

Meeting of the Great Lakes Panel on Aquatic Nuisance Species

April 29-30, 2014
South Bend, Indiana

Meeting Summary

Tuesday, April 29, 2014

Welcoming Remarks and Call to Order

Luke Skinner, Great Lakes Panel (GLP) Chair, Minnesota Department of Natural Resources (DNR)

Eric Fischer, Indiana DNR

David Lodge, Director, University of Notre Dame Center for Aquatic Conservation

Skinner called the meeting to order. Lodge welcomed participants to the University of Notre Dame and encouraged the GLP to maintain their efforts to pursue scientifically supported decision making and a focus on issues of concern to the region. Fischer welcomed the GLP to Indiana and expressed thanks to the GLP organizers. There was a round of introductions and a quorum was confirmed. Skinner reviewed the agenda, which was approved with no changes.

Great Lakes Panel Business

Luke Skinner, Outgoing GLP Chair, Minnesota, DNR

John Navarro, Incoming GLP Chair, Ohio DNR

Erika Jensen, GLP Coordinator, Great Lakes Commission (GLC)

Jensen presented the GLP election results and thanked those that voted. The election was conducted electronically following the December 2013 GLP meeting. The Nominating Committee was appointed by the Executive Committee and was composed of Luke Skinner, Phil Moy, Kevin Irons, and Becky Cudmore. The election results were as follows:

- Panel Chair
 - John Navarro, Ohio DNR
- Panel Vice-Chair (Chair Elect)
 - Bob Wakeman, Wisconsin DNR
- Chair, Information and Education (I/E) Committee
 - Doug Jensen, Minnesota Sea Grant
- Chair, Research Coordination Committee
 - Lindsay Chadderton, The Nature Conservancy (TNC)
- Chair, Policy Coordination Committee
 - Sarah LeSage, Michigan Department of Environmental Quality (DEQ)
- At-Large Members – Newly/Re-elected (4 year term)
 - Sophie Bull, Ontario Federation of Anglers and Hunters
 - Lindsay Chadderton, TNC
 - Craig Middlebrook, St. Lawrence Seaway Development Corporation
 - Chris Weeks, North Central Regional Aquaculture Center
 - Marc Smith, National Wildlife Federation
- At-Large Members – Continuing (2 yrs. left in term)
 - Doug Jensen, Minnesota Sea Grant
 - Pat Conzemius, Wildlife Forever

One At-Large member position remains vacant. Jensen encouraged GLP members to consider any constituencies that are not represented that would be a good candidate to fill the open position.

ACTION ITEM: GLP members should consider any constituencies that are not represented to fill the open At-Large Member position and make nominations during the next election.

Jensen noted several GLP membership changes and reminded GLP members that new representatives serving on the GLP require a formal letter of appointment from their affiliated agency. The membership changes include the following:

- U.S. Geological Survey (USGS)
 - New member: Patrick Kocovsky
 - Alternate: Don Schloesser
- National Oceanic and Atmospheric Administration
 - New member: Felix Martinez
- Ohio Sea Grant
 - New alternate for Ohio: Tory Gabriel, Ohio Sea Grant

All elected officers and members were installed. Navarro thanked Skinner for his dedication and commitment as GLP chair. Skinner was presented with a framed photograph to commemorate his service. Skinner thanked the GLP, and specifically Navarro and Jensen for their assistance during his professional transition.

Following this, Phil Moy, Wisconsin Sea Grant, announced his retirement and relocation to the west coast. He expressed his enjoyment in serving as GLP Chair and Chair of the Research Coordination Committee, as well as from major projects such as identifying priority species and working on ballast water issues. He encouraged the GLP to continue working to make a difference in invasive species issues.

As the new GLP Chair, Navarro expressed his desire to help the GLP continue moving forward and making a difference. He shared his confidence that the GLP can help move the Great Lakes and Mississippi River Interbasin Study (GLMRIS) forward. He discussed his desire to have closer ties with other panels, especially the Mississippi River Basin Panel (MRBP), and his desire for a joint meeting with that panel in the future.

The December 2013 meeting summary was reviewed. It was approved after making the following change: Page 10, “Emerging Issues and Announcements” – change “Doug Jensen noted that the Communication and Outreach Committee of the ANSTF [Aquatic Nuisance Species Task Force] was being reconstituted and that was asked to serve as a member.” to “Doug Jensen noted that the Communication and Outreach Committee of the ANSTF was being reconstituted and that he was asked to be the co-chair.”

Jensen reviewed key action items from the December meeting, noting that more detail on committee action items would be provided during committee meetings and reports:

Executive Committee

- Spring 2014 meeting: *Staff and the Executive Committee completed planning for the meeting.*
- GLMRIS: *Staff will work with the Executive Committee to coordinate any GLP activities that may be planned following the release of the GLMRIS report in January 2014. This resulted in planning a plenary and discussion session at the spring meeting on this topic.*
- Grass carp priorities and recommendations: *The Executive Committee will continue discussions with the MRBP about possible joint recommendations based on work being done within both panels. GLP members will be invited to call in to the MRBP meeting in July 2014 to get an update on the triploid certification program review. Staff will distribute the grass and black carp collection protocols. This coordination is ongoing.*
- Great Lakes Water Quality Agreement (GLWQA) Annex 6 Subcommittee: *The Executive Committee and staff will continue to coordinate with the GLWQA Subcommittee co-chairs, with the GLP Chair and Vice Chair participating as subcommittee members. Other GLP members interested in assisting with the GLWQA Subcommittee should contact the GLP Chair and the Subcommittee co-chairs (Gavin Christie and Todd Turner). This coordination is ongoing. An update on the GLWQA Subcommittee will be provided on the second day of the meeting.*

Nominating Committee / GLP Elections

- Prepare list of nominees: *The Nominating Committee, in consultation with the Executive Committee, developed a list of candidates eligible for election for the position of, Vice-Chair (Chair elect) as well a slate of those interested and eligible to chair the three standing committees and a list of candidates for at-large membership of the GLP.*
- Conduct elections: *Staff prepared and distributed a ballot based on input from the Nominating Committee. Newly elected officers and at-large members were announced and installed at the beginning of the meeting.*

