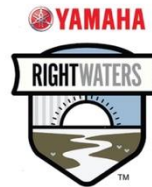
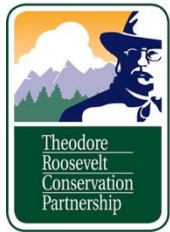


Aquatic Invasive Species Commission



Report and Recommendations:
**Improving the Prevention, Eradication,
Control and Mitigation of
Aquatic Invasive Species (AIS)**

February 2023

Introduction

The introduction and spread of aquatic invasive species (AIS) is one of the foremost challenges facing the United States, altering natural ecosystems, reducing biodiversity, harming water quality, and degrading waterways—with significant impacts on human health and recreational, commercial, and subsistence uses of waterways, fisheries, and other natural resources. From invasive fish like silver carp to invertebrates like zebra mussels and nuisance plants like hydrilla, the many challenges that AIS pose come with a steep price tag: an estimated global economic cost of \$345 billion since 1960 – nearly half of which has been incurred in North America. (Cuthbert, 2021ⁱ)

The impacts of AIS are far-reaching, affecting a broad range of ecosystems, industries, and stakeholders. Invasive zebra and quagga mussels, for example, can damage critical water and power infrastructure. A Great Lakes Commission report in 2012 (Warziniack, T. et al., 2021ⁱⁱ) found that invasive zebra mussels cause between \$300 and \$500 million in annual damages to power plants, water systems, and industrial water intakes in the Great Lakes region. European green crab prey on native shellfish, undermining recreational, commercial, and subsistence fisheries as well as eelgrass restoration projects at the cost of \$18.6 to \$22.6 million per year (Abt and Associates, 2008ⁱⁱⁱ). The outdoor recreation industry has long felt the impact of AIS. Between the ongoing efforts to control sea lamprey in the Great Lakes to the decades-long fight against invasive silver and bighead carp, recreational and commercial fishers and boaters have a deep and challenging history with AIS.

The Aquatic Invasive Species Commission was established by key members of the outdoor recreation industry in early 2022 to help stop and reverse the introduction and spread of AIS in the United States. The AIS Commission is comprised of a diverse group including leading scientists, conservationists, anglers, tribal leaders, boaters, business leaders, and policy experts (SEE APPENDIX A). The AIS Commissioners served on a voluntary basis and over the course of several months conducted a series of listening sessions and meetings (SEE APPENDIX B), during which they received input from experts, including state and federal agency personnel, leading scientists, congressional staff and members, and the fishing industry on various topics to inform this report. The recommendations in this report aim to address major AIS challenges in the United States.

Executive Summary and Priorities

The current landscape of AIS management in the U.S. includes a patchwork of engagement by dozens of federal agencies, states, tribes, and private entities. Different authorities are often siloed across the prevention, control, containment, and management processes. For example, while the U.S. Coast Guard is tasked with enforcing ballast water regulations, the U.S. Fish and Wildlife Service (USFWS) leads eradication efforts and the Departments of Homeland Security and Agriculture oversee biological border controls. Detection of AIS is shared between federal, state, municipal, tribal, and nongovernmental entities, often acting with minimal coordination and communication and insufficient funding, delaying responses and management, and costing more while being less effective. As AIS do not respect borders and jurisdictions, coordinating prevention, detection, management, control, and eradication activities is a challenging undertaking for the disparate entities involved in the management of our nation’s natural resources.

In recent years, numerous efforts by Congress and the White House have attempted to address this institutional patchwork. The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) created the Aquatic Nuisance Species Task Force (ANSTF), which convenes 13 federal agencies into a formal coordinating structure. While ANSTF and its regional panels have produced coordinated plans and research, the Task Force currently lacks sufficient capacity to facilitate thorough levels of coordination. The National Invasive Species Act of 1996 (NISA) amended NANPCA to create a ballast water management program, and subsequent legislation like the Vessel

Incidental Discharge Act of 2018 has further regulated vectors for invasive dreissenid (*i.e.*, zebra and quagga) mussels, though more is needed to regulate spread from smaller commercial and recreational vessels. Executive actions, like Executive Order 13112 signed by President Clinton in 1999, have called on federal agencies to prevent the spread and limit the introduction of invasive species. Executive Order 13112, along with EO 13751 in 2016, created and expanded the National Invasive Species Council (NISC) to provide leadership and oversight of interagency activities, encouraging cooperation among agencies and with nonfederal partners.

However, as no one law governs federal invasive species or AIS management, federal and state agencies struggle to effectively coordinate and fund efforts to prevent, detect, manage, and eradicate AIS. While established AIS continue to impact diverse stakeholders and industries, an increasingly interconnected world and changing environmental conditions heighten the risk of new introductions and increase the costs associated with already established invasive species. In most cases, prevention is the only way to effectively control AIS.

In this report, the AIS Commission submits recommendations for a renewed federal approach to addressing the challenges posed by AIS, informed by consultations with leading voices in natural resources policy, scientists, federal, state, and tribal representatives, and recreational stakeholders.

