<i>Progress</i>	3	Funding for Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	2		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for CAC transcripts showed the top five mentioned themes to be: *community, public, meetings, management, and planning* (Table 8). The most common theme for the CAC, *community*, is related to the progress made toward community education (three votes of progress) and community stewardship (three votes of progress) (Table 7).

Main auto-coded themes such as *public, meetings, planning, groups, members, and structure* are related to all three of the Lower Menominee CAC's hand-coded recommendations of interest (Table 7). We found these themes to relate to CAC members' desire for a more solidified structure and recruitment plan to establish an organization after delisting.

Table 8. Lower Menominee River CAC Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle three column headers refer to the three Lower Menominee CAC participants in Phase I interviews. The columns are colored based on the number of times each CAC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all three CAC members in their Phase I interviews.

Theme	Me1	Me2	Me3	Total Mentions
Community	407	70	24	501
Public	51	116	0	167
Meetings	125	0	13	138
Management	90	0	25	115
Planning	85	0	15	100
Group	0	32	61	93
Members	35	0	46	81
Structure	0	15	36	51

Muskegon Lake Watershed Partnership (MLWP).

Hand-coded Results -- Hand-coding for MLWP transcripts showed the primary recommendations of interest for the implementation plan to be: community education (two votes of interest) and funding for life after delisting (three votes of interest) (Table 9). Hand-coding also showed that all three MLWP interviewees believe their PAC has made significant progress toward creating an effective organizational structure (three votes of progress). We found that MLWP has individual PAC champions for multiple topics (one vote of progress) and a broad network of partner organizations (two votes of progress) (Table 9). We also found that MLWP members think their organization fosters successful community education (three votes of progress) and community stewardship (three votes of progress). However, since a vote of progress does not necessarily mean there is no work left to be done, we also found that MLWP members want to continue to broaden their current community education efforts (two votes of interest) (Table 9).

We found that while MLWP has made great strides toward community outreach, its members desire continued growth in building out DEI when conducting community education (two votes of interest). Building new community connections can also enhance MLWP membership, which allows for meaningful community and organizational representation. We heard that MLWP is also currently working toward life after delisting (one vote of progress) since a significant focus for MLWP is securing funding for life after delisting (three votes of interest) (Table 9).

Table 9. Muskegon Lake Watershed Partnership Hand-coded Results. Hand-coded progress, interest, and readiness of MLWP, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of

individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe MLWP is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	3	Community Stewardship	<i>Progress</i>	3
	<i>Interest</i>	1		<i>Interest</i>	3
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	1	Community Education	<i>Progress</i>	3
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	2	Life After Delisting	<i>Progress</i>	1
	<i>Interest</i>	2		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	0
Partner Organizations	<i>Progress</i>	2	Funding for Life After Delisting	<i>Progress</i>	3
	<i>Interest</i>	2		<i>Interest</i>	3
	<i>Readiness</i>	0		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for MLWP transcripts showed the top five mentioned themes to be: *staff*, *community*, *committees*, *media*, and *education* (Table 10). We found that the most common theme, *staff*, relates to MLWP’s recommendations of interest: community education and funding for life after delisting (Table 9). This is because we heard that MLWP members desire more staff to conduct community education and to solidify its organizational capacity after delisting. While *funding* was tied for the seventh-most mentioned theme among MLWP members, it was usually mentioned in conjunction with life after delisting, which warranted including funding for life after delisting in MLWP’s implementation plan.

We found that some auto-coded themes were directly related to each other, such as *business*, *media*, and *partnerships* (Table 10). MLWP members mentioned each of these themes within the context of community education. Other commonly mentioned themes included: *habitat*, *activities*, *community stewardship*, *organizations*, and *cleanup*. Most of these themes pertain to the overarching recommendation of community stewardship, which MLWP members indicated they have made progress toward (three votes of progress) (Table 9). However, we did not include the community stewardship recommendation in MLWP’s implementation plan because aspects of stewardship deal directly with conducting community education after delisting. These nuances show how important the hand-coded context is for each of our auto-coded themes.

Table 10. Muskegon Lake Watershed Partnership Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle three column headers refer to the three MLWP participants in Phase I interviews. The columns are colored based on the amount of times each MLWP member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all three MLWP members in their Phase I interviews.

Theme	Mu1	Mu2	Mu3	Total Mentions
Staff	363	45	64	472
Community	31	198	53	282
Committees	158	51	0	209
Media	85	65	52	202
Education	67	107	0	174
Habitat	71	95	0	166
Activities	0	31	111	142
Funding	32	110	0	142
Business	78	60	0	138
Community Stewardship	0	86	12	98
Organizations	54	0	34	88
Cleanup	51	0	34	85
Partnership	23	0	34	57

River Raisin PAC (PAC)

Hand-coded Results -- Hand-coding for River Raisin PAC (PAC) transcripts showed the primary recommendations of interest for the implementation plan to be: community education (one vote of interest), life after delisting (two votes of interest), and funding for life after delisting (two votes of interest) (Table 11). Three PAC members also noted that the PAC has made considerable progress toward conducting community education (three votes of progress), and although community education only has one vote of interest, another member voiced that there is always further room for growth in education. In addition, even though partner organizations had two votes of interest, we found that partnerships should be built into the PAC's recommendations of interest regarding delisting (two votes of interest). Hand-coded votes of progress showed a rich inventory of partnerships that could be revived and utilized to assist in progressing toward delisting.

Overall, interviewees expressed the need for a plan that specifies what life after delisting will look like in terms of structure, funding, and partnerships. PAC members believe that community education and partner organizations are needed to build a durable organization after the River Raisin AOC is delisted.

Table 11. River Raisin PAC Hand-coded Results. Hand-coded progress, interest, and readiness of the River Raisin PAC, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe the PAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	2	Community Stewardship	<i>Progress</i>	2
	<i>Interest</i>	2		<i>Interest</i>	0
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	2	Community Education	<i>Progress</i>	3
	<i>Interest</i>	2		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	1	Life After Delisting	<i>Progress</i>	1
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
Partner Organizations	<i>Progress</i>	1	Funding for Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	2		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for River Raisin PAC transcripts showed the top five mentioned themes to be: *outreach programs, activities, school, material, and community* (Table 12). The most common theme among PAC members, *outreach programs*, is embedded within their chosen recommendation for implementation, community education (one vote of interest (Table 11)). We found that the theme of *outreach programs* also entails the PAC’s desire to include a broader constituency of community members leading up to and after delisting. This shows that Raisin PAC members are very interested in reaching out to new members of the River Raisin AOC community, as evidenced by such themes as *outreach programs, activities, school, material, and events*.

Auto-coded results showed the PAC also mentioned other themes, such as: *wastewater, roles, strategic planning, support, funding, organization, and structure* (Table 12). We understand that some of these themes, such as *roles, organization, and structure*, all pertain to the PAC structure recommendation. Most references to these themes were because the PAC indicated they had made progress on these aspects of PAC structure (two votes of progress). Additionally, the auto-coded themes of *support* and *funding* relate to our finding that the PAC is interested in implementing the funding for life after delisting recommendation to expand funding sources after

the River Raisin AOC is delisted (two votes of interest). We found the theme of *wastewater* relates to the PAC’s partnership with the city’s wastewater department through COTE and *strategic planning* shows their interest in preparing for life after delisting (two votes of interest) (Table 11).

Table 12. River Raisin PAC Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle three column headers refer to the three River Raisin PAC participants in our Phase I interviews. Backgrounds of each of these columns are colored based on the amount of times each PAC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all three PAC members in their Phase I interviews.

Theme	Ra1	Ra2	Ra3	Total Mentions
Outreach Programs	59	92	67	218
Activities	0	23	134	157
School	21	72	29	122
Material	11	101	0	112
Community	53	0	57	110
Wastewater	26	47	35	108
Role	44	0	55	99
Events	7	0	68	75
Strategic Planning	37	0	29	66
Support	46	0	20	66
Funding	29	0	34	63
Organization	21	42	0	63
Structure	37	0	21	58

Rouge River Advisory Council (RRAC)

Hand-coded Results -- Hand-coding for RRAC transcripts showed the primary recommendations of interest for the implementation plan to be: PAC champions (four votes of interest), PAC recruitment (four votes of interest), community education (three votes of interest), and life after delisting (two votes of interest) (Table 13). The RRAC members noted that they have made progress in all four of these areas, yet there is still room for improvement. We found that RRAC members believe they have made progress toward PAC structure (five votes of progress), PAC recruitment (two votes of progress), and partner organizations (three votes of progress) (Table 13). We understand that RRAC recruits many volunteers to carry out stewardship projects throughout the watershed through partnerships with FOTR and ARC.

Community members seem to lack knowledge of events and planning procedures, as well as the existence of the AOC in the first place. There is a desire to include a wider and more diverse array of community members when conducting PAC projects and recruiting members into the

RRAC. While delisting is not in the near-term future, we heard that the RRAC would like to begin planning how its organizational structure will change throughout the transition into delisting. Finally, establishing PAC champions within RRAC would help to distribute PAC work among members.

Table 13. Rouge River Advisory Council Hand-coded Results. Hand-coded progress, interest, and readiness of RRAC, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe RRAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	5	Community Stewardship	<i>Progress</i>	2
	<i>Interest</i>	4		<i>Interest</i>	1
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	1	Community Education	<i>Progress</i>	3
	<i>Interest</i>	4		<i>Interest</i>	3
	<i>Readiness</i>	1		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	2	Life After Delisting	<i>Progress</i>	4
	<i>Interest</i>	4		<i>Interest</i>	2
	<i>Readiness</i>	1		<i>Readiness</i>	2
Partner Organizations	<i>Progress</i>	3	Funding for Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	3		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for RRAC transcripts showed the top five mentioned themes to be: *community*, *habitat*, *permits*, *structure*, and *resources* (Table 14). The most common auto-coded theme for RRAC, *community*, corresponded with our hand-coded findings of interest in community education (three votes of interest) and PAC recruitment (four votes of interest) (Table 13). We found that the RRAC is interested in connecting with the Rouge River AOC community through educational outreach, as well as recruiting members into their organization. Other main themes such as *permits*, *structure*, *nonprofits*, and *committees* correspond with various aspects of RRAC’s unique organizational structure with close partners such as ARC and FOTR.

We found that the two monetary themes, *funding* and *grants*, correlated with the RRAC’s interest in and progress toward delisting from the AOC program (two votes of interest; four votes of

progress (Table 13). However, we included life after delisting, not funding for life after delisting, in RRAC’s implementation plan, as we found that RRAC was more prepared to implement life after delisting (two votes of readiness) (Table 13).

Table 14. Rouge River Advisory Council Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle five column headers refer to the five RRAC participants in our Phase I interviews. Backgrounds of each of these columns are colored based on the amount of times each RRAC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all five RRAC members in their Phase I interviews.