Information/Education Committee

- Recreational, water garden and classroom guidelines: When available from the Aquatic Nuisance Species Task Force (ANSTF), distribute final guidelines to GLP members for their use and distribution and post to the GLP website. [Guidelines were subsequently published in June 2014]
- Assessment of outreach activities: Working with the GLWQA Annex 6 Subcommittee co-chairs, craft a request to GLP members and interested parties to provide information about existing outreach products and evaluations to inform GLWQA subcommittee efforts. *This is ongoing.*
- Grass carp: A subgroup of interested committee members was convened via conference call to consider grass carp related outreach needs and priorities. *Work on this is ongoing.*
- Lake Superior Aquatic Invasive Species (AIS) Guide: *Committee members reviewed and provided input to OFAH on the draft Lakes Superior AIS Guide. More information on the status was provided at committee.*

Research Coordination Committee

- Grass carp priorities and recommendations: Finalize research recommendations and priorities for grass carp and incorporate them into the research priorities document. *This is ongoing.*
- Priority species list: Developing clear, objective criteria for why a species makes the priority list; define an imminent invader (Tier 1); harmonize with existing lists; and identify the subset of species with high priority regional research needs. *Work on the priority species list is ongoing.*
- GLMRIS: *Discussion will be held at the committee level regarding the GLMRIS report to identify research priorities with a focus on research needs for the most promising identified options.*

Policy Coordination Committee

- Policy priorities document: *The final document was submitted to the ANSTF.*
- Grass carp priorities and recommendations: Revise management recommendations as discussed at the December meeting; review results of triploid certification program review being conducted by the MRBP before finalizing recommendations. *This is ongoing.*
 - Consider opportunities for improving risk screening processes using species-specific risk assessment models for aquaculture and incorporate those into the recommendations and/or the policy priorities document.

Jensen noted that the GLP website was recently moved and updated due to an update of the GLC website where it is hosted. The new website is now available at <http://glc.org/projects/invasive/panel/>. GLP members should send comments or suggestions about the new website to ejensen@glc.org.

ACTION ITEM: GLP Members are encouraged to review the new website and provide feedback to Erika.

GLMRIS and next steps for the Chicago Area Waterway System (CAWS)

Moderator: John Navarro, Ohio DNR

Navarro introduced the purpose of the session and the speakers. He identified the goal of sharing perspectives from different organizations to identify differences, common ground, and a path forward.

GLMRIS – Update and Aquatic Nuisance Species Control Efforts

Dave Wethington, GLMRIS Program Manager, U.S. Army Corps of Engineers (ACE)

Wethington noted that the scope of GLMRIS was to study options and technologies available to prevent the interbasin transfer of invasive species, and mitigate adverse impacts to waterway uses. In 2012, intervening legislation asked the ACE to focus on the CAWS, evaluate hydrologic separation, and finish in 18 months. CAWS was the focus because it is the only location where invasive species could transfer between the two basins through continuously open waterways. Other connections are of lower risk because they require significant precipitation events with flooding. Some waterway pathways are perennial, but these could be managed more easily than CAWS. A 25-page summary is available in booklet form, and the entire GLMRIS report is available at <http://glmris.anl.gov/>.

The report includes eight alternatives. Sustained activities involve no new federal action and represent the activities that are currently ongoing, such as the electric barriers. Several nonstructural measures are proposed as best management practices. These controls can be implemented without physical structures and include fishing out carp, applying aquatic

herbicide, conducting education and outreach efforts, implementing new laws, and other activities that can reduce or delay the risk of transfer. Technology alternatives include flushing locks and treatment technologies such as ANS treatment plants. Hydrologic separation alternatives could be lakefront or mid-system. Hybrid options combine physical barriers and technologies to optimize effects. Alternatives three through eight impact existing uses, including navigation, water conveyance and quality, and flood risk management. These adverse impacts may need to be compensated.

The GLMRIS report was released in January 2014. The ACE worked to disseminate it, visiting eleven cities to host public meetings, and meeting with all eight Great Lakes state agencies. Over 1,500 individual comments were submitted, along with over 3,900 as part of a Sierra Club campaign. Comments are currently being summarized and should be released in the first week of May. A number of themes were identified during public meetings including a strong desire for protecting the Great Lakes, concern focused on bighead and silver carp, a call for immediate action, and support for physical separation. There were also concerns about recreation and commercial cargo navigation because of the significance of the waterway economy in Chicago, northwest Indiana, New Orleans, and St. Louis. Some public feedback included technical concerns about assumptions in GLMRIS, including the need for flood risk mitigation to the 500 year level and concerns about water quality mitigation needs. These assumptions were determined by working with federal and state Environmental Protection Agencies (EPAs). This conceptual-level report was designed to about 5% and can be refined as necessary. Stakeholders called for continuing near-term actions, such as carp harvesting efforts by states, commercial uses of carp, and continuing to operate the electric barriers, as well as interim measures including further research on Brandon Road Lock and Dam (BRLD). However, some stakeholders are concerned that interim measures might overshadow the long-term goals of ecological or physical separation.

Existing activities carried out by the ACE include operating and maintaining three electric barriers and constructing a new barrier system that should be complete by late 2016. ACE is also continuing research on weaknesses in the electric barrier system, as well as monitoring to determine the locations of adult carp populations. The adult population front has not moved in the past 10 years; there are approximately 130 miles between small Asian carp populations and the barrier systems. Wethington noted that the ACE is supporting research conducted by the USGS studying carbon dioxide as a potential fish deterrent. It is necessary to understand the effects on fish and the impacts on the aquatic environment and the concrete navigation structures. They are also collaborating with the U.S. Navy to study electrical control for species that attach to the hulls of vessels. Wethington emphasized that AIS control is a shared responsibility. Studying water use needs and impacts of management options is bigger than the federal government. Members of the public have a vested interest in preventing the transfer of AIS. Even if there is no ability of species to transfer through the waterway, there is always a risk that they could be moved by humans.

The ACE is currently waiting for direction to move forward from the administration or Congress. Others will need to help provide a consensus toward a path forward. Several topics need additional research, including flushing locks and engineered channels that would allow deterrents or new technology to be implemented. ACE may collaborate with local, state, and federal agencies to implement nonstructural controls (GLMRIS Alternative 2).