AIS Commission Priorities

The Commission's recommendations fall under several priorities:

1. **Update federal law and policy:** Amendments to federal law and policy should build on and modernize the existing framework for AIS to enhance prevention, to reduce spread, and to increase management.
2. **Increase federal funding:** Funding to address AIS should be coordinated, strategic, and targeted across federal departments, agencies, and bureaus, in collaboration with states and tribal organizations, to provide effective tools to address AIS at the regional and watershed levels.
3. **Enhance collaboration:** Interstate, regional, federal-state, tribal, international, and boating and shipping industry collaboration, communication, and planning is critical to AIS prevention, detection, management, and eradication.
4. **Maintain access to the water:** Laws, regulations, and policies addressing AIS at the federal, state, regional, and tribal levels should maintain access for boaters, anglers, and other users of our waterways in a manner that seeks to balance the use of waterways with the ecological health and long-term sustainability of critical natural resources.
5. **Increase public education and engagement:** Education of and outreach to the public, especially outdoor users like anglers, boaters, and hunters, and other conservationists, should be conducted to help reduce the persistent threats of AIS in federal, state, and tribal AIS programs and funding opportunities.

Taken together, these priorities outline an overarching framework for cross-jurisdictional AIS management that can prevent the introduction and spread of new and existing AIS with strategic, innovative, and effective response measures, laws, regulations, and policies.

Priority #1 – New AIS legislation should seek to build on and modernize existing policy.

In the United States, numerous federal and interagency entities share responsibilities relating to invasive species. Among the federal agencies involved are the Departments of Agriculture, Commerce, Defense, Homeland Security, Interior, Transportation, and others, including the Army Corps of Engineers (USACE), Environmental Protection Agency, and the Executive Office of the President. On average, the U.S. government spends an estimated \$2.3 billion annually across a range of federal agencies and activities to prevent, control, and eradicate invasive species domestically. This framework has been in place for decades, and yet AIS remains an elusive and persistent threat to our ecosystems and waterways.

Recommendation 1.1 – Foundational laws governing invasive and injurious species must be reviewed and modernized to address the existing and emergent biological threats of AIS, especially their identification and movement into the United States, between states and tribal lands.

The ever-increasing movement of goods and interconnected global scale of commerce represents one of the most significant challenges to the prevention and mitigation of the impacts of AIS. Congress should review and modernize federal biosecurity and AIS-related statutes and their implementation, such as the Lacey Act, the National Invasive Species Act, the Nonindigenous Aquatic Nuisance Prevention and Control Act, the Vessel Incident Discharge Act, the Water Resource Development Act, and the Federal Noxious Weed Act, to better support on-the-ground action to prevent, contain, and control invasive species. Specifically, the Lacey Act and the Federal Noxious Weed Act should be enhanced to limit interstate and intertribal movement of invasive and injurious species. Additionally, Congress should amend the Lacey Act to provide for the emergency designation of harmful or potentially harmful nonnative species without additional delays for issuing regulations or processing undue assessments before engaging in Early Detection and Rapid Response (EDRR). Critical to all these potential amendments is the adoption of a more consistent federal legal definition of “aquatic invasive species,” and the formulation of a methodology for the development of a species “whitelist,” or presumptive prohibition on the importation of species not already approved by the USFWS and a process for its utilization to prevent further infestation of AIS.

Recommendation 1.2 – As the primary bodies governing the coordination of interagency management, the National Invasive Species Council (NISC), the Invasive Species Advisory Committee (ISAC), and the Aquatic Nuisance Species Task Force (ANSTF) must be strengthened to meet the challenges of AIS prevention and control.

Nearly every federal agency has been given some role by Congress in the fight against invasive species. Often, this framework can lead to an inefficient and even confusing landscape of federal laws, regulations, and policies. Enhanced coordination is critical to the success of efforts to address a challenge like AIS that requires the active participation of

governing bodies at the federal, state, regional, and tribal levels. Congress should review whether expanded authority, funding, and/or more specific direction and clearly defined leadership roles for federal agencies are required to provide for improved coordination. The NISC and ANSTF should better coordinate their roles and determine avenues for partnership and support to facilitate and communicate on issues of mutual responsibility and concern. Additionally, the ANSTF should facilitate and coordinate EDRR actions through management plans in conjunction with states and tribal organizations, which will require additional staff and financial resources. To further enable improved coordination and focus, Congress should amend the NANPCA to establish the ANSTF as an independent entity in the federal government and authorize its receipt of appropriations. As a part of this amendment, Congress should designate or appoint a single executive, or two executives, drawing from each of the co-chairing agencies – the National Oceanic and Atmospheric Administration (NOAA) and USFWS - to co-lead ANSTF and facilitate the implementation of strategic goals and to be accountable for the success of the Task Force. These amendments could help expand federal capacity to address AIS, increase accountability, and provide for dedicated staff to better coordinate federal efforts. Expanded authority and funding from Congress should also allow for increased meeting frequency, deeper collaboration on priority issues, and increased support for regional panels. Additionally, Congress should examine ways to empower consensus-driven decisions made in the regional panels by providing an alternative path for management plan certification when regional panels achieve unanimous consensus. Lastly, Congress should expand the ANSTF membership to include non-governmental organizations that work to address the impacts of AIS or otherwise have a specific interest or expertise in the prevention, control, or mitigation of the impacts of AIS, including outdoor recreation advocacy organizations and businesses.