Theme	Ro1	Ro2	Ro3	Ro4	Ro5	Total Mentions
Community	176	24	81	212	106	599
Habitat	45	48	44	106	40	283
Permits	64	167	17	17	0	265
Structure	103	17	0	0	98	218
Resources	81	78	0	0	50	209
Funding	0	23	18	128	19	188
Nonprofits	138	15	0	0	0	153
Outreach	81	0	68	0	0	149
Grants	24	41	17	42	24	148
Committees	35	0	103	0	0	138
Monitoring	32	47	0	54	0	133
Education	0	33	0	56	29	118

Partnership for the Saginaw Bay Watershed (PSBW)

Hand-coded Results -- Hand-coding for PSBW transcripts showed the primary recommendations of interest for the implementation plan to be: PAC structure (one vote of interest), community education (three votes of interest), and PAC recruitment (two votes of interest) (Table 15). We heard that PSBW would like to create a more concrete structure that facilitates communication within PSBW and between PSBW and EGLE (one vote of interest). We also heard that many community members are either not involved in or are unaware of the AOC. We found that PSBW would like to continue working on strengthening its education and outreach efforts to community members (three votes of interest). Effective community education leads to strengthened PAC recruitment (two votes of interest), and a more diverse network of partner organizations with similar mission-focused work (two votes of interest).

We found that PSBW has a network of dedicated partner organizations (three votes of progress). While there is always room to create more partnerships or strengthen existing partnerships, the partners that PSBW currently has are an asset. Additionally, we heard that PSBW has a set of dedicated and hardworking PAC champions who are passionate about their work (one vote of

progress); yet, PSBW wants to build on these efforts to recruit more dedicated champions (two votes of interest) (Table 15).

Table 15. Partnership for the Saginaw Bay Watershed Hand-coded Results. Hand-coded progress, interest, and readiness of PSBW, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe the PAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	2	Community Stewardship	<i>Progress</i>	0
	<i>Interest</i>	1		<i>Interest</i>	0
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	1	Community Education	<i>Progress</i>	2
	<i>Interest</i>	1		<i>Interest</i>	3
	<i>Readiness</i>	0		<i>Readiness</i>	1
PAC Recruitment	<i>Progress</i>	1	Life After Delisting	<i>Progress</i>	1
	<i>Interest</i>	2		<i>Interest</i>	0
	<i>Readiness</i>	0		<i>Readiness</i>	0
Partner Organizations	<i>Progress</i>	3	Funding for Life After Delisting	<i>Progress</i>	1
	<i>Interest</i>	2		<i>Interest</i>	0
	<i>Readiness</i>	1		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding for PSBW transcripts showed the top five mentioned themes to be: *community*, *council*, *partnerships*, *business*, and *members* (Table 16). The most common theme for PSBW, *community*, corresponds with the interviewees' interest in implementing community education (three votes of interest) and conducting strategic PAC recruitment (two votes of interest) (Table 15). Additionally, we found the themes of *partners* and *business* to indicate PSBW's progress toward establishing partner organizations, including with local businesses (three votes of progress). The themes of *council* and *members* correlated with our hand-coded results showing PSBW's interest in amending PAC structure—in the form of an updated advisory council structure—and conducting PAC recruitment.

Other mentioned themes include *education* and *beach closings*. We found that the theme of *education* corresponds with our finding that PSBW is interested in implementing community education (three votes of interest) while the theme of *beach closings* concerns a beneficial use impairment within the Saginaw Bay watershed (Table 15).

Table 16. Partnership for the Saginaw Bay Watershed Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle three column headers refer to the three PSBW participants in our Phase I interviews. Backgrounds of each of these columns are colored based on the amount of times each PSBW member mentioned that theme; the more mentions, the darker purple the background. The last column shows the total number of mentions among all three PSBW members in their Phase I interviews.

Theme	Sa1	Sa2	Sa3	Total Mentions
Community	0	145	30	175
Council	71	33	0	104
Partnership	35	48	0	83
Business	46	17	0	63
Members	36	25	0	61
Education	6	23	30	59
Beach closings	32	19	0	51

St. Clair River Binational PAC (BPAC)

Hand-coded Results -- Hand-coding for BPAC transcripts showed the primary recommendations of interest for the implementation plan to be: PAC structure (two votes of interest), PAC recruitment (four votes of interest), and funding for life after delisting (two votes of interest) (Table 17). While interviewees indicated progress toward PAC structure (three votes of progress) and PAC recruitment (one vote of progress), the BPAC can still further build out both of these recommendations.

The St. Clair River BPAC has been progressively working towards delisting and has removed several BUIs. Hand-coding showed that the BPAC has made progress toward community outreach (three votes of progress) and community education (three votes of progress). We heard that these goals are largely tackled by FOSCR. We also found that the BPAC has made progress toward partner organizations (three votes of progress) due to extensive partnerships that set the BPAC up to continue working towards their goal of watershed restoration (Table 17). Overall, interviewees expressed the need to develop a strategic plan to outline what life after delisting will look like structurally and what sorts of partnerships need to be developed to help cultivate funding for life after delisting. Recruitment and continuing to build partnerships are pieces of developing a life after delisting plan and will help with PAC longevity and durability.

Table 17. St. Clair BPAC Hand-coded Results. Hand-coded progress, interest, and readiness of the BPAC, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe the BPAC is ready to implement the recommendation.

Recs	Action	Votes*	Recs	Action	Votes
PAC Structure	<i>Progress</i>	3	Community Stewardship	<i>Progress</i>	3
	<i>Interest</i>	2		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	2	Community Education	<i>Progress</i>	3
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	1	Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	4		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
Partner Organizations	<i>Progress</i>	3	Funding for Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	3		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding of BPAC transcripts showed the top five mentioned themes to be: *community*, *funding*, *health*, *roles*, and *grants* (Table 18). The most common theme for the BPAC, *community*, relates to community stewardship (three votes of progress), community education (three votes of progress), and PAC recruitment (four votes of interest) (Table 17). The most mentioned themes, *community* and *funding*, were also the only two themes that all four BPAC interviewees mentioned. We found the themes of *community* and *funding* to be very important to BPAC members, both in terms of progress made and interest in implementing.

Other mentioned themes include: *capacity*, *committees*, *industry*, and *organizations* (Table 18). Each of these auto-coded themes relate to our hand-coded recommendations of PAC recruitment and partner organizations. We found that these themes also relate to progress made towards partner organizations (three votes of progress) and interest in implementing the PAC recruitment (four votes of interest) (Table 17). The BPAC also mentioned themes of *stewardship*, *structure*, and *education*, each of which corresponded with our recommendations of community stewardship, PAC structure, and community education.

Table 18. St. Clair BPAC Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle four column headers refer to the four BPAC participants in our Phase I interviews. Backgrounds of each of these columns are colored based on the amount of times each BPAC member mentioned that theme; the more mentions, the darker the color purple. The last column shows the total number of mentions among all four BPAC members in their Phase I interviews.

Themes	Sc1	Sc2	Sc3	Sc4	Total Mentions
Community	16	209	102	24	351
Funding	40	131	13	60	244
Health	202	21	0	0	223
Roles	90	47	0	39	176
Grants	92	0	0	83	175
Capacity	40	131	0	0	171
Committees	0	38	77	31	146
Stewardship	54	39	0	39	132
Industry	0	91	40	0	131
Structure	38	93	0	0	131
Organizations	12	13	0	90	115
Habitat	50	0	35	19	104
Community Outreach	0	60	28	0	88
Education	45	5	28	0	78
Events	0	36	34	0	70

Torch Lake Public Action Council (TLPAC)

Hand-coded Results -- Hand-coding for TLPAC transcripts showed the primary recommendations of interest for the implementation plans to be: PAC structure (one vote of interest), partner organizations (two votes of interest), and community education (two votes of interest) (Table 19). The TLPAC members voiced that progress has been made toward PAC structure (one vote of progress), PAC champions (one vote of progress), and PAC recruitment (two votes of progress). We heard that the TLPAC has progressively become more involved with the community but expressed room to improve in this outreach and engagement.

The TLPAC interviewees also stated that there is a need to build increasing involvement within TLPAC, which could look like thoughtful recruitment of champions in various fields including partner organizations or the public. We heard from TLPAC members that much of the public is largely unaware of the Torch Lake AOC. While TLPAC has engaged in efforts to inform the public, interviewees stated that there needs to be further work toward educating the public (two votes of interest). Community members should know why specific environmental problems exist

and how the PAC and EGLE are working together to fix those problems. Equitable and effective community outreach was mentioned as a point of interest in all three TLPAC interviews.

Table 19. Torch Lake Public Action Council Hand-coded Results. Hand-coded progress, interest, and readiness of TLPAC, per the eight organizational recommendations. Bolded recommendations were included in Phase II conversations. Votes indicate the number of individuals who voiced agreement on making progress with the recommendation, are interested in the recommendation, and/or believe TLPAC is ready to implement the recommendation.

Recs	Action	Votes	Recs	Action	Votes
PAC Structure	<i>Progress</i>	1	Community Stewardship	<i>Progress</i>	0
	<i>Interest</i>	1		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Champions	<i>Progress</i>	1	Community Education	<i>Progress</i>	0
	<i>Interest</i>	0		<i>Interest</i>	2
	<i>Readiness</i>	0		<i>Readiness</i>	0
PAC Recruitment	<i>Progress</i>	2	Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	3		<i>Interest</i>	0
	<i>Readiness</i>	0		<i>Readiness</i>	0
Partner Organizations	<i>Progress</i>	1	Funding for Life After Delisting	<i>Progress</i>	0
	<i>Interest</i>	2		<i>Interest</i>	0
	<i>Readiness</i>	0		<i>Readiness</i>	0

Auto-coded Results -- Auto-coding of TLPAC transcripts showed the top five mentioned themes to be: *community*, *outreach*, *events*, *education*, and *structure* (Table 20). Based on TLPAC’s recommendations of interest, we found that the most common auto-coded theme, *community*, refers to community education (two votes of interest) and community stewardship (two votes of interest) (Table 19). However, we chose to include only community education for TLPAC’s implementation plan, as we found that TLPAC’s interest in community stewardship fit more closely with conducting community education. We also found that all three TLPAC interviewees mentioned the themes of *community*, *outreach*, *education*, and *funding*, showing how important each of these themes are to TLPAC.

We found that TLPAC had the fewest overall auto-coded themes of all ten PACs. This is because TLPAC members all discussed similar themes, though this does not necessarily mean that all members agreed on the context of each theme. Most of these themes pertained to hand-coded themes of community education and outreach, both of which were also auto-coded themes.

These findings confirm our hand-coded results that show TLPAC’s interest in the recommendations of community education (two votes of interest) and partner organizations (two votes of interest) (Table 19).

Table 20. Torch Lake Public Action Council Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle three column headers refer to the three TLPAC participants in our Phase I interviews. Backgrounds of each of these columns are colored based on the amount of times each TLPAC member mentioned that theme; the more mentions, the darker purple the background. The last column shows the total number of mentions among all three TLPAC members in their Phase I interviews.