BRLD is the pinch point for the waterways that lead into the Great Lakes, before they reach five additional connections to Lake Michigan. This is a potential control point for species moving from the Mississippi River basin to the Great Lakes basin. It might be an opportunity for staged implementation, depending on the long-term control strategy.

Wethington was asked how “justification” is determined under the authority given to the Secretary of the ACE under the Moving Ahead for Progress in the 21st Century Act (MAP-21) to move forward with one or more alternatives to the preconstruction engineering and design. Wethington responded that the ACE uses a deliberative process that involved a decision document being reviewed, considering environmental compliance, and conducting engineering design in greater detail than GLMRIS. At this point it is beyond the ACE to make that decision on their own. They are currently looking for nonfederal sponsors willing to help invest along with the federal government.

Mike Hoff, U.S. Fish and Wildlife Service (FWS), noted that registration packets are being prepared that will be submitted to the EPA for several technologies. They are hoping to have a registration packet soon for using carbon dioxide technology near BRLD. Wethington added that they are hoping to help with the process by determining efficiencies and researching the possible effects on the ACE facilities. Currently, they hesitate to use carbon dioxide technology in the lock structure because of the possible long term effects.

Envisioning the future of the CAWS

Tim Eder, Executive Director, GLC

Eder began his presentation noting that many of the GLC's activities have been in conjunction with the Great Lakes and St. Lawrence Cities Initiative (GLSLC). A resolution passed by the GLC members on March 5, 2014, was made available in the meeting materials folder.

The Restoring the Natural Divide (RND) study (available at <http://projects.glc.org/caws/>), spearheaded by the GLC and the Great Lakes and St. Lawrence Cities Initiative, was initiated in 2010, and released in 2012. A resolution adopted by the Great Lakes states, recognizing that the preferred long term solution was ecological separation initiated the project. The resolution recognized that separation cannot happen in the short term, and any solution must address water quality issues, transportation needs, and stormwater protection. This project was funded with \$2 million from six foundations. Two engineering firms worked with input from an advisory committee of stakeholders from the greater Chicago area and the Great Lakes region. The intent was to demonstrate the feasibility of physically separating the waterway. This project emphasized the importance of preventing the transfer of all AIS between both watersheds while also improving water quality, flood protection, and commercial transportation.

RND identifies three alternatives for where and how physical separation could take place. Several advantages in the mid-system alternative make it the most feasible and cost effective. It protects the majority of existing stormwater outlets to Lake Michigan and minimizes transportation and recreational tour boat impacts by moving the barrier away from the lake. It involves limited wastewater treatment and sediment requirements, though the Northside wastewater treatment plant (WWTP) would need to be improved. The timeline for this project is dependent on the underground tunnel and reservoir project known as TARP. This alternative would prevent the free movement of vessels down the Cal-Sag Channel; however this is addressed by a multi-modal terminal allowing cargo to be moved from one side of the terminal to the other. Only barges going to locations like the local steel mills would be affected, because many barges coming up the waterway stop prior to this point. This terminal was designed with existing technology in mind. It could be designed to improve transportation by capturing container traffic, although significant investment in the terminals and loading facilities would be necessary. The cost of the physical barriers is relatively low; most of the cost of separation is for flood protection, water quality, and transportation mitigations.

There is a significant difference in the implementation timeline between RND and the GLMRIS report. RND indicates that a one-way barrier to protect the Great Lakes could be in place by 2022. This project is expensive, but benefits include avoiding the potentially significant costs associated with AIS impacts if invasions are prevented. There are also benefits associated with new cargo potential and better intermodal connections, expanded recreation and increased property values from water quality improvements, reduced flooding damage, and the addition of 2,900 to 7,500 jobs per year.

When GLMRIS came out, GLC had their RND engineering team evaluate and critique the report. They noted that the report recognizes that hydrologic separation is the most effective method of preventing the transfer of AIS, and the technologies identified are valuable. However, some assumptions drove up the costs of the project and the implementation timeline including assuming that no water would be discharged to Lake Michigan and all stormwater and wastewater would all be discharged downstream to the Illinois River system. This was done to meet the Clean Water Act requirements for anti-degradation of Lake Michigan. However RND shows that these requirements can be met even with allowing some discharge to the Great Lakes. Other cities discharge to the Great Lakes and meet water quality standards. Another assumption was to design alternatives to provide stormwater protection for a 500-year storm. This is a high bar to meet, and the result requires the TARP system to be double the size of what is currently proposed. Contaminated sediments are considered a challenge in GLMRIS, however RND did not include the cost of contaminated sediments because they have not been characterized to identify whether they need to be capped, removed, or otherwise managed. These sediments need to be managed regardless of separation and should not be assumed as a \$2 million cost of separation.

GLC developed a policy resolution that was signed by all eight states and two provinces, which is consistent with the 6-point strategy of the CAWS Advisory Committee. The key provisions include the following:

- Continue current Asian carp control strategies and implement additional control measures
- Implement near-term control measures at BRLD
- Design and test GLMRIS lock as demonstration project
- Develop long-term solutions with input from Advisory Committee
- Prevent fish movement caused by commercial shipping
- Study commercial transportation in the CAWS

- Discuss financing approaches for AIS control, including cost-sharing partnerships

GLC began with the statement that separation is the best long-term solution. Moving forward and working towards consensus, GLC is open to evaluating all options as a consensus emerges. GLC is not stepping away from full separation, but will consider other options. In addition, the states have a shared interest and responsibility for preventing AIS and there is a possible discussion to be had about sharing these costs. Regarding near-term measures, GLC's engineering team recommended action be taken at the BRLD instead of the Lockport Lock and Dam – because it is downstream of and would provide protection for the Des Plaines River. An engineered channel could be created downstream from the lock and dam and serve as a national demonstration site for the technologies potentially useable elsewhere.

After a question regarding the recently announced Mutual Aid Agreement for Combating Aquatic Invasive Species Threats to the Great Lakes – St. Lawrence River Basin, it was explained that the states and provinces have agreed to work together and pool resources, but the CAWS was not specifically addressed. It is significant that they have had a conversation about contributing pooling resources. While physical separation is an expensive proposition, there are significant arguments for protecting the entire region.