Recommendation 1.3 – Ballast water management efforts should be strengthened by ensuring that all vessels that engage in ballast water discharge be required to adhere to U.S. law and consistent international standards.

The use and discharge of ballast water is an essential aspect of waterborne commerce. Ballast water discharge often contains non-native, invasive, and exotic species that have caused extensive ecological and economic damage to aquatic ecosystems. Congress should strengthen the Vessel Incidental Discharge Act of 2014 to protect state, federal, and international waters. Congress should also consider establishing a grant fund to encourage installing, using, and maintaining type-approved ballast water management systems (BWMS) to meet regulations of the International Maritime Organizations Ballast Water Management Convention. The United States should also participate in national or binational scientific or monitoring programs providing information as result of discharge sample collection and analysis following monitoring requirements as indicated by the EPA’s Vessels General Permit (VGP).

Priority #2 – Strategic, Targeted Funding for AIS Prevention and Management.

Federal funding and appropriations have been critically important to state and tribal management agencies and federal entities seeking to implement AIS control and eradication programs. Federal funding has driven transformative research studying invasive species behavior, reproduction, vectors of introduction, early detection methods, and controls. However, there are continued capacity and funding constraints across government and slow progress in developing integrated, effective control and eradication methods for some of the most urgent AIS needs.

Recommendation 2.1: Federal funding should support proven management plans and alleviate capital constraints on state and tribal agencies.

Ensuring federal, state, and tribal agencies have sufficient and strategically targeted funding is critical to the successful prevention and mitigation of the impacts of AIS. While there are examples of well-funded, strategic, and coordinated efforts to manage or address AIS in some regions, the present framework allocates limited funding to states and tribal agencies and does not incentivize coordination at the regional level. Congress should review federal funding streams and consider specific actions, as follows:

- Appropriate funds, with **reduced cost-share requirements**, for coordinated prevention, detection, management, and eradication actions under ANSTF and NISA-approved management plans, including WRDA projects and fish barrier projects.
- **Increase grant funding to states and tribal agencies** for ANSTF-approved state, interstate, and tribal invasive species management plans through Section 1204 of the NANPCA, or to otherwise increase capacity to address AIS within their jurisdictions.
- **Appropriate funds for proven technologies** like invasive fish barriers and deterrents, employing such techniques as bioacoustic fish fences, gas bubble screens and electric fences, or other appropriate technologies along with traditional physical structures on interjurisdictional waterways and waters of regional and national importance based on ANSTF priority sites.
- **Increase funding through regional restoration programs**, focusing on agencies that already have federal, state, and tribal administrative structures established to expand grant funding for AIS management, eradication, and outreach.
- **Authorize and fund the ANSTF as an independent federal entity** that can receive and grant federal appropriated funds **OR ensure all federal agencies have sufficient funding** to administer and operate an AIS Program with dedicated staff.
- **Increase funding and support for coordinated cross-jurisdictional watershed level basin teams** to coordinate at least annually on the implementation of Sections 505 and 506 of the 2020 Water Resources Development Act. Barriers in bureaucratic processes should be reduced to advance achieving implementation objectives.

Recommendation 2.2: Federal funding should boost research and pioneer innovations in AIS prevention, detection, management, control, and eradication and their pathways.

The persistent spread of AIS has led to greater research and spurred innovative approaches to halt their spread and mitigate their harmful impacts. Congress should examine and consider investing in innovation centered around effective interventions against AIS and their invasion pathways. For example, exciting progress is being made with genetic sterilization methods for zebra mussels and the use of eDNA for invasive species detections. The use of emergent technologies in artificial intelligence, remote sensing and monitoring, unmanned aircraft, and other technologies to better manage ship fouling for both commercial and recreational vessels should be funded by Congress. These new funding opportunities should engage state and tribal leaders and other stakeholders who have on-the-ground experience and understanding of the challenges that AIS present. To facilitate further coordination and prioritization, a single federal research fund for AIS management and control should be established, and the appropriate federal agency selected, to support research funding across agencies, such as through the USACE Aquatic Nuisance Species Research Program and for the ANSTF Research Committee with a focus on completing the projects on the National Priorities List for Research on Aquatic Invasive Species. Additionally, the development of decision support tools with proven success to aid invasive species managers would help prioritize limited time and resources.

Congress should also direct all federal agencies with regulatory purview over AIS, in cooperation with the ANSTF, to carry out ongoing evaluations to assess high-performing AIS control efforts and should report the specific results of this analysis to ANSTF for development and sharing of best management practices (BMPs).

