

Montana Aquatic Invasive Species Management Plan

2025



Suggested Citation: Montana Fish, Wildlife & Parks. 2025. Montana Aquatic Invasive Species Management Plan. Helena, MT. XX pp.

Table of Contents

Acknowledgements.....	6
Tables	6
Figures.....	6
Abbreviations & Acronyms	7
Executive Summary.....	9
Introduction	11
Plan Purpose	12
Process and Participation.....	12
Regional Coordination	13
AIS Management in Montana	14
History and Program Accomplishments	14
AIS Management Approach	17
Prevention.....	18
Early Detection.....	18
Rapid Response.....	18
Eradication and Control	20
Education and Outreach	20
Funding Strategies	21
Scope.....	23
Comprehensive Management Perspective	23
Problem Definition.....	26
Overview	26
Ecological and Economic Impacts	29
Climate Change and Invasive Species	30
Risk Assessment and Prioritization	32
Prioritizing Pathways and Threats	32
Pathways.....	33
Fishing and Recreation Activities	34
Fishery and Wildlife Enhancement	34
Commercial Transportation of Vehicles or Equipment	35

Montana Aquatic Invasive Species Management Plan

Organisms in Trade	35
Field Activities	35
Industrial Activities.....	36
Landowner and Agriculture Activities.....	36
Biological Control	36
Natural Disasters.....	36
Free-flowing Water	37
AIS of Interest	38
Prohibited and Controlled Wildlife and Fish Species	40
Noxious Weed List.....	40
Plan Goal	41
Existing Authorities and Programs.....	41
Federal Authorities and Programs	41
Lacey Act	41
Executive Order 13112.....	42
Executive Order 13751.....	43
Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990	43
National Invasive Species Act of 1996	43
Aquatic Nuisance Species Task Force	43
State Authorities, Programs and Roles	44
Montana Aquatic Invasive Species Law	44
Tribal Programs.....	46
Regional Programs	47
Program Objectives.....	48
Strategies to Address Program Objectives	48
Objective A: Maintain and Expand Coordination.....	48
Objective B: Prevent the Introduction	50
Objective C: Early Detection	52
Objective D: Rapid Response and Preparedness	53
Objective E: Control and Eradicate	53
Objective F: Outreach, Education and Behavior Change	54

Montana Aquatic Invasive Species Management Plan

Objective G: Evaluation of Laws and Rules	55
Priorities for Action	56
Program Monitoring and Evaluation	58
Gaps and Challenges	60
Implementation Tables	61
Definitions	86
Literature Cited	87
Appendices.....	92
Appendix A. Summary of Public Comments	93
Appendix B. Exotic and Prohibited Species.....	94
Appendix E. Noxious Weed List	99
Appendix C. Federal Entities and Authorities	101
Appendix D. Interagency MOU on AIS Management	105
Appendix E. Montana AIS Laws, Rules and Statues	112

Acknowledgements

This management plan is designed to be a proactive and comprehensive guidance document that encompasses input and feedback from diverse partners, stakeholders and entities interested in practical aquatic invasive species (AIS) management in Montana. The dedication and interest of Montanans to participate and engage in AIS management efforts across the state is significant and recognized. The work to protect Montana’s waters from the impacts of invasive species falls to all of us as Montanans together.