A question was raised about a timeline for near-term solutions. Because the alternatives have not been refined, it is hard to determine a timetable. It will take direction from Congress before the ACE moves forward with those steps. Senators Stabenow and Levin, along with the Great Lakes Delegation are taking leadership on these issues. Congressman Camp is retiring, but will hopefully pass the torch to someone else on the Michigan delegation.

Asian Carp Control Technology Development and Potential Applications

Rip Shively, Director, Columbia Environmental Research Center, USGS

USGS carp-related research began in the early 2000's, and in 2009-10, they began a more concerted effort with regard to researching and developing tools to control or remove carp. Their focus has been on using an integrated pest management (IPM) approach that could also be applied to other species or other locations. The four-pronged research approach is:

- Understanding Life History and Behavior
- Understanding Hydrologic Requirements
- Early Detection
- Control Technologies

One example of a new technology USGS is evaluating is the watergun. In pond studies, the operation of the watergun changed the distribution of fish during and after firing. Technology like this could be valuable as an alternative control strategy in conjunction with other methods. USGS partnered with Illinois DNR and Southern Illinois University to conduct IPM experiments in the Illinois River. They used algal attractants to lure carp to a location, waterguns to create barriers and move carp, and commercial fishing to deplete the population. Waterguns work by sending a pulse of pressure through the water. This creates a pressure wave and a sound that serves as a barrier. Waterguns reduced large fish to a distance of 25 meters and altered distribution of large fish to a distance of 600 meters. Some native fish mortality was witnessed, predominantly gizzard shad. In 2014, USGS plans to continue IPM trials and look at deployment locations. They will collaborate with ACE to conduct structural tests at BRLD to measure the seismic activity of the watergun that is transmitted to the concrete structures. They will also assess the impact of watergun use on native mussels.

A second technology being researched is carbon dioxide gas as a barrier chemical. Receptors on fish's gills cause them to avoid it. It is not a bubble curtain or a hypoxic response and there is no significant change in pH. The response to carbon dioxide does not appear to be species-specific. USGS partnered with the University of Illinois and the Illinois DNR to conduct lab and pond experiments to assess the carbon dioxide avoidance response. All studies showed avoidance. Carbon dioxide can provide an alternate or redundant barrier system. USGS is working with the EPA and FWS to register this tool. If it is classified as a pesticide, it may require Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) registration. Also in 2014, USGS plans to complete a large-scale field evaluation of IPM with a carbon dioxide barrier to deter Asian carp, work with the ACE to determine the feasibility of using carbon dioxide in or near the lock chambers, initiate the registration process with the EPA, and address concerns about potential impacts on other species.

A third technology is the use of food stimuli as an attractant for Asian carp to increase the effectiveness control efforts. USGS is studying behavioral attraction to algal food stimuli. Field studies are being conducted on the Missouri River to research the effects on wild fish, including the magnitude and duration of attraction. The attractant they use seems to be

relatively species-specific and USGS is working to develop protocols for effective application. USGS is also studying the impact of ambient algal communities and conducting a chemical analysis of algal stimuli.

USGS is also researching the possibility of using microparticles laced with antimycin as a species specific management tool. The particles are made to match Asian carp preferred food size so they are selectively taken up by them. The particles are made to be released in the intestines of the fish, where they are most effective. Field testing of microparticles should happen this spring and summer, and microparticles should be available 18-24 months after final formulation. Currently the technology needs to be registered, and leeching issues need to be resolved. Eugenol is also being studied as a method for decreasing net avoidance. Finally, a study in conjunction with the University of Minnesota, Duluth, was conducted to examine the possibility of using sound in addition to carbon dioxide or water guns. Redundant systems could possibly reduce the propagule pressure.

A question was raised about a carp die-off in Kentucky. USGS was aware of it, and is working with local biologists to get specimens to the Fish Health Lab to determine the cause of death. Australian researchers are looking at a koi herpes virus as a potential control strategy. It is not uncommon for large planktivores to have a large die-off after a hard winter.

GLP Discussion: GLMRIS and next steps for the CAWS

Moderator: John Navarro, Ohio DNR

Introduction

Phil Moy, Wisconsin Sea Grant

Moy provided an introduction to the discussion questions and encouraged members to think beyond just Asian carp to consider all invasive species. He emphasized that full physical separation is the most effective long term solution and reiterated that the issue has come a long way from past discussions. Moy emphasized that a harmonized message coming from Great Lakes agencies, states, and citizens needs to be taken to Congress to move the ACE toward action by providing authorization and funding. He reiterated that GLMRIS is a starting point, but not the boundary of what is available. The purpose of this discussion was to find common ground, determine next steps, and determine the GLP's role.

Comments from GLP Members

Matt O'Hara, Illinois DNR

O'Hara shared that the Illinois DNR provided official comments to the ACE. These comments generally supported GLMRIS and lowering the risk of ANS between basins. They encourage the ACE to explore these options for further design. Their comments, that are available publically, include an appendix that addresses some of the assumptions and impacts to Illinois with regards to cost estimates and cost sharing opportunities involved in the report. Many questions need to be answered with further study of the different alternatives. The Illinois DNR recommends the nonstructural measures outlined in GLMRIS Alternatives 1 and 2 as well as additional study to compliment the GLMRIS report. Another appendix to their comments includes a list of specific questions the GLMRIS report did not include. Overall, Illinois is in support of reviewing the alternatives, including follow up at BRLD, and investigation of the technologies that could be employed there as control measures for Asian carp.

Eric Fischer, Indiana DNR

Fischer explained that the Indiana DNR, the Indiana Department of Environmental Management, and the Ports of Indiana submitted a joint comment to the ACE. They were very supportive of the ACE and were pleased with the efforts. They expressed concerns with the timeline, particularly Alternatives 3-8. They support immediate federal funding for nonstructural control technologies. They also want to maintain marine transportation that hosts 18,000 jobs and has a \$1 billion economic impact. They feel that closing the connection entirely is unacceptable. They want to protect water quality, and feel that many of the proposed alternatives would have lasting effects on the water quality in Indiana. The alternatives should be explored with input from all the stakeholders. Additionally, construction started after the feasibility study must be broken down and funded through discrete smaller projects that could be accomplished faster and with more accountability.