Themes	T1	T2	T3	Total Mentions
Community	434	61	133	628
Outreach	141	83	38	262
Events	151	0	77	228
Education	84	28	39	151
Structure	70	0	57	127
Funding	45	40	20	105

Michigan State-wide PAC Themes

Hand-coded Results -- We found that some themes were prevalent across the entire Michigan AOC program; all eight recommendations had at least one PAC voice progress (Table 21). The few exceptions were: TLPAC and PSBW did not voice progress on community stewardship; TLPAC lacked progress in community education; KRWC, BPAC, and TLPAC each did not voice progress toward life after delisting; and KRWC, PSBW, and TLPAC have not made progress toward funding for life after delisting. The recommendation with the most votes progress was PAC structure with 29 votes, while the recommendation with the least votes of progress was funding for life after delisting, with only seven votes of progress (Table 21).

Votes for readiness were not as prevalent due to their unique coding, but at least one PAC voiced readiness to implement each of the recommendations except PAC structure. This lack of readiness to implement PAC structure is likely due to the vast progress already made toward establishing a solidified structure. The recommendation with the most votes of readiness was partner organizations with three votes. Although PACs often know of partners around their community or previous partnerships held by the PAC, we found that many need guidance on and support for contacting, recruiting, and maintaining strong partnerships (22 votes of interest) (Table 21).

All eight recommendations had some level of interest from PAC members across the program. From most interest to least interest, the prioritized recommendations were: PAC recruitment (25

votes), partner organizations (22 votes), community education (21 votes), community stewardship (19 votes), PAC structure (16 votes), PAC champions (15 votes), life after delisting (15 votes), and funding for life after delisting (14 votes) (Table 21).

Table 21. Michigan AOC Program State-wide Hand-coded Results. Hand-coded results showing state-wide progress, interest, and readiness for each of the PACs involved in the study, per the eight organizational recommendations. Votes indicate the number of individuals who voiced agreement that progress has been made, they are interested in the recommendation, and/or believe the PAC to be ready to implement the recommendation.

PAC Name	PAC Structure			PAC Champions			PAC Recruitment			Partner Organizations		
	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>
Clinton	2	1	0	1	1	0	2	1	0	2	1	0
Detroit	3	1	0	3	3	0	2	1	0	5	2	1
Kalamazoo	5	0	0	3	1	0	4	5	0	3	3	1
Menominee	3	3	0	1	1	0	2	2	0	3	2	0
Muskegon	3	1	0	1	1	0	2	2	0	2	2	0
Raisin	2	2	0	2	2	0	1	1	0	1	2	0
Rouge	5	4	0	1	4	1	2	4	1	3	3	0
Saginaw	2	1	0	1	1	0	1	2	0	3	2	1
St. Clair	3	2	0	2	1	0	1	4	0	3	3	0
Torch	1	1	0	1	0	0	2	3	0	1	2	0
Total Votes	29	16	0	16	15	1	19	25	1	26	22	3
PAC Name	Community Stewardship			Community Education			Life After Delisting			Funding for Life After Delisting		
	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>	<i>Progress</i>	<i>Interest</i>	<i>Readiness</i>
Clinton	2	2	0	3	0	0	1	2	2	1	1	1
Detroit	5	4	0	5	4	0	2	2	1	2	2	0
Kalamazoo	2	4	0	3	3	0	0	1	0	0	1	0
Menominee	3	1	1	3	1	0	2	3	2	0	1	0
Muskegon	3	3	0	3	2	0	1	1	0	3	3	0

Raisin	2	0	0	3	1	0	1	2	0	0	2	0
Rouge	2	1	0	3	3	0	4	2	2	0	2	0
Saginaw	0	0	0	2	3	1	1	0	0	1	0	0
St. Clair	3	2	0	3	2	0	0	2	0	0	2	0
Torch	0	2	0	0	2	0	0	0	0	0	0	0
Total Votes	22	19	1	28	21	1	12	15	7	7	14	1

Auto-coded Results -- The auto-coded themes for all transcripts across the ten PACs showed the top five mentioned themes to be: *community*, *planning*, *funding*, *outreach*, and *grants* (Table 22). The only auto-coded theme mentioned by each of the 10 PACs, *community*, relates to our shortlist of recommendations in various ways depending on the PAC. For example, while some PAC members expressed an interest to include community members more in their AOC-related projects, others detailed their progress toward establishing effective community stewardship practices. Additionally, two of the top five themes across all PACs, *funding* and *grants*, mainly indicate PAC members' interest in finding external funding sources to continue stewardship after their AOC delists. The last two main themes, *planning* and *outreach*, relate to PAC members' desire and previous experience in creating strategic plans and conducting community education via outreach to various communities.

Other mentioned themes related directly to PAC structure, including: *meetings*, *members*, *committees*, *staff*, *structure*, and *management* (Table 22). We found PAC members discussed each of these themes in similar manners; most members indicated an interest in growing PAC membership, establishing committees based on specific topics, and hiring full-time staff members. Additionally, most members expressed progress made toward conducting meetings, solidifying roles and responsibilities, and working directly with executive board members (Table 21).

We found that the remaining auto-coded themes: *support*, *habitat*, *education*, and *media*—except for *education*—had differing connotations depending on the PAC (Table 22). As discussed previously, most PACs described their interest in broadening their community education efforts, which is supported by the auto-coded theme of *education*. We also found that the auto-coded theme of *habitat* related to stewardship projects that improve local habitat. Finally, we found the theme of *media* correlated with PAC members' interest in partnering with various local media sources to showcase PAC projects and get community members involved in and excited about restoring beneficial uses.

Table 22. Statewide Auto-coded Results. The first column shows the themes that were auto-coded from Phase I interviews using NVivo software. Each of the middle ten column headers

refer to each participant in our Phase I interviews separated by PAC. Backgrounds of each of these columns are colored based on the amount of times each PAC member mentioned that theme; the more mentions, the darker purple the background. The last column shows the total number of mentions among all interviewed PAC members in their Phase I interviews.

Theme	Clinton	Detroit	Kalamazoo	Menominee	Muskegon	Raisin	Rouge	Saginaw	St. Clair	Torch	Total Mentions
Community	43	103	129	407	31	53	314	128	62	171	1441
Planning	0	123	110	85	258	37	101	0	131	0	845
Funding	31	115	179	0	142	29	81	0	43	20	640
Outreach	0	94	56	0	34	145	81	63	0	96	569
Grants	34	26	40	55	159	10	61	0	92	40	517
Meetings	28	183	24	125	0	4	5	48	84	0	501
Members	64	0	0	35	39	88	164	61	0	3	454
Support	0	69	44	0	264	46	0	0	0	0	423
Habitat	0	60	0	0	101	50	102	16	85	0	414
Committees	0	92	0	37	158	38	35	0	0	0	360
Staff	0	0	65	0	204	21	21	30	13	0	354
Structure	71	0	61	0	0	37	137	0	38	0	344
Education	91	0	33	0	67	2	17	0	45	47	302

Management	0	14	0	90	48	62	53	13	13	0	293
Media	0	30	32	0	99	22	27	39	0	0	249

Implementation Plan Themes

Phase II Community Conversations -- We conducted Phase II conversations with each of the ten PACs, including their corresponding AOC coordinators. Since we did not record and transcribe our Phase II conversations, we do not have qualitative results for this section. These community conversations informed our development of implementation plans for each PAC, so key points are woven into the *Implementation Plans* section below.

Implementation Plan Themes -- From Phase I interviews, we found that the most common recommendation selected for each PAC’s implementation plan was community education. The recommendations ranked from most to least common are: community education (seven plans), PAC recruitment (five plans), funding for life after delisting (five plans), PAC structure (four plans), life after delisting (three plans), partner organizations (two plans), community stewardship (two plans), and PAC champions (one plan) (Table 23).

We pulled these recommendations from answers to direct questions in Phase I interviews. We sent the recommendations to interviewees before each Phase I interview to ensure they had the knowledge necessary to discuss the recommendations at length. We also set time aside during the interviews to ensure we, as interviewers, answered any remaining questions PAC members had on the recommendations. Phase II conversations allowed for a deeper dive into these chosen recommendations of interest to determine the nuances of how each recommendation should be implemented for each PAC. This led to the development of action sections, statements about the recommendations, and how it fits into its respective PAC. The two sections, called “objectives” in the plans, were created for each PAC to further personalize the recommendations and organize and standardize implementation plans.

Table 23. Recommendation of Interest by Michigan PAC. Recommendations of interest are based on Phase I interviews. The first column shows each PAC, while the second through eighth columns show which PACs indicated interest in each of our eight recommendations. The bottom row shows the total number of PACs that indicated interest in each of our eight recommendations.

PAC Name	PAC Structure	PAC Champions	PAC Recruitment	Partner Organizations	Community Stewardship	Community Education	Life After Delisting	Funding for Life After Delisting
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Clinton					X			X
Detroit					X	X		X
Kalamazoo			X	X		X		
Menominee	X		X				X	
Muskegon						X		X
Raisin						X	X	X
Rouge		X	X			X	X	
Saginaw	X		X			X		
St. Clair	X		X					X
Torch	X			X		X		
Total	4	1	5	2	2	7	3	5

Implementation Plan Objectives -- The two objectives utilized in creating individual implementation plans were based on our Phase II community conversations. By asking pointed questions about each of the recommendations of interest during Phase I interviews, we determined how best to implement recommendations for each PAC. Each PAC, however, may not have only had two recommendations of interest. If a PAC had more than two recommendations of interest, we compiled these into two key objectives and described each at length within one unified section. The PACs with more than two key recommendations were the Detroit River PAC, the KRWC, the Lower Menominee River CAC, the River Raisin PAC, the RRAC, the PSBW, the St. Clair River BPAC, and the TLPAC (Table 24).

Table 24. Objectives for PAC Implementation Plans. Themes of interest built out from recommendations discussed in Phase II community conversations included in PAC implementation plans.

PAC	Themes of Interest (Objectives)
Clinton River PAC	1. Expand Meaningful Community Stewardship 2. Solidify Funding for Ongoing Stewardship
Detroit River PAC	1. Broaden Meaningful Community Engagement 2. Solidify Delisting Structure for Ongoing Stewardship
KRWC	1. Broaden KRWC's Capabilities through Recruitment and Partnerships 2. Expand Meaningful Community Education
Lower Menominee River CAC	1. Solidify Structure for Ongoing Stewardship 2. Recruit New Partners and Members for Post-Delisting Capacity
MLWP	1. Expand Meaningful Community Education 2. Solidify Funding for Ongoing Stewardship

PSBW	<ol style="list-style-type: none"> 1. Strengthen PSBW's Structure and Recruitment 2. Broaden Meaningful Community Education
River Raisin PAC	<ol style="list-style-type: none"> 1. Expand Meaningful Community Outreach 2. Solidify Delisting Structure for Ongoing Stewardship
RRAC	<ol style="list-style-type: none"> 1. Broaden Scope of Community Outreach and Involvement 2. Solidify Post-Delisting Structure and Funding Sources for Ongoing Stewardship
St. Clair River PAC	<ol style="list-style-type: none"> 1. Recruit New Partners and Members for Increased PAC Capacity 2. Solidify Post-Delisting Structure for Ongoing Stewardship
TLPAC	<ol style="list-style-type: none"> 1. Expand Meaningful Community Outreach 2. Solidify Partner Organizations for Ongoing Stewardship



Photo courtesy of St. Clair River BPAC member.