Tables

Table 1. Snapshot of non-native species present in Montana

Table 2. Pathway and Species Prioritization Factors for Consideration

Table 3. Aquatic invasive species present in Montana Waters

Table 4. Aquatic Species Not Present and Identified as Threat to Montana Waters

Figures

Figure 1. Milestones in Montana AIS Management

Figure 2. Invasion Management Phases

Figure 3. Protect our Waters Campaign

Figure 4. Major Waters of Montana

Figure 5. Distribution of Key Aquatic Invasive Plants in Montana

Figure 6. Distribution of Key Aquatic Invasive Invertebrates in Montana

Figure 7. Montana Land Ownership by Entity

Abbreviations & Acronyms

AIS	Aquatic Invasive Species
ANS	Aquatic Nuisance Species
ANSTF	Aquatic Nuisance Species Task Force
APC-WID	Aquatic Plant Control – Watercraft Inspection and Decontamination
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CEMIST	Central and Eastern Montana Invasive Species Team
CRB	Columbia River Basin
CSKT	Confederated Salish and Kootenai Tribes
DNRC	Montana Department of Natural Resources
EA	Environmental Assessment
EPA	Environmental Protection Agency
FWP	Montana Fish, Wildlife & Parks
HACCP	Hazard Analysis Critical Control Point
ICS	Incident Command System
ISAC	Invasive Species Advisory Committee
ISAN	Invasive Species Action Network
MCA	Montana Code Annotated
MISC	Montana Invasive Species Council
MDA	Montana Department of Agriculture
MDEQ	Montana Department of Environmental Quality
MDT	Montana Department of Transportation
MNHP	Montana Natural Heritage Program
MOU	Memorandum of Understanding
MRB	Missouri River Basin
NAISMA	North American Invasive Species Management Association
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NISA	National Invasive Species Act
NISC	National Invasive Species Council
NOAA	National Oceanic and Atmospheric Administration
PNWER	Pacific Northwest Economic Region
NPS	National Park Service
PSMFC	Pacific States Marine Fisheries Commission
RFID	Radio Frequency Identification
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFS	U.S. Department of Agriculture Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WID	Watercraft Inspection and Decontamination
WISCE	Western Invasive Species Coordinating Effort
WMCC	Western Montana Conservation Commission
WRP	Western Regional Panel on Aquatic Nuisance Species

Executive Summary

The waters of Montana cover 177,000 stream miles and over 10,000 lakes, ponds, and reservoirs. As a northern state of the Mountain West, the upper reaches of major rivers flow through Montana and therefore any aquatic invasive species (AIS) that is introduced into Montana waters has the potential to spread downstream to other states. Montana's status as a headwater state puts additional responsibility on Montana to do all it can to combat the introduction and spread of AIS.

The purpose of this comprehensive state management plan is to identify objectives that will ensure the prevention and mitigation of AIS to protect and preserve the waters of Montana and the species and habitats they support. The Plan is intended to help coordinate efforts and secure long-term funding to accomplish the goal, including pursuing opportunities for federal cost-share support for implementation. The goal is to proactively address aquatic invasive species that threaten Montana with both long and short-term actions.

The objectives of the Montana AIS Management plan include:

- Coordination and implementation of an AIS Management Plan
- Prevent the introduction of AIS into and within Montana
- Early detection and monitoring aquatic invasive species in Montana
- Rapid Response preparedness
- Control and eradication of aquatic invasive species where feasible
- Provide outreach and education to expand public understanding, involvement, and promote behavior change
- Periodic evaluation of AIS laws and rules