Roger Eberhardt, Michigan DEQ, Office of the Great Lakes

Eberhardt noted that the DNR, DEQ, and the Department of Agricultural and Rural Development co-signed a letter with suggestions that mirror the GLC recommendations. The Michigan Attorney General wrote a separate letter. In the joint agency letter, key points include strong support for hydrological separation and a belief that 25 years is too long of a time frame for implementation. They also support current ongoing efforts, such as surveillance. They support funding the FWS to provide important leadership to manage broader Asian carp issues, including black carp. Additionally, they feel that BRLD options are reasonable interim options that should be put in place as soon as possible. They want to see investigations into options that allow both trade and full hydrological separation, like those outlined in RND. They want long-term hydrological separation to prevent all species from moving between basins. The letter contains specific questions raised in reaction to GLMRIS. All three directors have talked to the Michigan Congressional delegation emphasizing the importance of this work and calling for authorization of the ACE to move ahead as quickly as possible.

Dave Hamilton, TNC

Hamilton expressed concern that the risk of movement of ANS is high and the 25-year timeframe is too long. He used the example of zebra mussels moving from Lake St. Clair throughout the continent in the past 25 years. The threat of invasive species is strong and all species should be stopped from moving in both directions through the CAWS. Actions should be taken now to reduce the risk. TNC wants to see design criteria used that are reasonable, which could be different from those in GLMRIS. The stakeholder advisory group convened by the GLC and GLSLC is essential, and there must be agreement among the major interests. If there is agreement from that group that something could be done in the short-term, the Great Lakes delegates would support it. TNC included concepts that are acceptable to a broad stakeholder group, including a combination of strategically placed barriers and a chemical treatment in locks. More work needs to be done to move from the conceptual to the engineering design phase. Short term action in three to four years will make a significant difference, and more can be done later. At this point the discussion should be staged to agree on what to do now and then continue working on long term solutions that need more agreement in the future.

Discussion

Navarro guided the discussion by asking how the GLP can move forward. He recognized that each organization is in a different situation, but that the GLP members should be able to move forward with consensus on some topics. There are some immediate strategies that can be moved forward, although long-term solutions may be more difficult to address. It might be possible to look at a staged process. Many people are focusing on the BRLD, where immediate and mid-term solutions are possible. Navarro recognized that the GLP can provide input to federal agencies through ANTSF and that some GLP members and their agencies can communicate directly with Congress.

ACTION ITEM: The Executive Committee will report to the ANTSF on GLP discussions. GLP committees should consider whether to develop formal recommendations.

Members addressed uncertainty around the possibility of Asian carp in the Des Plaines River. Environmental DNA (eDNA) has been detected, but no fish have been caught. BRLD is a focus area for Asian carp management, but may not be a good application point for management if carp are already upstream. If no carp are upstream, BRLD would also provide protection to the Des Plaines River. Others shared concerns about native species being impacted by activities at the BRLD.

It was explained that it is currently impossible to make BRLD a two-way control point. Several members agreed that the GLP should consider other invasive species beyond fish, and that other connections in the upper canal system will require different management from BRLD. They also agreed that two-way control is important for protecting both the Mississippi River basin and the Great Lakes basin.

One member asked if there has been any evaluation of the relative effectiveness of nonstructural controls as compared to structural controls. He noted that many people assume structural controls are better, but nonstructural controls applied vigorously could also be good. Another member answered that nonstructural controls have a higher level of uncertainty in their effectiveness. An additional challenge of nonstructural management is identifying active management technologies for invasives different from fish, such as algae. Structural controls can more certainly reduce the risk, but should be used in conjunction with nonstructural best management practices. It was also noted that to meet the objective of protecting both watersheds, it is unlikely anything other than structural controls could be effective, especially for all species. However, as a risk reduction measure in the short term, nonstructural measures are important. Another member brought up the danger of focusing on one method to the exclusion of the other, particularly in the near-term. A member brought up the importance of monitoring the effectiveness of all measures, along with building in redundancy to mitigate failure.

The discussion was then directed back towards determining a general consensus. The GLP was able to affirm the following statement: “Is there agreement that more action needs to be taken to address the CAWS connection than is currently being implemented?”

In an effort to determine if more action is needed, what those actions are, and what is needed to move forward to implement them, the question of who should lead the regional discussion was raised. Several entities were offered as options including the GLC convened Advisory Committee, the Asian Carp Regional Coordinating Committee (ACRCC) which has state and federal agency representatives, the executive steering committee of GLMRIS, and the National Invasive Species Advisory Committee. It was expressed that stakeholder groups must be consulted, and that it would be helpful to bring in a facilitator. It was stated that it would be beneficial to have a non-governmental organization lead the discussion, since groups like the ACRCC might be limited because it is chaired by a federal organization. It was suggested that the ACRCC might be able to move forward with some technical aspects and allocation of resources.

It was also suggested that the Mississippi Interstate Cooperative Resource Association (MICRA) might be able to take the lead, or should at least be involved in the conversation. Several species in the Great Lakes basin are potential threats to the Mississippi River basin. It was noted that MICRA meets with Congressional delegations during Great Lakes Week, and that a joint meeting with GLC, MICRA, and Congress would send a powerful message. It was suggested to have a joint panel meeting between the GLP and the MRBP to help coordinate a conversation, and noted that, because of differing schedules, it would be at least ten months before a joint meeting would be possible.

ACTION ITEM: Staff will work with the Executive Committee to pursue a joint panel meeting with the MRBP in the future.

It was noted that both panels are responsible for providing recommendations to the ANSTF. As one example, the research subcommittee could look at the questions raised in the GLMRIS comments and direct those to the ANSTF. Wethington noted that the ACE is willing to talk with any state to directly answer their questions. There will be no written responses in the near future due to ongoing litigation, but it is an option to sit down for a conversation about the questions.