DISCUSSION

How Our Findings Compare to Prominent Literature

Three Previous Master's Capstones -- As our project was only possible thanks to the three previous SEAS capstone projects, it follows that many of our findings echo what each of them found. Voglesong Zejnati (2019) found that a PAC's membership composition determines the partnerships and funding opportunities available for the PAC. PACs need to translate complex technical information, help the public understand their AOC-related work, and have effective leadership to make this possible. Knauss et al. (2019) found that the most common motivations for PAC members to get involved with AOC-related work were a sense of place, environmental passion, commitment to stewardship, and professional and personal interests. They also found that the three most common themes valued about PAC member's communities were natural environment, outdoor recreational activities, and community engagement. Madden et al. (2020) found that the most prolific barrier to PAC success was communication and outreach to the broader community. They found that both the structural and human dimensions of PAC roles are essential in educating the public and cultivating local relationships to improve AOC-related efforts. Each of these previous studies underscore the importance of our findings that show community education as the number one recommendation of interest among all PACs. We found that PACs are interested in translating technical knowledge for community members, relaying their sense of purpose through mission statements, and hosting various stewardship events for the public. It is essential to understand that PAC members continuously note their desire to include the community in AOC-related work; our findings confirm those of the three previous capstones that show this to be true.

Institutional and Organizational Change -- There are many cultural and institutional necessities in creating an adaptable and durable organization. Specifically for ecosystem-based management, effective implementation of environmental restoration requires action planning within a strategic framework, systemic review and feedback, and broad-based stakeholder involvement (Hartig et al., 1998). Other studies of the entire AOC program found that the majority of AOCs practiced institutional change by strengthening connections with local organizations and expanding strategic partnerships that emphasize local capacity (Alsip et al., 2021; Hartig et al., 2020). A broad review of the entire AOC program over the last 30 years relayed the importance of ensuring meaningful public participation, establishing a compelling vision and measurable targets, building partnerships, and focusing on life after delisting (Hartig et al., 2020). Our study's results confirm these findings as many PACs were interested in broadening their partnerships and involving more community stakeholders throughout the course of AOC-related projects.

Various other studies on advisory councils and organizations more broadly have come to similar conclusions as our report on the Michigan AOC program. Advisory councils have emphasized the necessity of gaining input from and providing leadership opportunities for young community members through youth councils (Cushing & van Vliet, 2017). Citizen steering committees have also shown to be important when directly addressing community concerns to locally implement state and federal policy (Fowlie et al., 2020). Effective organizations require constant communication with external organizations via a “table” to gather around, discuss their structure and partnerships and create actionable change (Yaffee & Wondolleck, 2017). However, intangible concepts such as building personal relationships, establishing a sense of place, and sharing skillsets are essential components that complement the structural aspects of an organization (Yaffee & Wondolleck, 2017). These components provide valuable insight to our finding that PACs are interested in conducting strategic recruitment among community members with a shared sense of purpose.

Historically Underrepresented Demographics -- The environmental space in the United States has historically excluded and harmed marginalized people from underrepresented communities; few environmental organizations intentionally collaborate with groups that represent low-income or minority groups (Taylor, 2014). PAC members recognize this and wish to engage with minority and low-income communities in a more deliberate manner. Studies have shown that wealthier, whiter, and more educated communities tend to receive more project sites for environmental remediation (Taylor, 2014; Stanford et al., 2018; Mohai et al., 2009). In contrast, communities with more resources are able to receive a higher share of funding (Stanford et al., 2018; Mohai et al., 2009). PAC members discussed their interest in making deliberate efforts to engage and include disadvantaged communities in their PAC projects; stakeholder recruiting requires “carefully targeted outreach” to integrate underrepresented communities into the process (Holifield & Williams, 2019). Youth councils have been found to include more minority members than are proportional to their community’s minority population; this was found to be a deliberate effort to build an inclusive environment for aspiring young professionals (Cushing & van Vliet, 2017). In our study, several PACs indicated an interest in reaching out to the broader community to build a more inclusive environment. Additionally, our project team included many references to DEI initiatives in the implementation plans for the PACs to pursue.

Social, Economic, and Political Benefits of Environmental Restoration -- Watershed rehabilitation does much more than restore environmental beneficial uses to AOCs; it also provides social (Angradi et al., 2019), economic (Isley et al., 2018; McCoy & Morgan, 2012), and political (Guo et al., 2020) revitalization to the area. While true of environmental restoration broadly, these concepts apply specifically to the AOC program. Studies have shown that social and economic investments into restoring AOCs produce improved socioeconomic outcomes (Angradi et al., 2019) and quantitative monetary benefits (Isley et al., 2018) to affected communities. Part of this social investment involves educating the public about various aspects

of environmental restoration (McCoy & Morgan, 2012). Several studies that have surveyed Great Lakes coastline community members to understand what is most important to them found the top answers to be community education (Levine et al., 2020) and inclusive stakeholder participation (Fales et al., 2016; Seltzer et al., 2014). It is essential to give these stakeholders a platform to voice their concerns and educate those conducting restoration as well (Seltzer et al., 2014).

Several of our implementation plans included hosting town hall meetings and networking community engagement events. These findings complement these previous studies that show investments in environmental restoration provide social benefits to the impacted community; by understanding the needs of community members, PACs can more effectively institute these stakeholders into their work. While we found PAC members to have immense local and technical knowledge of their AOCs, there are several local organizations—many of which are minority-run, low-income, or Indigenous groups—with their own knowledge, insights, and priorities that should be incorporated into the PACs (Guo et al., 2020; Williams, 2015). It is important to understand that researchers, advisory councils, and government entities do not “have a monopoly on knowledge” (Collins et al., 2018). Additionally, political differences can impact progress made toward restoration in a community; this underscores the necessity to consider various viewpoints from myriad stakeholders, both individually and as an organization (Guo et al., 2020). Educational and knowledge-sharing events also present the opportunity to celebrate watershed rehabilitation accomplishments (Hartig, 2014). By creating a shared understanding of successes and difficulties, organizations can build an inclusive environment for all stakeholders to learn from one another (Williams, 2015; Hartig, 2014; Collins et al., 2018).

Collective Impact and Backbone Capacity -- In order to function as an effective organization after delisting, PACs should focus on their collective impact and necessary backbone organizational capacity. Collective impact, as defined by Kania and Kramer (2011), is “the commitment of a group of important actors from different sectors to a common agenda for solving a specific social problem” (Kania & Kramer, 2011). This involves consistent communication with external organizations, a structured process that establishes a common agenda among all participants, and secure financial resources (Kania & Kramer, 2011; Hanleybrown et al., 2012). As Vogelsong Zejnati (2019) found PACs that started as watershed councils held more public trust and community engagement due to their perceived independence and willingness to take direct action. By partnering with a diverse group of stakeholders and establishing an organization to increase backbone capacity, PACs can better connect with existing organizations, expand funding sources, improve community engagement, and build their institutional capacity in preparation for life after delisting (Egan & Loe, 2020; Turner et al., 2012; Hartig et al., 2018). Our results show that many PACs are interested in implementing recommendations relating to life after delisting; preparing for delisting now is the best way to build an adaptable backbone organization that will endure beyond the AOC program.

Common Themes Across the Michigan AOC Program

We discerned four key themes that PACs are interested in across the Michigan AOC program. PACs want to: (1) expand community education and outreach, (2) increase active recruitment of members and partnerships, (3) develop plans for transitioning into life after delisting, and (4) expand PAC organizational structures. These themes are not monolithic but rather holistic; they each intertwine and build on each other but individually offer unique areas for PAC growth. It is important to note that these state-wide themes were generated from Phase II community conversations with the PACs; they are created by the PACs and for the PACs.

Expand Community Education and Outreach -- Community education was the most common recommendation of interest for PAC members. PACs wish to engage with communities within their AOCs, so that community members know about the AOC program and the PAC's work in helping to restore beneficial uses in their local AOCs. PAC members want to educate community members to enable them to become active in local aquatic stewardship, both now and into the future. During our conversations, PAC members came up with ideas to address this, including hosting biennial open house events, developing marketing materials with education and recruitment at the forefront, and publicizing outreach, clean-up, and stewardship events. Such efforts can be leveraged as opportunities to engage with new community members, keep community members updated on their AOC's RAP progress, and discuss their PAC's plans to transition out of the AOC program into an ongoing community stewardship role.

Several PACs suggested hosting annual or biennial events. These events include three common aspects that make them successful: (1) events should be held in collaboration with partners; (2) partners should be invited to events; and (3) events should be publicized using social media. First, collaborating with partners provides PACs the opportunity to publicize their organizations and AOC-related work and allow the event to be further-reaching than if the PAC acted independently. Second, PACs discussed inviting existing and potential partners to events. These partners can be state and federal agencies, local municipalities, academics, or other stakeholders. At these events, partners can speak about their work, host an informational booth, or showcase their commitment to joint stewardship and growth. Third, PACs want to publicize events using social media. This includes advertising the event, live-tweeting or posting on Facebook/Instagram during the event, or collecting stories and taking photos at the event to post afterward. Using social media can help reach new audiences, engage people that do not attend the event, and provide a reference platform that will endure after the event.

We found during Phase I interviews that many PACs were interested in engaging with young people. PAC members then discussed several avenues to put this interest into action during Phase II conversations. For elementary school students, PAC members mentioned designing and implementing field trips, in-class visits, and connecting with after-school programs. For middle school and high school students, PAC members discussed coordinating with key community

service-based organizations such as the National Honor Society, Boy Scouts and Girl Scouts of America, Key Club International. PACs also suggested creating summer internship opportunities to engage young people who are interested in water policy and stewardship as a future career. At each level of education, PACs need to connect with partners in the education sector to build water literacy related to AOC protection and stewardship into school programs. Many colleges and universities also reside in or neighbor AOCs. These institutions are often an untapped resource for engaged and educated student volunteers and interns, as well as a potential opportunity for research collaboration. PACs see higher education institutions as opportunities for growing their network and expanding stewardship.

Increase Active Recruitment of Members and Partnerships -- PACs want to build out their recruitment of new members, partners, and active supports and stewards. Hosting networking events and engaging with youth are two main avenues discussed for achieving these goals. Through these methods, PACs have the opportunity to advertise the many ways community members can become involved with AOC-related watershed restoration. PACs discussed inviting educators from local schools to outreach events to learn more about AOCs, discover how to get involved in AOC work, and bring this knowledge back to the classroom for their students. Allowing key stakeholders to view the past successes and future endeavors for PAC stewardship can spark opportunities for collaboration and partnerships.