Lastly, NOAA should establish, or Congress should authorize, the establishment of an Office of Invasive Species at NOAA headquarters and include reengagement in a water management technologies demonstration program (on-vessel or on-shore), in coordination with the U.S. Coast Guard and the U.S. Environmental Protection Agency (EPA), to assist the maritime industry in the achievement of ballast water standards in U.S. law and promulgated by the International Maritime Organizations.

Recommendation 2.3: Federal funding and enhanced agency coordination should be targeted at prevention and Early Detection and Rapid Response and to build capacity and flexibility for when AIS outbreaks are detected.

Invasive species prevention is the first line of defense, but the deployment of Early Detection and Rapid Response (EDRR) is to coordinate a set of actions to find and eradicate potential invasive species before they spread and cause harm or contain and control invasive species until a long-term management plan is established.

In recent years, the Federal approach to AIS has included increased funding and planning centered around EDRR. This is extremely encouraging and should be examined for increased investment. To further facilitate coordination and the rapid utilization of EDRR funds, Congress should direct the leading federal agencies to define all key governmental and nongovernmental partners to be involved in carrying out the response and clearly designate

the authority of each partner agency. Additionally, Congress should consider increasing funding for federal, state, and tribal invasive species strike teams and build capacity on teams to serve in coordinating EDRR actions with federal agencies, state governments, and tribes. This funding would build overall capacity to implement EDRR in the context of state, interstate, and tribal Aquatic Nuisance Species Management Plans.

Additional efforts to coordinate the successful funding and implementation of EDRR should include:

- NISC and ANSTF should continue the development of coordinated EDRR plans and workflows to better mobilize interagency action when AIS are identified.
- NISC and ANSTF member agencies should cooperatively develop an asset inventory to enable relevant agencies to develop a more accurate and useful EDRR cross-cut budget.
- ANSTF should be empowered and funded to work with regional panels to identify a list of species that require EDRR actions. For each species, the panels should facilitate a process for monitoring to determine such things as the leading edge of the invasion front (at various life stages), spawning habitat and other traits, and demarcation points that must trigger a rapid response. Response actions should be pre-identified if the species (at the life stage identified) is detected at or beyond that demarcation point.
- The ANSTF should work to identify and establish regional panels, including regulatory agencies, to streamline permitting for AIS rapid response actions, and in doing so, the ANSTF should identify all material and data resources available to form EDRR plans and facilitate a process to share and integrate data; facilitate the development of model rapid response plans for adaptation and use by any order of government and for any species; fund the development of species-specific rapid response plans for species identified by regional panels as highly likely to require a rapid response; and, assist the appropriate order of government in attaining “pre-approval” from appropriate agencies (e.g., state, EPA) for the implementation of an accepted rapid response plan.
- Congress should appropriate funds and direct the ANSTF member agencies to cooperatively fund a study that examines regulatory barriers to rapid response efforts – including the Endangered Species Act (ESA), the National Environmental Protection Act (NEPA), property laws, the Clean Water Act (CWA), the Environmental Protection Act (EPA) herbicide and pesticide regulations, etc., and to make recommendations to Congress on appropriate changes to federal laws and authorities constraining potential EDRR actions. ANSTF should work with the Council on Environmental Quality (CEQ), in coordination with NISC, to develop guidance on leveraging emergency authorities to bypass constraints on controls and EDRR.
- Congress and the appropriate federal agencies should examine the creation of categorical exclusions and appropriate waivers and exemptions for EDRR actions when AIS outbreaks threaten vital fisheries, watersheds, and aquatic habitat or infrastructure.

- Congress should extend exemptions granted to federal agencies (e.g., Bureau of Land Management (BLM), USFWS, USACE), as appropriate, to states and tribes, conditioned on acting through management plans and EDRR pathways approved by ANSTF.

Priority #3 – Federal-State, Interstate, Tribal, Regional, International, and Interagency Coordination

The unique challenge of addressing AIS cuts across state and tribal agencies, dozens of federal agencies, and a wide range of stakeholders in between. Because AIS do not observe borders or jurisdictions, moving freely across state, tribal and national boundaries, coordination is central to effective AIS policy. Wildlife managers and policymakers have launched countless regional and species-based panels and initiatives to address AIS controls. While these bodies have been effective in sharing information and research, few coordination institutions have been leveraged to develop highly integrated AIS management plans.

Recommendation 3.1 – Congress should direct appropriate agencies to clarify regulatory authority among state, tribal, federal, and interagency entities to identify regulatory gaps, redundancies, and weak links and to identify areas for collaboration and resource-leveraging.