It was noted that the ACE cannot move forward without authorization from Congress, and the GLMRIS comments highlighted the differences among state opinions. Some say “absolutely no” or “absolutely yes” with regards to hydrologic separation. Coming to consensus among these differing opinions will be a challenge. It was countered that there is a strong desire to see additional action, to encourage federal agencies to move forward on short-term activities to provide one-way protection at BRLD or elsewhere, and to continue working toward consensus on long-term solutions. These ideas could be fleshed out and presented to the ANSTF.

Wednesday April 30, 2014

GLWQA Annex 6 (AIS) Subcommittee Update: Early Detection & Rapid Response (EDRR) Tasks *Gavin Christie, Department of Fisheries and Oceans Canada*

Christie began by providing background information on Annex 6, explaining that the Annex coordinates with the GLP for support by, for example, leveraging Annex meetings with GLP Meeting. He reiterated that the purpose of Annex 6 is to implement binational strategies to prevent the introduction of, control, and reduce the spread of invasive species, and work toward eradicating invasive species already present in the Great Lakes basin. The Annex 6 subcommittee has identified a near-term priority to develop and implement an EDRR initiative by 2015, that coordinates effective domestic and binational responses to prevent AIS from becoming established in the Great Lakes. Christie updated the GLP on the status of Annex 6 work plan tasks. The first item is the binational response plan. This plan is a pilot approach developed through GLRI and the International Joint Commission (IJC). He noted that Michigan and Ontario’s response plans will help fill information gaps in the binational plan. The next step will be to conduct workshops and exercises such as the one taking place May 21-22, 2014, in the Huron-Erie Corridor. The Huron-Erie Corridor is multi-jurisdictional, high-risk area. The exercise will explore an incident command and planning process for potential incidents in the future. Christie also showed areas of coordination across the GLWQA’s ten annexes. Annex 6 collaborates most closely with Annex 5 (discharges from vessels) and Annex 7 (habitat and species). Most recently, Annex 6 will be working with Annex 10 (science) to identify science priorities for AIS. The subcommittee is requesting the assistance of the GLP Research Coordination Committee in identifying those priorities.

ACTION ITEM: The GLP Research Coordination Committee will provide input to the Annex 6 subcommittee on identifying the top three science priorities for AIS in the region.

Progress on AIS Surveillance and Response

Moderator: Lindsay Chadderton, TNC

Interstate EDRR Plan

Sarah LeSage, Michigan DEQ

This project is a joint effort between the Great Lakes states. The project was crafted based on the priorities outlined in the Great Lakes Restoration Initiative (GLRI). The GLRI Action Plan Invasive Species Focus Area has identified one long term goal as, "A comprehensive program for detection and tracking newly identified invasive species in the Great Lakes is developed and provides up to date critical information needed by decision makers for evaluating potential rapid response actions." Although a preliminary proposal has been submitted to FWS by Michigan with letters of commitment from the other states, the project has yet to be funded. LeSage presented an action plan if the project is funded.

The initial timeline for the project is one year, starting in the fall of 2014. The geographic scope includes the Great Lakes and connecting channels and tributaries up to the first barrier. This project would result in a plan for coordinated surveillance efforts to be implemented in 2016. The outputs from the project would include a comprehensive surveillance program, a multi-agency response plan, and an inter-jurisdictional mock exercise. The key steps to reach the output goals are the following: (1) establish a Great Lakes EDRR plan planning team, (2) hire consultants, (3) develop a surveillance plan using a strategic planning process, (4) develop a multiagency rapid response plan, and (5) conduct at least one inter-jurisdictional rapid response exercise. Consultants would be hired to synthesize efforts, and identify gaps in and capacity for surveillance.

Interstate EDRR Plan

Tim Strakosh, U.S. FWS

In his presentation on AIS Early Detection and Monitoring Program in the Great Lakes, Strakosh focused on the expanding eDNA program, which includes a Quality Assurance Project Plan (QAPP). He showed priority areas in the basin for this eDNA surveillance, ranking them from high to medium for each lake as well as the Chicago area waterway system, Ohio River, and Upper Mississippi River. The sites for the eDNA study were recently finalized at a partner meeting on April 16, 2014. The majority of sites are located in western Lake Erie, the Huron-Erie Corridor, Lake Michigan, and one site at the Port of Duluth in western Lake Superior. In total, 1700 samples will be collected in 2014. For results of the 2013 and 2014 sampling visit: <http://www.fws.gov/midwest/fisheries/eDNA.html>.

Update on Great Lakes surveillance sampling plans, design and methods development

Chris Jerde, University of Notre Dame

Jerde presented on eDNA surveillance in the Great Lakes. He began by explaining a part of the study that included evaluating bait trade as a pathway for invasive species. During 2012-2013, the team tested bait shop locations in all the Great Lakes states. Positive detections of eDNA for invasive species were found in bait shops on the western edge of Lake Erie in Michigan and Ohio as well as the southern tip of Lake Michigan in Indiana and Illinois. Twenty-seven positive results were detected out of 576 total samples.

He next presented on methodology and calibration. The team looked at ten experimental ponds; one pond with Polymerase chain reaction (PCR) detection and one pond without the technology. The study found a positive correlation between fish mass density and the presence of Asian carp DNA. He offered three recommendations: (1) Laboratories conducting eDNA research should separate eDNA extraction and PCR amplifications, (2) increase sensitivity of Asian carp detection using the quantitative PCR assay, and (3) use polycarbonate track etched (PCTE) filters with CTAB extractions¹. His final points highlighted the importance of using a large volume of samples in order to obtain adequate results. He also noted seasonal sampling is important to make necessary inferences, and increased sensitivity requires increased vigilance to reduce the chance of contamination.

¹ CTAB refers to Cetyltrimethylammonium Bromide, a chemical compound used in extracting DNA.

Research in Detecting and Monitoring Great Lakes Invasive Species

Erik Pilgrim, Molecular Ecology Research Branch, U.S. EPA

Pilgrim presented on behalf of the U.S. EPA on research in detecting and monitoring Great Lakes invasive species. He highlighted the importance of early detection because it can be the difference between early eradication of an invasive species and ongoing management. He noted two EPA teams working on these efforts: (1) Mid-Continent Ecology Division in Duluth, Minnesota, and (2) Ecological Exposure Research Division in Cincinnati, Ohio.