Another key way PACs want to build out recruitment is through marketing materials on both online and offline platforms. Materials should be educational, informative, and translatable and should include pamphlets, posters, story maps, or online posts. Additionally, PACs highlighted that materials should consist of the history of the AOC, the successes of the PAC, the current work of the PAC, and the growth opportunities. Materials must also communicate the PAC's value proposition to explain the many benefits of partnering with them. Social media has become an important tool for reaching a broader audience, emphasizing the importance of including these materials online.

Develop Plans for Transitioning into Life After Delisting -- Although PACs vary greatly on progress toward restoring beneficial uses within their AOCs, many are looking beyond delisting to become organizations that promote stewardship. Objectives regarding life after delisting in the implementation plans include cross-cutting language with other recommendations, such as expanding partnerships and memberships with life after delisting in mind. The themes here are that (1) delisting impacts all facets of PAC functioning and (2) the general need to decide how the organization will continue after formally exiting the AOC program. Regardless of where a PAC is in the BUI removal process, PACs want to develop plans to prepare for stewardship after delisting. These plans often include guidance on how the PAC will navigate education, outreach, research, and ecosystem management. Additionally, plans often focus on how PACs plan to fund

their future work outside of the AOC program when they no longer benefit from state financial support.

Expand PAC Organizational Structures -- PACs want to clarify and expand structure within their organization and set up systems to work towards their objectives. PACs expressed a desire to consistently add their objectives to PAC meeting agendas and create space to regularly discuss their priorities. Additionally, PACs discussed creating subcommittees that would focus on specific needs within the PAC. For example, throughout many of our conversations with PAC members, we heard some general confusion about how the PAC should approach life after delisting, especially with regard to PACs' organization structure and funding. To address this, many PACs discussed setting up a grant writing subcommittee or a subcommittee focused on building a concrete delisting structure, which would constitute a structural change to their organizations. PAC members also talked about developing short and long term strategic plans (e.g., preparing for delisting strategic plans and strategic recruitment plans) to address organizational ambiguity and PAC needs. Lastly, PACs talked extensively about creating spaces for discussion with each other, including topic-focused visioning sessions and spaces for consistent evaluation. PACs discussed evaluating progress at uniformed intervals and creating channels and structures for regular communication. Overall, all 10 PACs discussed new organizational structures and systems to implement to make discussion, planning, and evaluation more meaningful and effective.

Limitations and Assumptions of Our Study

The primary assumption of our research is that the opinions of interviewed PAC members represent the entire PAC's ideas and feelings. During the Phase I interview process, our team decided that our research would be most meaningful if we interviewed at least three members from each PAC and included them in Phase II community conversations. Given that the COVID-19 pandemic began in March 2020, we could not interview PAC members in person and we knew that engaging PAC members during a stressful time would be challenging. Interviewing three members from each PAC was an achievable goal that would also provide us with diverse perspectives.

A second assumption we made was that all PACs would buy into our project and use it as a tool to build their capacity and effectiveness. Early on, EGLE informed us that PAC members had enjoyed working with the previous SEAS master's capstone students. PAC members and SEAS master's students had built a connection, and PAC members were pleased to share their thoughts and opinions with these students. Even with the success of the previous three capstone research projects, PAC members showed varying interest levels in engaging with our implementation-focused project. Some PACs were excited to engage in interviews and community conversations to discuss how to strengthen their organizational structure and build capacity. Other PACs felt that their organizational capacity was already developed and that our project was somewhat

redundant. And some PACs had limited organizational capacity and struggled to engage with our work.

Additionally, our project had two primary weaknesses: limited participation by PAC members and a lack of in-person connection with PAC members due to the COVID-19 pandemic. As described above, we attempted to interview at least three PAC members from each PAC to understand what recommendations each PAC as a whole wanted to institute; two exceptions were the Clinton River PAC and the Lower Menominee CAC, as we were only able to interview two members in Phase I. In Clinton and Menominee's case, we had a few members join in on Phase II community conversations that had not taken part in Phase I interviews. Our team preferred to speak with four or five members from each PAC. Each PAC member brought diverse opinions and thinking to the discussion. Phase II community conversations often included more varied perspectives when a more significant proportion of the PAC was brainstorming how to implement recommendations together. In cases where we only had the opportunity to speak with two or three PAC members, we hoped that these PAC members would propose ideas that the entire PAC was interested in and bring the developed implementation plans back to the whole PAC. Our team felt that increased participation by PAC members was more likely to catalyze large-scale organizational growth and change simply because more PAC members were part of the discussion on how to institute this change.

Second, when our group began planning our project in January 2020, we planned to travel to the AOCs across Michigan to speak with PAC members. However, when the COVID-19 pandemic spread in March 2020, we had to redesign our project and ultimately conduct our interviews and community conversations virtually. While our team and PAC members were quick to adapt to the online format, virtual interviews are inherently less intimate than in-person conversations. Working virtually with PAC members made it even more challenging to ensure PAC engagement and buy-in on our project. Working with PAC members to develop a strategy to implement recommendations requires building trust with PAC members, listening to their needs, and helping them collaboratively chart a path forward to implement their desired objectives. While this would normally be a difficult process, making these necessary interpersonal connections virtually was even more difficult.

Broader Implications: The Implementation Gap

Within the scientific literature, there is an ongoing conversation about the significant challenge of turning research into practice; this is known as the “implementation gap.” The implementation gap is defined as the disconnect between the information and knowledge that researchers have uncovered and what practitioners know and incorporate into practice (Dubois et al., 2019; Holness et al., 2018; Toomey et al., 2016). The implementation gap is discussed in the context of health systems (Wolk & Beidas, 2018), education (Reeves, 2007; Cook & Odom, 2013), conservation sciences (Kadykalo et al., 2020; Dubois et al., 2019), and ecosystem management

and sustainability (Cash et al., 2003; Roux et al., 2006; Wiek et al., 2012; Meadow et al., 2015). Understanding the implementation gap allows researchers to realize how scientific findings fail to create usable solutions for decision-makers and practitioners and prompts us to consider effective bridging methods.

Some scholars highlight that bridging the implementation gap requires increased engagement from practitioners and outlines specific actions practitioners can take (Dubois et al., 2019). Dubois et al. (2019) state that the implementation gap creates challenges for conservation, and ineffective conservation practices can arise from delayed adoption of evidence-based approaches. Practitioners should further engage in the process of knowledge creation and transfer by applying ex-ante and ex-post learning (Dubois et al., 2019). Ex-ante learning requires collecting and gaining knowledge before a management decision is made. Ex-ante learning requires defining the right question and clarifying information needs; ex-ante learning also allows practitioners to communicate their information needs to the research community. Ex-post learning describes learning from the outcomes of a project by monitoring and evaluating the results of a management decision. Ex-post learning generates evidence about the effectiveness of a particular strategy applied within and across projects. Overall, practitioners must create and transfer knowledge by identifying and sharing relevant questions and engaging in interactive processes for knowledge creation, ultimately guiding the focus and content of future research activities (Dubois et al., 2019).

Some scholars recommend an increased effort by researchers to make their work more accessible by studying issues of more direct relevance to practitioners (Knight et al., 2008; Arlettaz et al., 2010; Kadykalo et al., 2020). Often, researchers do not express interest in or commitment to being part of the implementation process (Arlettaz et al., 2010; Smith et al., 2009) because academics are evaluated in their careers by their research performance and publications rather than by implementation outcomes (Arlettaz et al., 2010; Knight et al., 2008). To bridge the implementation gap, some scholars describe the need for researchers to change how they address this gap and choose to work alongside practitioners.

The implementation gap needs to be reevaluated and rebuilt as a space for cooperation and collaboration (Roux et al., 2006; Lauber et al., 2011). Closing the implementation gap requires not only the transfer of knowledge from researcher to practitioner, but a reimagining of this collaborative space. Presently, knowledge transfer is viewed as a process in which science and information are passed in one direction from the researcher to the practitioner (Toomey et al., 2016; Braithwaite et al., 2018); this concept is often referred to as “linear knowledge transfer.” Linear knowledge transfer assumes that research and data are the primary tools that inform practitioners. Yet, scientific evidence is just one factor that informs change, and linear knowledge transfer ignores the other factors that contribute to the decision-making process, including existing beliefs, lived experiences, and personal perspectives (Toomey et al., 2016).

Given that the implementation gap is not merely a gap that knowledge and evidence must traverse, it is best to think of this gap as a space to be filled by partnership and collaboration (Van Kerkhoff & Lebel, 2015; Toomey et al., 2016; Wondolleck & Yaffee, 2017). Research must become embedded into the “collaborative social and decision processes comprising the spaces where policy scenarios and grassroots action play-out” (Toomey et al., 2016). As Toomey et al. (2016) stated, “while synonyms for ‘gap’ include words such as ‘chasm,’ ‘discontinuity,’ ‘rift,’ or ‘breach,’ the word ‘space’ is connected with words such as ‘arena,’ ‘capacity,’ ‘leeway,’ and ‘place’ and implies multiple dimensions.” To think of the gap between research and practice as a collaborative space encourages researchers to consider the societies, cultures, identities, histories, and contexts that drive decision-makers.

Bridging the Implementation Gap Between AOC Research and Michigan PACs

The past three master’s capstones produced meaningful research describing how the Michigan AOC program can improve to continue efficiently restoring beneficial uses and building more resilient communities that understand their aquatic ecosystems. Our project used this research and collaborated with PAC members to implement the recommendations from past reports, effectively bridging the implementation gap. We worked in the space between research and practice by: (1) packaging information in an approachable manner for PAC members; (2) collaborating closely with PAC members to determine their priorities as practitioners; (3) soliciting feedback to ensure PAC members’ ownership over the final product; (4) facilitating a collaborative process between the PACs and EGLE; and (5) creating a culture for implementation. Overall, our collaborative research process should serve as a model for practitioners/researchers to bridge the implementation gap. Below, we describe each of the five actions we took to bridge the implementation gap in more detail.

First, we effectively condensed and packaged the recommendations from the previous three master’s capstones for the PACs. Throughout the Spring of 2020, we determined the key themes from each of the past three capstone reports. Each capstone researched a different element of the Michigan AOC program and the PACs, yet there was significant overlap in the three reports’ findings and recommendations. We synthesized and reduced the 24 recommendations from previous reports into a list of eight distinct recommendations that would apply to any growing and developing organization.

Second, we collaborated with PACs to understand their organizational needs and mold our project to their desired objectives. Collaboration allows researchers to hear and incorporate community members' specific priorities, which is the most effective way to guarantee that research and knowledge will become action (Minkler, 2004; Blacksher et al., 2016). Our two primary data collection methods, Phase I interviews and Phase II community conversations, were intentionally designed to determine the holistic priorities of each PAC and maximize PAC

member involvement in the research process. Our goal was to go beyond incorporating PAC input into the research process to enacting change through collaborating with PAC members. Additionally, because our project followed three previous master's capstones, a pattern of trust and collaboration had already been established between SEAS master's students and PAC members. Time is needed to build trust between researchers and community members; only with time can community members engage with research questions, research processes, and the use of data to aid in solutions and implementation (Cargo & Mercer, 2008; Blacksher et al., 2016; Wondolleck & Yaffee 2017).