Congress should direct funding to the ANSTF to commission a study or provide an updated report on the effectiveness of AIS statutes, regulations, and policies at the federal, state, and tribal levels, identifying well-performing interagency regulations and making recommendations to member agencies and state and tribal governments on model legislation. This study or report should include, but not be limited to, an analysis of policies and processes for joint rulemaking and enforcement by federal agencies for federal lands managers to regulate the movement of invasive species, as well as an analysis of regulatory gaps surrounding vectors that may undermine enforcement and enable introduction of AIS. A potential outcome of this analysis could be the adoption of more consistent and “harmonized” rules and regulations addressing AIS and providing for more effective coordination with state and tribal authorities. Even further, strengthening U.S. coordination with Canada and Mexico would provide enhanced tools for federal, state, and regional regulators to address AIS. The ANSTF, or appropriate federal agency, should liaise with its counterparts in Canada and Mexico and use existing cross-border institutions (e.g., the regional panels, the Great Lakes Fishery Commission, the Pacific States Marine Fisheries Commission, the Invasive Carp Regional Coordinating Committee) to coordinate invasive species management, science, policies, law enforcement, EDRR, education, and communications. Existing agreements that contain invasive species measures should be fully funded.

Recommendation 3.2 – Congress should direct the appropriate agencies or the ANSTF to identify priority ecosystems that may be more vulnerable to invasion under changing environmental conditions.

With limited resources, prioritization is paramount to preventing the introduction of AIS, limiting their spread, and mitigating their harmful impacts on large ecosystems. While considerable effort and analysis is invested in strategies to evaluate and prioritize pathways and species of concern, more analysis should be conducted on which ecosystems may be more at risk to invasion by nonnative and harmful aquatic species than others. This analysis could help inform the strategic investment of federal, state, and tribal resources in a more efficient manner.

Recommendation 3.3 – To maximize efficiency, federal agencies should work to enhance information sharing and data-driven solutions to aid in the development of AIS management processes, including prevention, control, and management and EDRR plans while monitoring is shared to ensure resources are leveraged.

Pending additional funding and capacity, ANSTF should review, revise, and renew coordinated management plans for AIS every 5 years, incorporating additional analysis and best practices from participating federal, state, and tribal agencies and AIS researchers, and identifying species that have the highest impact on ecosystems and greatest costs associated with programs intended to address their harmful presence.

Priority #4 - Laws, regulations, and policies that address AIS should maintain access for boaters, anglers, and other users of waterways in a manner that seeks to balance the use of waterways with the ecological health and long-term sustainability of critical natural resources.

The most effective way to prevent AIS contamination is through robust, coordinated action on all levels – federal, state, local, tribal, industry and individual. While it may be impossible to eradicate AIS from infested locations, ongoing management actions and regulations on the federal, state, regional and tribal levels have proven that it is possible to at least control and stop the spread of these species. In addition to focusing on prevention in the first instance, future efforts should place more emphasis on developing innovative ways to prevent AIS proliferation that still allow boaters and anglers to move from one water body to another.

Recommendation 4.1 – Federal, state, and tribal agencies should work to establish a more coordinated, expedited, and reciprocal process for watercraft inspection, decontamination, and enforcement.

Aquatic invasive species can be spread from waterbody to waterbody by attaching to commercial vessels as well as recreational boats, trailers, or docks. AIS proliferation prevention has caused some authorities to limit boating access, close public boat ramps and reduce fishing opportunities across the United States. Inconsistent or unclear rules and regulations can represent a barrier to anglers, boaters, and other users of waterways. ANSTF should encourage and facilitate state and tribal adoption and implementation of regionally coordinated approaches, such as the “Model Legal Framework for Watercraft Inspection and

Decontamination Programs” developed by the National Sea Grant Law Center and the Association of Fish and Wildlife Agencies. Additionally, Congress should define federal agency authority to conduct inspections and support infrastructure for Watercraft Inspection and Decontamination (WID), such as inspection stations.

Other key actions to improve watercraft inspection and decontamination should include: (1) the development of a common certification system and penalty structures for noncompliance and violation, (2) the WID Data Sharing System to record and share data electronically about inspection and decontamination, and (3) an analysis on decontamination station siting and effectiveness, recommending and prioritizing investment at vulnerable and high-traffic waterways.

Lastly, Congress should consider incentives that encourage states to enter interstate compacts that include cross-jurisdictional penalties such as the loss of boating privileges. Other initiatives like the Interstate Wildlife Violator Compact or Operation Game Thief should be examined as models to be replicated. Additionally, Congress should fund the installation of user-operated decontamination stations at boat launches and access points on federal waterways, and highly-used non-federal waterways, allowing anglers and boaters to clean, drain, and dry watercraft to prevent the spread of AIS.

Recommendation 4.2 – Federal policy should seek to incentivize the further development of AIS-resistant boating and recreational equipment.

The boating industry has taken proactive steps to combat AIS through boat design and construction. The ANSTF should take the lead in building upon, expanding, and promoting partnerships between managing agencies and the marine industry, specifically the National Marine Manufacturers Association (NMMA), American Boat and Yacht Council (ABYC), Watersports Industry Association, and BoatUS to implement the ABYC Technical Information Report (T-32)^{iv} on AIS. Additionally, the ANSTF and ABYC should develop AIS standards for boat, engine, and trailer manufacturing that build on the guidance provided in the ABYC T-32 Technical Information Report. ABYC T-32 is a technical information report and does not contain requirements for boat builders to follow. Instead, it highlights best practices and considerations for design and collateral literature for consumer education. There is nothing to enforce within this report; however, NMMA covers this topic with the boat builders in the annual compliance seminar. These voluntary designs standards could include aspects that alter and/or improve the design, engineering and manufacturing of ballast tanks, inboard engines, inboard/outboard engines, and new watercraft to eliminate or reduce the probability of quagga or zebra mussels and other AIS from being transported in recreational watercraft and to make it easier and safer to inspect and decontaminate watercraft compartments and propulsion systems.