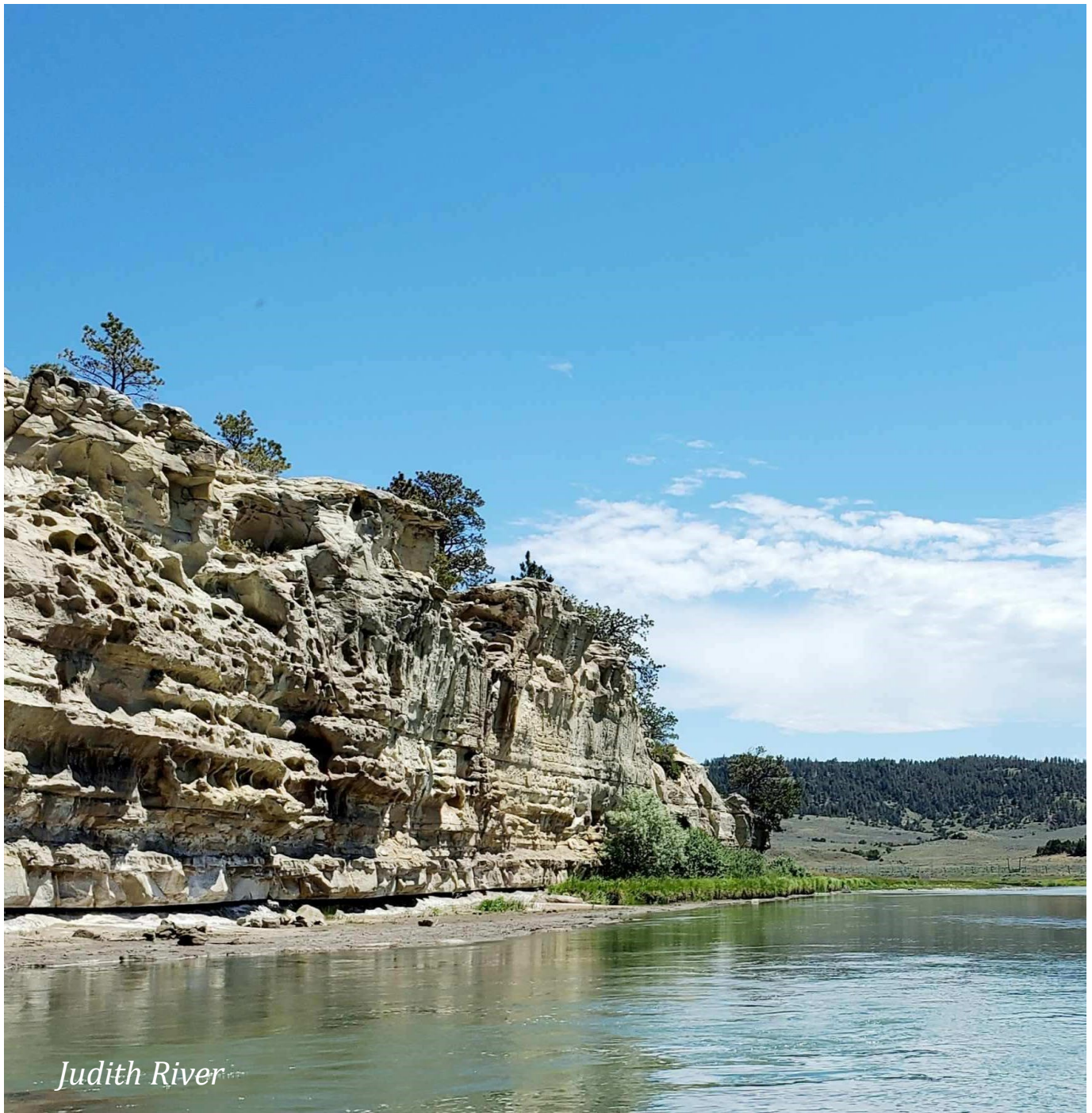
The Plan was compiled and reviewed by personnel from state agencies, federal agencies, Tribes, non-governmental organizations and private individuals. Public comments have been solicited and incorporated and the Plan has been submitted to ANSTF for review and comment. Following this work, the *2025 Montana Aquatic Invasive Species Management Plan* (hereafter called the Plan) is intended to guide future AIS issues and actions for the state.

The responsibility and authority to protect the state from AIS does not fall to one agency or entity. It involves people from across the state working together with a common purpose. Tribes and counties, fishing groups and conservation organizations, power companies and agriculture groups, state, and federal agencies, all work together to protect the state. Current AIS efforts have made and continue to make significant accomplishments addressing AIS issues. Working closely with partners, the state AIS program regularly evaluates operations and strategies and adapts the program to improve program effectiveness and efficiency. By working together, we advance our abilities to prevent, detect, respond and educate on AIS.

The Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990 and the National Invasive Species Act (NISA) (1996) called for the development of state and regional management plans to control aquatic invasive and nuisance species. After approval of a state plan by the Aquatic Nuisance Species Task Force (ANSTF), matching funds for activities described in the management plan become

Montana Aquatic Invasive Species Management Plan

available. The first AIS Management Plan for Montana was approved and adopted in 2002 and since that time many things have changed. The 2025 Plan builds on the work that has been accomplished in the past twenty-three years and looks to a future where the state can continue to address the AIS threat to Montana.



Introduction

Aquatic invasive species (AIS) are introduced plant, animal, or microbe species that threaten the diversity or abundance of native species, the stability of aquatic ecosystems, or commercial, agricultural, aquacultural or recreational activities. As per state statute aquatic invasive species is defined as “a nonnative, aquatic species that has caused, is causing, or is likely to cause harm to the economy, environment, recreational opportunities, or human health” [Montana Code Annotated (MCA), 80-7-1003]. When some species are introduced into new habitats they may grow, reproduce, and spread rapidly due to the absence of natural predators and other controls. Once established, they are often impossible to eradicate and they can consume or displace native species, clog waterways, impact municipal and agricultural systems, alter ecosystem function, threaten recreational and commercial fisheries, limit recreational opportunities, and cause public health issues. New analysis indicates that biological invasions cost the United States at least \$21 billion per year (Fantle-Lepczyk et al. 2022). To protect our natural environments, the species they support and the economies we rely on, an aquatic invasive species management plan can focus efforts and resources.

Key national legislation has fostered the development of AIS management and coordination. The Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) was passed on November 29, 1990, and subsequently amended by the National Invasive Species Act of 1996 (NISA). Under section 1204 of NISA, states are authorized to present a comprehensive management plan to the Aquatic Nuisance Species Task Force (ANSTF) for approval. Montana was one of the first western states to develop an AIS management plan as indicated in NANPCA. The Montana Aquatic Nuisance Species Management Plan (hereafter referred to as the Plan) was completed and formally approved by Montana Governor Martz and the ANSTF in 2002.

The Plan has served as a guide on AIS prevention, early detection, and management for Montana for over 22 years. Under this plan, Montana’s AIS Program developed, improved, and evolved. The AIS Program is a multi-agency effort with Fish, Wildlife & Parks (FWP), Department of Natural Resources (DNRC), the Western Montana Conservation Commission (WMCC), Montana Department of Agriculture (MDA) and Montana Department of Transportation (MDT) taking specific roles. The AIS Program underwent significant expansion in 2017 following the detection of dreissenid veligers in Tiber and Canyon Ferry reservoirs. The 2017 Montana Legislative Session bolstered staff and funding to expand capacity. The AIS Program tripled in size with expanded watercraft inspection, early detection monitoring and outreach. New requirements were established for watercraft inspection including (1) mandatory inspection for watercraft entering the state (2) mandatory inspection for watercraft crossing west over the Continental Divide, and (3) mandatory inspection for watercraft exiting Tiber and Canyon Ferry. The 2017 Montana Legislative Session also expanded AIS responsibilities for DNRC by establishing the Upper Columbia Conservation Commission (now referred to as Western Montana Conservation Commission) and providing AIS funds to support the AIS Grant Program. These functional changes along with the expansion of the program highlight the need for a revision of the Montana AIS Management Plan.

Plan Purpose

The purpose of the Plan is to identify objectives that will ensure the prevention and mitigation of AIS to protect and preserve the waters of Montana and the species, habitats and economies they support. Further, the purpose is to provide guidance to FWP, DNRC and WMCC, and collaborating partners and entities for the prevention, monitoring, control and outreach of aquatic invasive species in Montana using cooperative methods. The Plan identifies specific invasive species of concern; however, the plan utilizes a strategy that focuses on pathways to address AIS prevention and management. Further, the goal and strategic objectives of this plan remain consistent with the original plan. The changes reflected in this plan highlight species of concern, new strategies and tools, and other advancements in AIS management.