The team in Duluth takes bulk benthic samples, grinds up the samples, and then runs them through a sequencer machine. This allows the team to simultaneously do PCR and genetic sequencing of the sample. This approach allows the researchers to use larger, mixed sediment samples and uses genetic sequencing to identify species. He noted two main investigative pathways for genetic monitoring for invasive species: (1) targeting particular invasive species with developmental biomarkers and (2) creating community profiles based on genetic data.

Other efforts by the research teams include benthos sampling, sensitivity training on constructed samples, and larval fish sampling. Benthos sampling has been conducted in lakes Superior and Huron. The results of these studies have been compared to standard National Coastal Condition Assessment (NCCA) data. Samples for sensitivity training include target and non-target fish tissue which has been created with adult fillets to mimic biomass conditions. Larval fish have been tested because fish eggs and larvae can serve as propagules and larval fish are generally more abundant than adults. The goals of the pilot larval study are to estimate detection probabilities, determine efficiency of sampling, and compare efficiency of sampling between juvenile and adult fish. The genetic results of larval fish sampling have showed strong signals for Eurasian ruffe, tubenose goby, and round goby. The research teams will continue to compare genetic and traditional results while verifying various aspects of their genetic work. The goal for the next set of samples is to provide methods and guidance for genetic monitoring and detecting invasive species in the Great Lakes.

Using a Ballast Water Prediction Model to Inform Surveillance and Response Monitoring Efforts

Lindsay Chadderton, TNC

Chadderton presented on ballast modeling efforts being developed at the University of Toledo. Since the opening of the St. Lawrence Seaway in 1959, ballast water has become the most important vector for spreading invasive species with data showing a steady increase in invasion rates since the opening. The goals of prediction modeling are to forecast where invasive species will likely spread. Prediction modeling identifies species that are already present in the Great Lakes but have yet to become widespread, and species that may invade the Great Lakes in the future with the goal of helping to inform detection and surveillance programs. Chadderton explained the process of developing a ballast water dispersal model which charts discharge and sources of ballast water. Using Eurasian ruffe as an example, he showed where the species has been found, its current location in lakes Superior, Michigan, and Huron, and the potential to spread to other parts of the Great Lakes. The prediction model for the Eurasian ruffe involved testing three models by back-casting the spread of the species from 1986-2011. The three models tested were a random model, which included no ballast water information, a location model, which tested the likelihood of any ballast water discharge locations becoming invaded and, a propagule model, which tested the probability that locations closest to invaded areas and receiving the most discharge from ruffe ports would be invaded. The results of the model predict that Chicago, Illinois, Saginaw Bay, Michigan, and Buffalo, New York are likely to be the next ports that are invaded. Similarly, Sandusky, Ohio, Detroit, Michigan and Cleveland, Ohio may also be at risk of invasion. The study also investigated zebra mussels.

Chadderton noted the next species to be studied is the killer shrimp. This predatory crustacean is widespread throughout Europe. It kills without consuming and is capable of killing larger prey such as larval fish. The model used to back-cast zebra mussels was identified as the best fit model to predict locations of killer shrimp. Killer shrimp are expected to invade from the east beginning in the St. Lawrence River. The model shows the invasion will spread from there with a 75-100% likelihood of invasion along the south western shores of Lake Erie in Ohio. Conversely, if the invasion starts in the Duluth-Superior harbor, there is a 75-100% likelihood of invasion in four of the five Great Lakes (Lake Ontario excluded). If the invasion were to start in Goderich, Ontario then the highest likelihood for invasion will be in Lake Michigan and the Michigan-Huron Corridor. Chadderton continued to highlight other predictions from the model. Notably, the greatest risk for large and rapid spread can be seen when the invasion point is either Detroit, Michigan or Green Bay, Wisconsin. Overall, this model can be used to inform delimitation priorities. A hurdle in the study is a lack of comparable ballast water discharge data from Canada. Looking forward, the research team will be adapting the tool to run in ArcGIS with the ability to input data. They will also be holding training workshops on the model.

Ohio Asian Carp Tactical Plan

John Navarro, Ohio DNR

Ohio's Asian carp Tactical Plan is a response to the positive findings of eDNA in state waters. The plan is organized by watershed and shows how Ohio will respond in a variety of scenarios. Ohio's main concern is the prospect of Asian carp entering the Muskingum River since the river is a potential conduit to Lake Erie. Ohio is collaborating with Natural Resource Conservation Service (NRCS) to determine the best option for closing the connection to the Killibuck Creek. The clear threat of invasion of Asian carp has enabled Ohio to access GLRI funding to support prevention projects. The state has created a decision matrix assessing the habitat, risk to the system, and ability to eliminate that risk. The degree of risk informs what action the DNR will take, i.e., whether the DNR will report internally, communicate externally, or conduct a planned response. In response to these studies and concerns, Ohio is undertaking the following actions: (1) Physical sampling of waterways, (2) monitoring commercial harvest, and (3) public reporting.

Council of Great Lakes Governors (CGLG) Mutual Aid Agreement

Matt O'Hara, Illinois DNR

At an executive meeting of the CGLG on April 25, 2014, the governors signed the Mutual Aid Agreement. The Mutual Aid Agreement will "empower the States and Provinces to act collaboratively and share staff and expertise in the event of a serious threat from aquatic invasive species." The Agreement is available on the [CGLG Website](#).

O'Hara explained a multi-jurisdictional response planning exercise which will be held at Calumet Harbor on May 28-29, 2014. This training is meant to showcase the Mutual Aid Agreement in practice. It will specifically target Eurasian ruffe, and is designed to test the incident command system response. It will utilize a number of electrofishing boats. Each boat will be sent on ten 15-minute runs to random sites from Lake Michigan to the Chicago River. Participants will be given their assignments, maps, and random samplings. Hopefully, this event will produce an after-action report so that this event can serve as a model for subsequent, similar trainings.