Also, Congress should examine ways to incentivize boat, engine, accessory, fishing gear and equipment, and trailer manufacturers to develop and adopt new and innovative designs and models that limit unwanted transfer of AIS and aid in safely expediting WID protocols per the ABYC T-32 Technical Information Report on AIS. These efforts should take the form of an AIS validation program for manufacturers following the best practices outlined in the

ABYC T-32 but not penalize those who are limited by the use and environment in which the boats will be used.

Priority #5 – Education of and outreach to the public, especially outdoor users like anglers, boaters, and hunters, should be conducted to help combat the persistent threats of aquatic invasive species in federal, state, and tribal AIS plans and funding opportunities.

Beyond the federal level, state and tribal harvest programs in the southeast offer one of the most effective examples of AIS controls. In Kentucky and Tennessee, commercial fishers have been leveraged to harvest and eradicate invasive carp. Harvested carp are often turned into fertilizer or animal and pet food, forming a market-driven compensation structure supplemented by state subsidies. This state-led public-private market mechanism has created a vested commercial interest in AIS eradication that can supplement appropriations-driven control and harvest efforts. While long-term impacts and efficacy of AIS harvest markets remain somewhat uncertain, innovative control strategies have brought new stakeholders to the table in combatting established AIS.

Recommendation 5.1 – Federal policy should seek to strengthen market-based incentives for AIS harvest, processing, use and consumption.

Whether in the swamps of Louisiana or on the big waters of the Great Lakes, interest has grown in ways to encourage the harvest and use of invasive species as a means of controlling or eradicating their harmful spread. Incentivizing and encouraging public or commercial harvest could be a useful tool to support targeted AIS management while also spurring economic development and better stewardship of our natural resources. Congress should expand USFWS grants to states and tribes to support contract fishing, including per-pound subsidies for invasive carp harvest and other harvest of AIS. Additional funding could support research and science-supported bounty programs for AIS harvest, while prioritizing limiting the spread and reducing population sizes of AIS. These funding initiatives could be further leveraged by establishing a dedicated grant program within the U.S. Department of Agriculture’s (USDA) Agriculture Innovation Center Program to explore applications for harvested AIS biomass, including fertilizer, feed, and human consumption. Lastly, Congress should consider directing the USDA, or other appropriate agencies, to develop a waiver system omitting the processing of select AIS, such as blue catfish, from onerous inspection requirements.

Recommendation 5.2 Natural resource managers should maintain and enhance successful public engagement strategies that support behavioral change and reach underserved/underrepresented audiences.

Outreach and education are critical to affecting the human behaviors that contribute to the spread of AIS from one waterway to another. Natural resource managers at the federal, state,

regional, and tribal levels should seek to engage and elevate trusted voices among recreational user groups, hunters, anglers, the pet industry, aquaculture, and other industries and communities that may serve as vectors for AIS introduction and spread. ANSTF should convene federal, state, regional, and tribal agencies to launch coordinated and science-based public education and outreach campaigns on AIS prevention, leaning on trusted and influential voices within recreational fishing and boating communities, the hunting community, and other relevant communities. These campaigns should be continuously assessed, including with stakeholder input, for their effectiveness at producing positive behavioral change and their reach to underserved and underrepresented audiences. Additionally, BMPs for reducing the spread of AIS should be developed and promoted.

Congress should provide additional funding for the appropriate agencies to expand signage and visual-textual cues, and work to address language barriers at boat launches and fishing access points to induce AIS prevention activities, including “Clean, Drain, Dry” decontamination actions and “Don’t Let it Loose” messaging. Also, federal resource managers should be encouraged to expand opportunities for citizen data collection and open-access data systems to support AIS detection and aid wildlife managers in conducting EDRR actions, and further coordinate these data to maximize their utility to decision makers. These efforts could be leveraged by an enhanced ANSTF website as the central clearinghouse for AIS information.