Process and Participation

The process to develop a revised AIS management plan to serve Montana has utilized many methods to ensure that diverse perspectives and priorities are captured, considered, and met. The number entities and level of interest in invasive species management in the state is very robust and active. The revision of the Plan required a process that could capture a diverse sentiment of active and engaged Montanans on AIS. The revision and development of this updated Plan has included partner input through multiple public events to scope priorities and issues, as well as comment review opportunities and feedback.

- Input on draft Plan goals and objectives was initiated through an AIS Summit that was convened December 4th and 5th, 2019 in Helena, MT to discuss AIS issues, gather partner input and solicit recommendations for program planning and development.
- Input from partners at the summit was incorporated into a document that generated draft Plan objectives strategies and actions. This document was made available for public comment from November 2nd through December 4th, 2020. A press release was issued to major state newspapers, followed by an email to all coordinating agencies providing notification for public comment.
- A virtual AIS Summit was held on November 18th, 2020, to present the status of the current AIS program, to solicit input on updating the Plan and to request feedback on the Plan objectives, strategies and objectives. Questions and feedback from the virtual summit were also incorporated into the Plan.
- In June 2024, a draft plan was circulated to key partners for initial review and feedback.
- **Date to be Determined**, a draft plan was made available for public comment and review.
- Partner input and feedback was incorporated to create a preliminary final plan and was distributed for public comment. At this time, the Plan was also distributed to ANSTF for review and comment.
- All comments were reviewed and addressed to create the final Plan (Appendix A).
- The final Plan was submitted to the Governor and was signed on **(insert date)**. Following the Governor's approval, the Plan was submitted to the Federal ANSTF for approval.

This Plan is intended to be dynamic and allow for the capacity to address new threats and changing circumstances. The activities and priorities of the Plan will be reviewed regularly and periodically by the

FWP AIS Management Team, partner agencies and other interested parties with a report produced for the ANSTF. This report will include recommendations for updating and modifying management activities and priorities as appropriate.

Regional Coordination

Montana's AIS Program staff work closely with many entities in the state and across the country to ensure consistency and continuity with other regional and national efforts. FWP coordinates closely with federal partners including U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Agriculture Forest Service (USFS), U.S. Army Corps of Engineers (USACE), U.S. Bureau of Reclamation (BOR), National Park Service (NPS) and U.S. Bureau of Land Management (BLM). Additionally, FWP represents Montana on the Western Regional Panel (WRP) and the Mississippi River Basin Panel (MRBP) of the ANS Task Force, the Columbia Basin Team, the Missouri Basin Team, and plays an active role in the Western Invasive Species Coordinating Effort (WISCE) which is a forum for western AIS coordinators to work together promoting coordination and consistency on AIS issues. Throughout the development of this Plan, FWP has coordinated closely with USFWS to ensure adherence to all ANSTF requirements of a state ANS Plan.

Specific steps necessary to implement this plan include coordinated AIS efforts in Montana, coordination of regional AIS efforts, stable funding dedicated for AIS related activities, strengthened prevention efforts, continued strategic early detection monitoring for waters, growing a volunteer survey network, increased public education, implementation of control and eradication of AIS, and regular program evaluation to improve effectiveness and efficiency.

There are several existing plans that have influenced the development of this plan. The following documents provide valuable insight into the specific management needs of Montana and elements of these plans were considered in the Plan development.

- Updated Recommendations for the Quagga and Zebra Mussel Action Plan for Western U.S. Waters (Western Regional Panel on ANS 2020)
- Columbia Basin Flowering Rush Management Plan: A regional strategy to address *Butomus umbellatus* throughout the Columbia Basin (Columbia Basin Cooperative Weed Management Area 2019).
- Building Consensus in the West Workgroup: Final Activity Report 2011-2019 (Western Regional Panel on ANS 2019)
- Columbia River Basin Interagency Invasive Species Response Plan: Dreissenid Species (Heimowitz and Phillips 2018)