Committee Reports

Information and Education Committee

Doug Jensen, I/E Committee Chair, Minnesota Sea Grant

Several items continue to move forward from the December meeting including the recreational, water-garden, and classroom guidelines. They are not yet available from the ANSTF. The proposal to update and reprint the Great Lakes Aquatic Invasions booklet was not funded, but will be submitted again based on input on the last grant proposal. If any other agencies are interested in working together to provide funding, they should contact Erika Jensen at ejensen@glc.org. The committee received updates from the Ontario Federation of Anglers and Hunters regarding the Lake Superior AIS Field Guide. This non-technical guide is close to going to print. People interested in buying in should contact Matt Smith at matt_smith@ofah.org. A FWS field guide that compares species at risk to invade to look-alike species will be available soon. Products are made available on the GLP website. The committee continues to work with GLWQA Annex 6 on profiling high level education and outreach programs and projects in the region. A document will be sent to the full Panel later this spring requesting their input. Ohio Sea Grant is leading an effort to pull together an Asian carp bibliography and review additional outreach products. They are also identifying potential speakers for outreach opportunities and are providing supporting materials for those speakers to aid in sending a consistent message. Committee members will submit comments to Erika Jensen regarding the draft priorities statement regarding grass carp. Depending on the content of the policy and research priorities, the I/E committee is available to help communicate those priorities. The committee also hopes to update its I/E Priorities for the Great Lakes document at the meeting next fall to identify progress made and focus future work. Jensen reminded members that it is important for them to add their updates to the wiki to keep other members informed, and requested all members fill out the wiki before each Panel meeting.

ACTION ITEMS:

- When available from the ANSTF, distribute final recreational, water garden, and classroom guidelines to GLP members for their use and distribution and post to the GLP website.
- Working with the GLWQA Annex 6 Subcommittee co-chairs, finalize request to GLP members and interested parties to provide information about existing outreach products and evaluations to inform GLWQA subcommittee efforts.
- Committee members will submit comments regarding the draft priorities statement on grass carp. Once the policy and research committee priorities are established, the I/E committee will assess their role in helping with the communication of those priorities.

- Committee members will review the I/E priorities document at the Fall meeting.
- Entities interested in buying in on publication funding opportunities are encouraged to contact the appropriate project liaisons:
 - Great Lakes Invasions Booklet: Erika Jensen – ejensen@glc.org
 - Lake Superior AIS Field Guide: Matt Smith - matt_smith@ofah.org

Research Coordination Committee

Lindsay Chadderton, Research Coordination Committee Chair, TNC

The Research Coordination Committee highlighted three main points from their discussion: (1) canals and waterways as they relate to GLMRIS, (2) grass carp priorities and (3) research priorities to inform the GLWQA Annex subcommittees. Regarding canals and waterways, the committee discussed options to utilize: repellent barriers, non-lethal barriers, and lethal barriers. Specifically, the main lethal barrier discussed was hot water. The committee noted the benefits associated with this type of barrier such as a lack of chemicals. A potential con to this type of barrier is the level effectiveness. The grass carp discussion focused on control strategies as a primary research question. The committee identified three research questions for the GLWQA: (a) What is the role of climate change with respect to the spread of invasive species, (b) what is the potential of a ballast water standard for the region and (c) assessing the feasibility of the GLMRIS options.

ACTION ITEMS:

- Research priorities document
 - Update and incorporate priorities on GLMRIS and canals and waterways
 - Incorporate grass carp priorities
 - Submit updated document to ANSTF
- Grass carp: Integrate research priorities with other committee priorities into revised briefing paper for submission to ANSTF.
- Priority species list: Continue refining the list and integration with other lists and the research priorities document.

Policy Coordination Committee

Sarah LeSage, Policy Coordination Committee Chair, Michigan DEQ

The Policy Coordination Committee (PCC) priority document was submitted to the ANSTF. The PCC discussed three main issue areas during its breakout session: (1) GLMRIS, (2) grass carp, and (3) fish passage and dam removal. Regarding GLMRIS, the committee discussed the need for communication and coordination between the Great Lakes and Mississippi River groups, including between the GLP and MRBP, and between the GLC and MICRA. The committee suggested ways to improve communication and coordination on this issue, such as providing information and priorities to the GLC and GLP member agencies which they could use to encourage action by Congress and federal agencies. The ANSTF would be the primary audience for GLP information and recommendations, but all interested parties could use the messaging as part of their communication toolset or for discussions with congressional members. The committee continues to be interested in finding a way to summarize and utilize the comments made to the ACE on GLMRIS during the public comment period. The committee decided in lieu of a summary document they will create a matrix to organize agency and state comments based on preferred approaches to the issue. This will allow the reader to compare and contrast areas of support and disagreement amongst the comments, which will allow the region to focus its efforts. Staff capacity to support this effort may be a challenge. The committee has set a timeline for providing input on what actions should be taken in follow-up to GLMRIS as the end of December 2014.

The committee outlined two goals related to grass carp. First, prevent establishment of grass carp in the Great Lakes basin and second, prevent new introductions. In order to accomplish these goals, the committee has agreed to summarize the Grass Carp briefing paper into its most important points putting those in an overview document to serve as a resource. Second, the committee plans to put the management recommendations from the PCC priority document and insert them into the Grass Carp summary document. The committee held a brief discussion on fish passage and dam removal, noting that due to time constraints and other high priority work on GLMRIS and grass carp, that any further discussion or action on this issue will be postponed. The committee will plan to hold a conference call at the end of July to review progress on the GLMRIS matrix and grass carp document.

ACTION ITEMS:

- Create matrix of GLP member agency comments on GLMRIS and provide input on next steps by December 2014.
- Summarize grass carp briefing paper and insert goal and policy recommendations from the National Management Plan for review by a subgroup of the committee.
- Hold a committee conference over the summer.

Fall 2014 GLP Meeting

The GLP expressed interest in a joint meeting with the MRBP. Due to the conflicting meeting schedule of the MRBP, coordinating a joint session between the two panels in the fall is unlikely. It was suggested that the leadership of MRBP be invited to the GLP fall meeting and that a joint spring 2015 meeting be explored.

Public Comment

The floor was opened for public comment. None were received.

Emerging Issues and Announcements

Great lakes Briefs on Invasive Organisms Traded in Commerce (BIOTIC) Symposium will be held June 3 and 4, 2014 in Milwaukee, Wisc. Registration is open until May 17, 2014

The Upper Midwest Invasive Species Conference will be held in Duluth, Minn. on Oct 28-29. 2014.