APPENDIX A

AIS Commission: Steering Committee and Members

Leading scientists, conservationists, anglers, boaters, business leaders, and policy experts were convened to assess the persistent threat of AIS and identify more effective solutions. The AIS Commission Steering Committee and Members are:

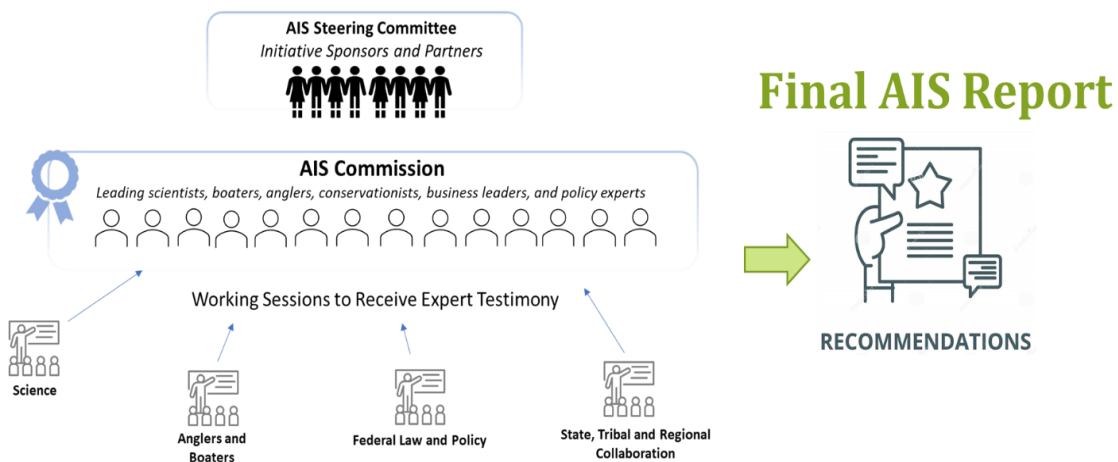
Martin Peters, Yamaha
Jennifer Silberman, Yeti
Clay Crabtree, National Marine Manufacturers Association
Mike Leonard, American Sportfishing Association
Gene Gilliland, B.A.S.S.
Chris Edmonston, BoatUS
John O’Keefe, Yamaha
Heather Hennessey, Yamaha
George Cooper, Forbes-Tate
Christy Plumer, TRCP
Chris Macaluso, TRCP
John Arway, Retired State Director (PA)
Elizabeth Brown, NAISMA
Jason Christie, Pro Angler
Kerry Wixted, Assn. of Fish & Wildlife Agencies

Jake Dree, Yeti
Marc Gaden, Great Lakes Fishery Commission
Alanna Keating, BoatUS Foundation
Monica McGarrity, Texas Parks and Wildlife Department
Mark Menendez, Pro Angler
Ish Monroe, Pro Angler
Ben Mohr, Alaska conservationist
Steve Moyer, Trout Unlimited
Stephen Phillips, Pacific States Marine Fisheries Commission
Mathew Van Daele, Sun’aq Tribe of Kodiak
Nick Wiley, Ducks Unlimited
Drue Winters, American Fisheries Society
Dennis Zabaglo, Tahoe Regional Planning Authority

APPENDIX B

AIS Commission: Process and Meetings

The AIS Commission received input from and engaged in dialogue with key stakeholders, federal and state decision makers, and leading experts. The purpose of this collaborative process was intended to assess the current threat from AIS, explore gaps in public policy and funding, and offers recommendations for how AIS can be addressed more effectively at the federal, state, tribal and regional levels.



March 4, 2022: AIS Commission Bipartisan Congressional Briefing (Virtual)

The AIS Commission met in virtual session with leading Congressional staff to discuss the goals and objectives of the AIS Commission and receive input on federal policy and new legislation. The Commission received input from representatives of the:

U.S. Senate Commerce, Science and Transportation Committee, Majority and Minority Staff

U.S. Senate Environment and Public Works Committee, Majority and Minority Staff

U.S. House Agriculture Committee, Majority and Minority Staff

U.S. House Natural Resources Committee, Majority and Minority Staff

Office of U.S. Senator Debbie Stabenow

Office of U.S. Rep. Tony Gonzales

July 21, 2022: AIS Commission: Angler and Boater Listening Session (ICAST Convention)

The AIS Commission met in person and via video conference during the 2022 International Convention of Allied Sportfishing Trades (ICAST), the world's largest sportfishing trade show produced by the American Sportfishing Association. The purpose of the meeting was to better understand the experience of professional and recreational

anglers and boaters, how their time on the water is impacted by AIS and to receive these stakeholders' views on the effectiveness of current AIS programs. The Commission received input from stakeholders in the professional and recreational angler community, as well as the boating industry, including:

Mark Menedez, Professional Angler
Ish Monroe, Professional Angler
Gene Gilliland, B.A.S.S.
Ed Rudeberg, CD3 Boat Cleaning Systems

July 25, 2022: AIS Commission Science Listening Session (Virtual)

The AIS Commission met in virtual session with nationally and internationally recognized experts and leading scientists regarding the current state of science as it relates to AIS control, risk assessments, engineering and technology, and genetics and biocontrol. The AIS Commission received input from:

Dr. David Lodge, Cornell University
Dr. Oscar Casas-Monroy, Fisheries and Oceans Canada
Dr. Judith Pederson, Massachusetts Institute of Technology Sea Grant
Dr. Jeff Hill, University of Florida
Dr. Jason Delborne, North Carolina State University
Mike Greer, U.S. Army Corps of Engineers, ERDC
Sarah LeSage, Michigan DEQ