Third, we solicited consistent feedback from PAC members throughout the project to check for the accuracy and clarity of our findings and to encourage them to take ownership of their PAC's implementation plans. Our team acknowledged that the implementation processes must be iterative and adaptable. After we distilled the critical objectives from Phase I interviews and created one-page theme documents, we asked PAC members to decide whether our identified themes matched what they had expressed during the interview process. Once we had drafted the implementation plans based on Phase II community conversations, we again asked for feedback from PAC members to ensure that our plans accurately captured their thoughts and ideas. We also included AOC coordinators in the feedback processes by asking them to edit and provide input on their assigned PACs' implementation plans. Since each AOC coordinator understands their PACs personally, we wanted to honor their knowledge in our work. We adjusted each plan based on feedback from PAC members and AOC coordinators. The goal of explicitly using iterative processes was to ensure that PAC members saw their ideas in their PAC's implementation plan. We understood that the PACs would not use their implementation plans unless they felt they had ownership over their product.

Fourth, we encouraged collaboration between the PACs and EGLE by serving as neutral observers and impartial facilitators of this relationship. From the beginning of our work, AOC coordinators highlighted that their role was to support PACs rather than dictate their actions. AOC coordinators are acutely aware that the AOC program is not a top-down regulatory program; PAC members have to lead the way in making the changes they want to see in their AOC. Yet, the program is designed to remove BUIs, so AOC coordinators sometimes have to impose top-down constraints. As a third party, we facilitated conversations between PAC members and AOC coordinators about enacting meaningful change. Had AOC coordinators initiated a discussion about organizational change, PAC members may have felt that EGLE did not value their work and progress. Our ability to be neutral facilitators in these processes provided an avenue for both AOC coordinators and PAC members to openly discuss organizational change.

Lastly, we helped create an implementation climate. It is essential to build an "implementation climate" that fosters individuals who are willing to adopt evidence-based practice (Ehrhart et al.,

2014; Wolk & Beidas, 2018). Multiple studies address how to create an organizational culture that supports adaptability and durability (Weinert & Mann, 2008; Damschroder et al., 2009; Braitewaite et al., 2014). These studies stress that an implementation climate must include organizational culture and structure that promotes and facilitates change. We promoted change by asking each PAC to select one or more recommendations they wanted to pursue; the expectation was that growth and change were vital for all PACs, even if they considered themselves high-functioning. Additionally, we created an implementation climate by connecting the PACs to each other and EGLE. Final implementation plans for all Michigan PACs will be available for each PAC to view how other Michigan PACs discuss implementation and change. By creating a culture that normalizes growth and implementation, EGLE and PACs can discuss their goals, aspirations, and objectives for the Michigan AOC program. By focusing on both EGLE and PACs' common goals, we produced a communication medium to bridge the implementation gap and encourage continued vertical collaboration.



Photo courtesy of RRAC member.

RECOMMENDATIONS

By interviewing PAC members and AOC coordinators, hosting community conversations, coding interviews, and writing implementation plans, our group has developed four main recommendations that we feel will strengthen PACs' organizational structure, capacity, and durability. We offer these recommendations to the 10 PACs that we worked with and to EGLE.

Include Underrepresented Communities

Throughout our interviews and community conversations with PAC members, we found that many PACs do not have a strategy to meaningfully engage underrepresented communities (e.g., young people, people of color, low-income communities, women, or other underrepresented groups) in PAC work. To address this, we first recommend that EGLE host quarterly DEI training sessions with a DEI consultant for all PAC members in the Michigan AOC program. While we understand that the AOC program grants significant liberties to PACs in conducting AOC-related work, our group believes that successful restoration will require PAC members to become DEI literate and actively apply new DEI knowledge to their AOC communities. Training should address how DEI relates to improved restoration efforts. PACs also need to understand barriers that prevent marginalized communities from engaging in AOC efforts, including language, transportation, limited time, and knowledge barriers.

Underrepresented communities may have specific priorities or interests related to AOC projects and education (e.g., a better understanding of drinking water hazards and fish toxicity, how traditional ecological knowledge can be incorporated into AOC projects, or how cultural resources can be restored at AOC sites). Facilitated training or workshops for PAC members is the necessary first step towards building DEI literacy within the AOC program and ultimately incorporating underrepresented groups' priorities into AOC work. Training should equip PAC members to ask marginalized stakeholders what kind of restoration and stewardship efforts they would like to see in their community. Getting direct input from underrepresented communities and organizations is the only way to fully understand how these communities want to be included in the AOC program, how PACs can be more inclusive, and how underrepresented communities can contribute to ongoing restoration and stewardship efforts.

Second, we recommend that each PAC creates a three-year strategic plan to increase diverse representation in their respective PACs, partner organizations, and community education activities. These plans should be created after training sessions that promote DEI literacy. Finally, we recommend that these plans are shared at SPAC meetings so that PACs can collaborate and share their ideas about how to engage underrepresented community members more meaningfully.

Build External Funding Sources

We found that many PACs do not have the capacity to gain funding from sources outside EGLE. The AOC program aims to restore beneficial uses, and EGLE funds activities and organizational capacities that contribute to this effort. Yet, many PACs want to find funding for (1) projects beyond the scope of the AOC program that will contribute to community revitalization and (2) restoration and stewardship efforts after delisting from the program.

First, PACs have many ideas for programs and projects that focus on community education, outreach, and stewardship outside of the AOC program's scope. PAC members are also becoming concerned about other environmental pollutants and hazards, including PFAS and climate change, that are not considered by the AOC program as a beneficial use impairment. PACs want to find ways to fund projects that will contribute to a restored aquatic environment and create healthier and better informed communities.

Second, PACs have built restoration programs, partnerships, and community outreach and education efforts for over 30 years. Many PACs are invested in and committed to continuing these programs and projects once all beneficial uses have been restored. Yet, PACs have primarily been funding their work through PAC support grants and are unsure whether they will find funding after their AOC is delisted. Many PACs recognize that they will need to find funding to pay at least one staff member if they want to continue their work after delisting. Given this apparent desire to find funding for diverse projects and stewardship efforts after delisting, we recommend that EGLE and PACs collaboratively build a fundraising culture into the Michigan AOC program.

To begin building a fundraising culture, we recommend that EGLE and PACs collaboratively recruit and hire skilled development staff for each PAC; development staff are defined as individuals responsible for acquiring funds to pay for general operating expenses, salaries, and programs. This may be accomplished through individual donations, grants, government or private foundations, sponsorships, or events. While PACs actively recruit members from nonprofits focused on community engagement or engineers and scientists as technical advisors, many PACs do not prioritize recruiting, marketing, and development specialists. PACs need to recruit members who can network with grantmaking organizations that can provide PACs with funding. This could entail recruiting development staff from partner organizations (Friends groups or industry partners) and leveraging their skills to raise funds. Ideally, PACs could begin to apply for and earn small grants while they are part of the AOC program and form these partnerships with grantmakers before the AOC is delisted. A skilled fundraiser also understands different organizational structures that facilitate fundraising (e.g., membership structure, endowment, or fees for service). Recruiting a development person for each PAC from a partner organization with fundraising knowledge would help PACs begin building their post-delisting organizational structure while in the AOC program.

Beyond recruitment, PACs may also need to hire administrative or development staff to lead fundraising efforts. PAC support grants should help fund these staff. While our group understands that PAC support grants should not be used for “side projects,” we believe that paying for staff and capacity-building will ultimately create an independent and financially autonomous organization. As PACs begin to develop their fundraising capacity, they can build salaries into grants and wean themselves off the need to pay their staff using PAC support grants.

We understand that there needs to be a cultural shift in the Michigan AOC program. EGLE needs to prioritize helping PACs seek and establish relationships with individuals who can successfully fundraise. PAC members need to see fundraising as a shared responsibility between them and EGLE. Collaboratively, PACs and EGLE need to strategize about how to recruit a development person for each PAC and use PAC support grants to hire and fund a part-time PAC fundraiser.

Assist PACs in Preparing for Stewardship After Delisting

Many PAC members expressed general confusion and uneasiness around delisting. From the beginning of our project, EGLE staff informed us that delisting is a stressful and turbulent process for PACs. PACs have been part of the AOC program for over 30 years and have benefited from its structure, funding, and support from AOC coordinators. AOC delisting is a significant transition that requires a conscious and deliberate effort by PAC members, community members, partners, and EGLE. PACs must decide if they want to continue stewardship and restoration efforts as a new entity, how this entity will be structured, and where funding will come from. To make this transition as smooth as possible, we recommend that EGLE provide extensive guidance around planning for life after delisting.

First, we recommend that EGLE design and circulate a survey to understand where PACs need clarity about preparing for delisting and how PACs can be supported in their preparations for delisting. Our team believes that the first step in addressing uneasiness around delisting is understanding where there are points of confusion within PACs. Second, we recommend that EGLE and PACs collaboratively produce a strategic plan for each PAC based on the survey results. This strategic plan should outline how EGLE plans to address any points of confusion for each PAC. The strategic plan should also outline specific actions that EGLE and PACs intend to take to successfully transition PACs into life after delisting. Ultimately, these strategic plans should be used to catalyze a new culture of smooth transitioning from the AOC program to autonomous organizations if PACs have a desire to continue their restoration and stewardship efforts.

Similarly, to continue a culture of PAC preparedness for stewardship after delisting, we recommend that EGLE develops a “delisting transition plan” that describes how EGLE’s role will gradually end a year after delisting. Our team’s understanding is that AOC coordinators are no longer responsible for helping their PACs once the AOC is delisted. We feel that many PACs

are fearful of this sudden drop-off of support by EGLE. We recommend that EGLE ramp its role down slowly over a year-long period to help PACs gain traction in their life after delisting situations. The ramping down plan should describe specific benchmarks of how the PAC should solidify autonomy in the first year after delisting. Ultimately, both of these recommendations are meant to create a culture where PACs are consistently preparing to delist and function as an independent organization post-delisting, and EGLE is supporting efforts that lead to PAC independence.

Lastly, we recommend that EGLE use SPAC meetings as a working space to describe and discuss the delisting process and what successful stewardship after delisting might look like. This should include providing an update on all delisted Michigan AOCs, specifically centering around continued stewardship efforts or project maintenance. EGLE should also describe the status and structure of PACs from delisted AOCs. Even if there are no PAC delisting success stories, it is essential to discuss why PACs have not successfully maintained their stewardship efforts.

Design Collaborative SPAC Meetings

While Michigan PACs have different geographies and organizational structures, they primarily have similar goals and challenges. All Michigan PACs aim to restore beneficial uses and engage community members in stewarding the AOCs' aquatic ecosystems. PAC members care about their home environment and want to see their communities heal from the legacies of environmental degradation. We recommend that EGLE restructure SPAC meetings to provide a space for PACs to collaborate and discuss: effective PAC structures, PAC recruitment tactics, meaningful community education and stewardship events, planning strategies for stewardship after delisting, and funding options for stewardship after delisting. We propose a culture change for SPAC meetings from informational to action-oriented.