August 17, 2022: AIS Commission State, Regional, and Tribal Listening Session (Kenai, AK)

The AIS Commission met in person and via video conference at the Kenai River Classic Roundtable on National Sportfish in Soldotna, Alaska. The purpose of the meeting was to better understand state and tribal issues with AIS, including specifically those facing communities in Alaska. In addition to a panel discussion, the Roundtable was attended by U.S. Senators Lisa Murkowski and Dan Sullivan, as well as Governor Mike Dunleavy. During the Roundtable, the AIS Commission received input from:

Tammy Davis, Alaska Department of Fish & Game
Aaron Martin, U.S. Fish and Wildlife Service
Mathew Van Daele, Sun'aq Tribe of Kodiak
Daniel Smith, Sun'aq Tribe of Kodiak Tribal Biologist
Ben Mohr, AIS Commissioner and Alaskan Conservationist

August 31, 2022: AIS Commission External Listening Session: State and Regional (SOBA Conference)

The AIS Commission met in person and via video conference at the 2022 States Organization for Boating Access (SOBA) Education & Training Symposium in Cleveland, Ohio. The purpose of the meeting was to better understand the relationship of boaters and state regulators as it relates to the management of AIS. The AIS Commission received input from:

John Navarro, Ohio Department of Natural Resources
Craig Walker, Utah Division of Wildlife of Resources
Alanna Keating, AIS Commissioner and BoatUS Foundation

October 4, 2022: AIS Commission External Listening Session: Federal Law and Policy (Washington, DC and Virtual)

The AIS Commission met in person and via video conference at the National Press Club Building in Washington, DC to receive an update and briefing from lead federal agency staff on the current legal, policy and regulatory framework in place to address AIS. The purpose of the meeting was to better understand the effectiveness of existing laws and policies and how current law, policy and funding availability can be enhanced to better prevent and mitigate the harmful impacts of AIS. The AIS Commission received input from:

Stas Burgiel, Executive Director, National Invasive Species Council
Hilary Smith, Senior Advisor for Invasive Species, U.S. Department of the Interior
Susan Pasko, Executive Secretary, ANS Task Force
Phil Andreozzi, Invasive Species Coordinator, U.S. Department of Agriculture
Mike Ilemni, National Invasive Species Program Manager, USDA Forest Service
Jeremy Crossland, Biologist, U.S. Army Corps of Engineers

December 1, 2022: AIS Commission External Listening Session: State Legislative and Conservation (National Assembly of Sportsmen's Caucuses Annual Sportsman-Legislator Summit)

On behalf of the AIS Commission, a presentation was made by Connor Bevan of American Sportfishing Association to leading conservationists and state legislators on the preliminary report, findings and recommendations of the AIS Commission. Leading state legislators and conservationists provided key feedback on the draft recommendations and the impacts of AIS on state and local communities, and their economies.

APPENDIX C

ACRONYMS AND ABBREVIATIONS

ABCY	American Boat and Yacht Council
AIS	Aquatic Invasive Species
ANS	Aquatic Nuisance Species
ANSTF	Aquatic Nuisance Species Task Force
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
CEQ	White House Council on Environmental Quality
CWA	Clean Water Act
DEQ	[Michigan] Department of Environmental Quality
EDRR	Early Detection and Rapid Response
EPA	U.S. Environmental Protection Agency
ERDC	U.S. Army Corps of Engineers, Engineer Research and Development Center
ESA	Endangered Species Act
IMO	International Marine Organizations
ISAC	Invasive Species Advisory Committee
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NEPA	National Environmental Protection Act
NISA	National Invasive Species Act
NISC	National Invasive Species Council
NOAA	National Oceanic and Atmospheric Administration
NMMA	National Marine Manufacturers Association
SOBA	States Organization for Boating Access
TRCP	Theodore Roosevelt Conservation Partnership
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Department
VGP	Vessels General Permit
WID	Watercraft Inspection and Decontamination
WRDA	Water Resources Development Act

CITATIONS

ⁱ Cuthbert et al (2021). Science of The Total Environment. *Science of The Total Environment*. Volume 775. <https://doi.org/10.1016/j.scitotenv.2021.145238>

ⁱⁱ Warziniack, T. et al. (2021). Economics of Invasive Species. In: Poland, T.M., Patel-Weynand, T., Finch, D.M., Miniati, C.F., Hayes, D.C., Lopez, V.M. (eds) *Invasive Species in Forests and Rangelands of the United States*. Springer, Cham. https://doi.org/10.1007/978-3-030-45367-1_14

ⁱⁱⁱ Abt and Associates (2008). Ecological and Economic Impacts and Invasion Management Strategies for the European Green Crab. Paper Number: EE-0513. 06/03/2008. <https://www.epa.gov/environmental-economics/ecological-and-economic-impacts-and-invasion-management-strategies-european>

^{iv} American Boat & Yacht Council (ABYC), T-32 Report: Description and Design and Construction in Consideration of Aquatic Invasive Species, Revised 2021. <https://abycinc.org/store/viewproduct.aspx?id=18741732>