SPAC meetings should include one-hour long virtual breakout sessions, each composed of various PAC members from different PACs, AOC coordinators, and other guest attendees. All PAC members and any partners, community leaders, or government officials should be invited to SPAC meetings to join these breakout sessions. Breakout sessions should provide space for PAC members to discuss ongoing interests and struggles and develop plans to address specific objectives. This includes using breakout sessions to focus on meaningful, near-term tasks that PAC members can report back on at the next SPAC meeting. Breakout sessions might also prompt PAC members to work in smaller subgroups, so every PAC member focuses on their desired objective and remains engaged for the entire hour. Breakout sessions should be a structured space for collaborative planning between PAC members and partners.

Overall, PACs often struggle with the same things (e.g., uncertainty about delisting, a desire to increase education and outreach, and a need for broader recruitment). SPAC meetings should

become an avenue for PAC members to engage in action-oriented work that develops organizational growth.

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Appendix A

2021 Team Recommendations

Final Set of Proposed Recommendations

1. **PAC Structure:** Define and implement a clear division of labor within PACs.
 - a. Define clear roles and responsibilities.
 - b. Document meeting structure.
 - c. Define and address any other structural ambiguity.
2. **PAC Champions:** Formally recognize a PAC champion in differing organizational roles/fields (i.e., SPAC meetings, community outreach, state communication, technical advisor).
3. **PAC Recruitment:** Conduct strategic recruitment for PAC membership which allows for meaningful community and organizational representation within the PAC.
4. **Partner Organizations:** Develop a network of partners that will strengthen current stewardship capacity and persist after delisting.
5. **Community Stewardship:** Incorporate community sense of place to change negative public perceptions of the water bodies and encourage community stewardship.
 - a. Host community engagement and recreation events to involve local community members (i.e., beach cleanup, kayaking, citizen science).
6. **Community Education:** Develop strategies for meaningful community outreach, develop educational and informational materials, create relationships, and engage with storytelling and local knowledge.
 - a. Organize outreach and educational events in tandem with schools, universities, municipalities, and nonprofits to cultivate higher community values of ecological health.
 - b. Cultivate a community understanding of the broader economic and social impacts of restoration.
7. **Life-After Delisting:** Strategize, prepare, and develop a vision of future organizational structure by planning for life-after delisting when exiting the AOC program.
8. **Funding for Life-After Delisting:** Build fundraising capacity from external funding sources for continued organizational capacity after delisting.

Notes. This is a condensed list that combines all previous work. We recognize that PACs may already be implementing many of these recommendations, and we want to help facilitate the continued development of this work. We would like to hear about this work to better understand your experience in implementing the recommendation. We would like to hear of any other recommendations not included in this list that the PACs are interested in working on. We acknowledge that PACs are at varying stages in their development, and we will work to meet each one at their individual starting place.

Appendix B

Interview Template

Introduction (5 minutes)

Hello, our names are [whoever is in attendance], thank you for agreeing to participate in this conversation. We are the fourth graduate research project from the University of Michigan, School for Environment and Sustainability focusing on the AOC Program. We are speaking with you to better understand what you feel would help continue to build effectiveness in your PAC, based on recommendations made by previous SEAS student groups.

Phase 1 of this project is the interview process. We will be speaking with several members of each individual Michigan PAC to get feedback on the previous student recommendations. Thank you for choosing to be part of Phase 1. The information gathered in these interviews from Phase 1 will be directly used to create the implementation plan for the Michigan AOC program in Phase 2.

Phase 2 of this project is to build a customizable implementation plan. This will be a collaborative process between the PAC spokespeople and the AOC field coordinators. We would like to reiterate that any PAC member can join in making the implementation plan by being a PAC spokesperson. Phase 2 will be completely voluntary, but we welcome as much participation as possible. The larger goal is to help create actionable change across the Michigan AOC Program based on your thoughts and desired changes.

There are no right or wrong answers to any of our questions, we are interested in your experiences and thoughts. Participation in this interview is voluntary and your decision to participate, or not participate, will not impact your relationship with the AOC program staff.

The interview should take approximately an hour and a half depending on how much information you would like to share. With your permission, we would like to record this Zoom session so we don't miss any of your comments. This allows us to be more present in the interviews and focus on the conversation taking place. After the interview, we will have someone listen to it in order to extract the data we need for the implementation plan. At the end of our project the recordings will be deleted. You may decline to answer any question or stop the interview at any time and for any reason. I will be leading this interview and [name] will be keeping time and taking notes. Are there any questions about what I have just explained?

May I begin the recording?

Begin Interview

(5 minutes) [Introduce ourselves] We are the 2021 AOC Master's Project team, my name is... .. names, concentrations, where we're from, etc.

(15 minutes) PAC Coordinator/Member: Before we begin, would you mind telling us a little about yourself?

Questions to ask everyone:

- What is your role in [the PAC they are from]?
- How did you become a part of the PAC?
- How long have you been a part of the PAC?
- What connection do you have to this water body?
- Do you have another career and if so, what?

Questions for field coordinators:

- How did you become a PAC field coordinator?
- How long have you been a PAC field coordinator?
- What connection do you have to the water body?

[10 minutes] Say: Let's move onto the recommendations from previous student projects. You may have worked with or heard about the multiple student projects to create recommendations for how to improve the Michigan AOC Program in the past. With our goal of creating actionable change in mind, we consolidated these recommendations into a shortlist to bring to you now. We recognize that each PAC may be at a different stage in the BUI removal process. Your PAC may already be implementing many of these recommendations, and we would like to help facilitate the continued development of this work if this is the case. We would like to hear about this work to better understand your experience and possible areas for growth in implementing the recommendations. We would also like to hear about any other recommendations not included in this list that the PACs are interested in working on. We acknowledge that PACs are at varying stages in their development, and we will work to meet each one at their individual starting place.

We will read the following recommendations aloud and ask several follow-up questions.

[On Zoom] We will screenshare the recommendations for all of us to reference while we read.

OR

[Audio Call-in] This would be a good time to pull up the recommendations before we begin so you can have them as a reference while we read.

1. **PAC Structure:** Define and implement a clear division of labor within PACs.
 - a. Define clear roles and responsibilities.
 - b. Document meeting structure.
 - c. Define and address any other structural ambiguity.

Example to read:

Creating a bylaws document that is accessible to all members of the PAC. In this document, members will be assigned specific roles, the tasks associated with the role, time commitments.

Structural ambiguity = any undefined aspects of the organization that would benefit from being hashed-out in the implementation

2. **PAC Champions:** Formally recognize a PAC champion in differing organizational roles/fields (i.e., SPAC meetings, community outreach, state communication, technical advisor)

Example to read:

Technical Advisor: Someone to translate complex ecological information into comprehensive and concise language for other PAC members and, subsequently, for the public.

3. **PAC Recruitment:** Conduct strategic recruitment for PAC membership which allows for meaningful community and organizational representation within the PAC.

Example to read:

Meaningful recruitment: Developing a solid foundation of members who can bring meaningful information into the PAC from their personal experience and bring knowledge gained from PAC conversations into their outside lives.

Strategic recruitment: Become involved with the community in a way that sparks interest with all members of the community i.e., table at a farmer's market, community events, or educational outreach fairs

4. **Partner Organizations:** Develop a network of partners that will strengthen current stewardship capacity and persist after delisting.

Example to read:

For example, building a partnership with local government, local NGOs, non-profits, or any other groups dedicated to strengthening community through conversation, mutual events, and a common goal recognition.

5. **Community Stewardship:** Incorporate community sense of place to change negative public perceptions of the water bodies and encourage community stewardship.
 - a. Host community engagement and recreation events to involve local community members (i.e., beach cleanup, kayaking, citizen science).

Example to read:

For example, using partnerships with local governments, local NGOs, non-profits, or any other groups

dedicated to strengthening the community through conversations, mutual events, and common goal recognition.

6. **Community Education:** Develop strategies for meaningful community outreach, develop educational and informational materials, create relationships, and engage with storytelling and local knowledge.
 - a. Organize outreach and educational events in tandem with schools, universities, municipalities, and nonprofits to cultivate higher community values of ecological health.
 - b. Cultivate a community understanding of the broader economic and social impacts of restoration.
7. **Life-After Delisting:** Strategize, prepare, and develop a vision of future organizational structure by planning for life-after delisting when exiting the AOC program.

Example to read:

For example, create a document that fully lays out the framework, goals, and mission of the group beyond the delisting process. This document could also lay out any relationships within the community that would continue after delisting and how those relationships would develop.

8. **Funding for Life-After Delisting:** Build fundraising capacity from external funding sources for continued organizational capacity after delisting.

Example to read:

For example, adding a grant/funding champion who has the experience and expertise to build an inventory of and communicate with potential funding sources outside of the PAC grant program when working on the delisting process.

[50 minutes] Say: First we would like to clear up any questions you may have about the recommendations. [Answer any questions referencing the examples]. We would now like to ask several follow-up questions based on these recommendations.

For the following questions, we would like you to answer them within the framework of unlimited funding. We recognize that funding is a common issue, we are attempting to look beyond funding now to focus on individual PACs organizational capacity and the current resources available.

1. Determine meaningful recommendations for individual PAC success

Guiding Questions for Everyone:

- 1.1 Are there any recommendations you think would not be feasible for your PAC? Why?
- 1.2 Are there any recommendations you feel your PAC has already achieved?
- 1.3 Are there any recommendations you feel your PAC is currently working on? If so, how could you continue to make progress and improve on it?

1.4 Are there any recommendations not included within our summary that your PAC has been working on?

1.5 Which recommendation(s) do you think would be most applicable and valuable to implement for your PAC? Which ones would you be interested in making an implementation plan for?

1.6 How do you think this recommendation would be received by the rest of the PAC? Do you think it would be of interest to them?

Guiding Questions for Field Coordinators:

1.1 Are there any recommendations you think would not be feasible for your PACs? Let's discuss each PAC separately. Why?

1.2 Are there any recommendations you feel your PACs have already achieved? Let's discuss each PAC separately.

1.3 Are there any recommendations you feel your PACs are currently working on? If so, how could you continue to make progress and improve on it? Let's discuss each PAC separately.

1.4 Which recommendation(s) do you think would be most applicable and valuable for each of your PACs? Let's discuss each PAC separately.

1.5 How do you think this recommendation would be received by the rest of the PACs? Do you think it would be of interest to them?

Before we start with the second set of questions, we would like to remind you that we are operating under the assumption of unlimited funding.

****MOVE TO QUESTION 3 FOR FIELD COORDINATORS****

2. Determine PAC capacity to achieve noted recommendations

Guiding Questions:

2.1 What structural aspects of your PAC do you feel are effective for implementing the recommendation of interest.

2.2 What structural aspects of your PAC do you feel could be developed further to implement the recommendation of interest?

2.3 What kind of partnerships do you have that are beneficial for implementing the recommendation of interest? For example, a partnership with a local environmental advocacy group that would assist in community outreach.

3. Determine what the PAC would need to achieve noted recommendations

Guiding Questions for Everyone:

3.1 What resources do you currently have that will aid in implementing your desired recommendation?

3.2 What support or resources do you feel like you still need?

Guiding Questions for Field Coordinators:

3.1 What resources do you believe the PACs currently have that will aid them in implementing their desired recommendations?

3.2 What support or resources do you feel like they still need? Can you help provide this?

3.3 What kinds of resources do you feel like you could provide to help PACs meet their implementation goal?

3.4 What do you feel is out of the scope of your role?

SKIP FOR FIELD COORDINATORS

[5 minutes] Debrief.

Say: Those are all the questions we have for you. Thank you so much for your thoughts. Your input is extremely valuable and we appreciate you taking the time out of your day to talk to us.

[If they notified us that they are willing to be a spokesperson] One final question, could you (PAC member) confirm that you are willing to be one of your PACs spokesperson to provide meaningful input into the implementation plan? This will likely take place in either September or October with your field coordinator. This position will be a chance for you to have meaningful input into the personalized implementation plan for action.

[respond to answer accordingly]

[If they did not indicate a willingness to be a spokesperson] One final question, would you be willing to be one of your PACs representative to provide meaningful input into the implementation plan? This will likely take place in either September or October with your field coordinator. This position will be a chance for you to provide meaningful input into the personalized implementation plan for action.

[respond to answer accordingly]

[To the spokesperson] Thank you again for your time, we look forward to future conversations. We will be reaching out sometime in August to coordinate a meeting time with you, any other spokes-members, and your field coordinator to provide input on the implementation plan. The recording will end now.

SAY TO AOC COORDINATOR

[To non-spokesperson interviewee] Thank you again for your time. Our conversation today will be extremely helpful in creating an implementation plan in the next phase of the project. The recording will end now.

TELL COORDINATORS ABOUT PHASE 2 AND ASK THEM HOW THEY SEE THEMSELVES PARTICIPATING

[End Recording].

Say: We will be sending a follow-up email that will have an anonymous survey linked to it. This survey will be completely anonymous and will be a place where you can voice any other comments you have on the interview questions or process.

Appendix C

Example of a One-Page Theme Document

Recommendations of Interest:

1. **Community Stewardship:** Incorporate community sense of place to change negative public perceptions of the water bodies and encourage community stewardship.
 - a. Host community engagement and recreation events to involve local community members (i.e., beach cleanup, kayaking, citizen science).
 2. **Funding for Life-After Delisting:** Build fundraising capacity from external funding sources for continued organizational capacity after delisting.
-

Summary:

COMMON STRENGTHS

The Clinton River Watershed Council (CRWC) is doing some great work toward furthering the goals of its PAC. First, CRWC is getting more younger people involved and setting the groundwork for a new generation of PAC leadership. This continuity is a stepping stone for better and more effective leadership in the years to come. Next, the PAC is working on community education initiatives, including an adopt-a-stream program, kayaking and hiking tours, and citizen science projects.

COMMON RECOMMENDATIONS

- Community Stewardship
- Funding for Life After Delisting

The most common recommendations we heard that the CRWC would be interested in implementing are community stewardship and funding for life after delisting. While there have been efforts to reach out to the community through education programs, there still seems to be negative perceptions about the water body. The PAC is interested in reaching out to the community to change these ideas and get more people involved in community stewardship. Additionally, the Clinton River AOC is a few years away from delisting and would like to solidify its plan for life after delisting. Securing funding for more projects and ensuring the PAC's work lives on through the CRWC are what we heard to be the main priorities.

Appendix D

Codebook for Hand-Coding

Recommendations	Definitions	Interested	Ready	Accomplished	PAC Perceptions
1. PAC Structure	Define and implement a clear division of labor within PACs; Define clear roles and responsibilities; Document meeting structure; Define and address any other structural ambiguity	1a. Yes	1c. Yes	1f. Yes	1i. Favorable
		1b. No	1d. No	1g. In Progress	
				1h. No	1j. Unfavorable
2. PAC Champions	Formally recognize a PAC champion in differing organizational roles/fields (i.e., SPAC meetings, community outreach, state communication, technical advisor)	2a. Yes	2c. Yes	2f. Yes	2i. Favorable
		2b. No	2d. No	2g. In Progress	
				2h. No	2j. Unfavorable
3. PAC Recruitment	Conduct strategic recruitment for PAC membership which allows for meaningful community and organizational representation within the PAC	3a. Yes	3c. Yes	3f. Yes	3i. Favorable
		3b. No	3d. No	3g. In Progress	
				3h. No	3j. Unfavorable
4. Partner Organizations	Develop a network of partners that will strengthen current stewardship capacity and persist after delisting	4a. Yes	4c. Yes	4f. Yes	4i. Favorable
				4g. In Progress	

		4b. No	4d. No	4h. No	4j. Unfavorable
5. Community Stewardship	Incorporate community sense of place to change negative public perceptions of the water bodies and encourage community stewardship; Host community engagement and recreation events to involve local community members (i.e., beach cleanup, kayaking, citizen science)	5a. Yes	5c. Yes	5f. Yes	5i. Favorable
		5b. No	5d. No	5g. In Progress	
				5h. No	5j. Unfavorable
6. Community Education	Develop strategies for meaningful community outreach, develop educational and informational materials, create relationships, and engage with storytelling and local knowledge; Organize outreach and educational events in tandem with schools, universities, municipalities, and nonprofits to cultivate higher community values of ecological health; Cultivate a community understanding of the broader economic and social impacts of restoration	6a. Yes	6c. Yes	6f. Yes	6i. Favorable
		6b. No	6d. No	6g. In Progress	
				6h. No	6j. Unfavorable
7. Life After Delisting	Strategize, prepare, and develop a vision of future organizational structure by planning for life-after delisting when exiting the AOC program	7a. Yes	7c. Yes	7f. Yes	7i. Favorable
		7b. No	7d. No	7g. In Progress	
				7h. No	7j. Unfavorable
8. Funding for	Build fundraising capacity from	8a. Yes	8c. Yes	8f. Yes	8i. Favorable

Life After Delisting	external funding sources for continued organizational capacity after delisting			8g. In Progress	
		8b. No	8d. No	8h. No	8j. Unfavorable

Appendix E

Phase II Guided Questions - Collaborative Discussions on Implementation

Introduction and Ground Rules (~5 mins)

We want to thank you all so much for joining us in Phase II of our project, creating an implementation plan. You all are here because you each offered some really great insight into the first phase of our project and expressed interest in contributing to this group conversation about implementation.

The role of myself and my team in this meeting is to facilitate and guide the discussion - we want the final product to be personal, impactful, and durable. We believe the best way to do this is by giving you all the space to speak openly. We recognize that we are new to the program and do not know the program as well as you all do, especially not specific PACs, so we would like to hear your stories, actively listen, and go from there.

With that in mind, we're going to begin with some introductions and then get into the recommendations you all specified as important in the previous individual interviews.

Do you have any outstanding questions?

We have ground rules for our meeting today to help create a space for a productive discussion.

Ground Rules:

- Listen respectfully and actively.
- Commit to learning, not debating.
- Avoid blame, speculation, inflammatory language.
- Criticize ideas, not individuals.
- Be aware of the time. Personally monitor how much you are speaking, and make sure that each person is getting time to speak.
- Each person should speak in response to each question.
- Are there any other ground rules anyone would like to add?

This is a verbal commitment to respecting one another and participating in this discussion as equals. Please say yes if you agree to this commitment.

Team Building Questions (~20 mins)

Note: These questions will be used as a segue into the main discussion by prompting them to think about their involvement with the PAC, PAC accomplishments, and main takeaways from Phase I.

1. Why are you involved with your PAC? (~5 mins)
 - Think about your interests, jobs, or key pivotal life moments that were the catalysts that inspired this engagement.

2. Scenario: Imagine you are time traveling. You are going to time travel back to the early 1990s to strike up a conversation with someone walking down the street. This person is a resident living within or around the AOC and they ask you what your plan is to restore the watershed-- tell them a story about the work that is about to take place. (~5 mins)
 - What are some of the prominent accomplishments the PAC has achieved before and during your involvement? These accomplishments can be scientific/technical or community-based. There is so much to be proud of, please talk about those things.
3. Why did you decide to take action by becoming involved with our project and continuing your engagement in Phase II? (~10 mins)
 - What are the major takeaways/thoughts you had from your Phase I interview you would like to further explore today?

Brief Overview of Interviews (~5 mins)

Before we go onto talking about implementation, we want to briefly review your PACs main recommendations of interests that were expressed during interviews.

Main Recommendations of Interest:

- Bullet points of their recommendations of interests with the descriptions of each recommendation

Do you have any questions about these recommendations or your PAC summary that was sent to you.

Now we want to briefly go over what recommendations of interests were mentioned by all 10 PACs during interviews..

General Themes Across PACs

Note: This sections will anonymously show themes from the other PACs

- Most valuable recommendations for implementation
 - Ex: ##% of PACs want to work on

Implementation Questions for Chosen Recommendations (~1hr 30mins)

Note: Below is a template that will need to be tailored for all eight recommendations. These current questions are specifically tailored for the life-after delisting recommendation.

Given that your PAC mentioned that you want to work on x, y, and z, we would like to go through each one and ask some guiding questions for you to talk about.

1. What have been some of the hurdles to planning for life-after-delisting?
 - a. What have you done to this point to overcome these hurdles?

2. In a perfect world, what is the ideal life-after-delisting situation?
 - a. What does success look like to you?

Setup for Questions 3: We know that each of you may come from or be representatives from different organizations, institutions, and programs. If you are not a representative from an outside organization, we are considering you a representative of the PAC itself.

3. What is your organization's role in building and implementing a life-after-delisting plan?
 - a. How could your organization leverage its strengths and capacity to build and implement a life-after-delisting plan?
 - b. *How can the state support this work? (We may or may not ask this question, depending on how the conversation is going)*
4. What is your personal role in building and implementing a life-after-delisting plan?
 - a. What are you going to do specifically?
5. In your view, what are the first steps of creating a strategy for life-after-delisting?
 - a. What needs to be done to catalyze a life-after-delisting strategy?
6. When you leave here today, what structures need to be in place so that you collectively continue to talk about life-after-delisting? In this discussion, can you please talk about short-term and long-term structures.
 - a. What are the short-term structures...ie a monthly meeting? What are the long-term structures ie. a committee, a strategic plan?
 - b. *Who specifically, will take the lead on planning short-term structures? (We may or may not ask this question, depending on how the conversation is going)*

Closing Statement (~ 1 min)

We are appreciative of you taking the time to speak with us today. This session has been valuable in starting a conversation about the recommendations of interest.

We have done this to help you create actionable change in the AOC program, centered around the changes that you all want to make. After today, you should expect to see a detailed document from us that consists of an implementation plan based on what has been said here today. This can be a baseline for how to proceed and continue to work towards your goals. This is a leaping off point. The conversation should not end there.

We hope you will continue to talk about x, y, and z. We are grateful for your commitment to making the AOC program the best it can be.