AIS Management in Montana

History and Program Accomplishments

The origins of AIS management in Montana have its roots in FWP's Hatchery Bureau where there was a focus on fish disease prevention and concern about warm water fish introductions. In the mid-1990s, Montana's aquatic resource managers were responding to the impacts from an introduced parasite, *Myxobolus cerebralis*, that causes whirling disease in coveted wild trout populations as well as New Zealand mudsnail (*Potamopyrgus antipodarum*) infestations that were causing uncertain harm to iconic trout rivers. With this as a backdrop, FWP recognized the need for active deliberate management associated with introduced species and an aquatic invasive species program was created in 1999 (Figure 1). In the early 2000s, AIS management among many state programs was focused on specific species. The discovery of invasive dreissenid mussels in Lake Mead (NV) in 2007 and Lake Powell (UT, AZ) in 2012 created greater urgency among western states to seek additional preventative strategies to limit their introduction elsewhere. Recognizing that the 100th Meridian had been breached, Montana began inspections of trailered watercraft beginning in 2005.

A comprehensive monitoring program has been used to conduct prioritized sampling of waterbodies across the state. Annual monitoring provides information to inform potential management actions to protect Montana's aquatic resources. Also unique to Montana is the FWP AIS Early Detection Laboratory which has served as a primary resource to Montana and surrounding states in its capacity to provide identification services for invasive dreissenid mussels and other AIS since 2005. In 2016 another milestone event solidified AIS management as a priority for Montana when invasive mussels were detected during routine monitoring efforts by BOR and FWP in Tiber and Canyon Ferry Reservoirs. In the 2017 legislative session, Montana legislators responded with additional resources and staff to expand AIS prevention, early detection, outreach and response preparedness. This tripled the size of the AIS program and created a well-funded and well-staffed program that has become one of the most effective in the Nation. Between 2017 and 2023, the AIS program produced significant accomplishments including:

- Establishment or improvement of 17 watercraft inspection stations at high-risk locations state-wide, which has resulted in four times more watercraft inspections conducted prior to 2017 mussel detection.
- Expanded coordination with conservation districts, Tribes and counties including contracting operation with watercraft inspection stations. Contracting with partners allows for local oversight and enhances local involvement and quality control at watercraft inspection stations.
- Established on-site storage, office facilities, and on-demand decontamination units at most inspection stations.
- Expanded inspection station period of operation and operating hours at high-risk boat traffic locations.
- Implemented ongoing assessment and implementation of protocols and procedures to improve quality control at inspection stations.
- Expanded enforcement and centralized dispatch targeted at priority areas.

- Adopted the Western Watercraft Inspection Data App to expand coordination and data sharing with western watercraft inspection programs.
- Expanded the AIS early detection program including tripling the number of samples collected and processed at the FWP AIS Early Detection Lab.
- Expanded the FWP AIS Early Detection Lab into a modern lab space.
- Developed the AIS Monitoring App that allows sample collection to be logged electronically. The app is available to partners to facilitate involvement with early detection monitoring.
- Expanded partner training and involvement in AIS early detection surveillance.
- Direct contracts with partners to support early detection surveillance.
- Integrated environmental DNA (eDNA) as a regular part of state-wide invasive mussel early detection surveillance.
- Deployed a focused AIS outreach effort targeting Montana residents and out of state boats destined for Montana waters. Outreach efforts are distributed state-wide utilizing social media, radio, television, print, billboards, gas station TV and hand-out materials.
- Expanded partnerships state-wide with conservation districts, counties, tribes, nonprofit organizations, federal agencies and local communities to deliver AIS outreach and education information in local communities.
- Updated the DNRC AIS grant program to better allocate resources to priority projects including a transition to Montana Invasive Species Council (MISC) involvement in grant proposal decisions.
- Established the WMCC to facilitate coordination and communication on water quality and AIS issues with partners and stakeholders in western Montana.
- Establishment of the Central and Eastern Montana Invasive Species Team (CEMIST) to facilitate coordination and communication on AIS issues in eastern Montana.
- Developed a dreissenid mussel economic impact assessment and dreissenid mussel rapid response guidelines through MISC.

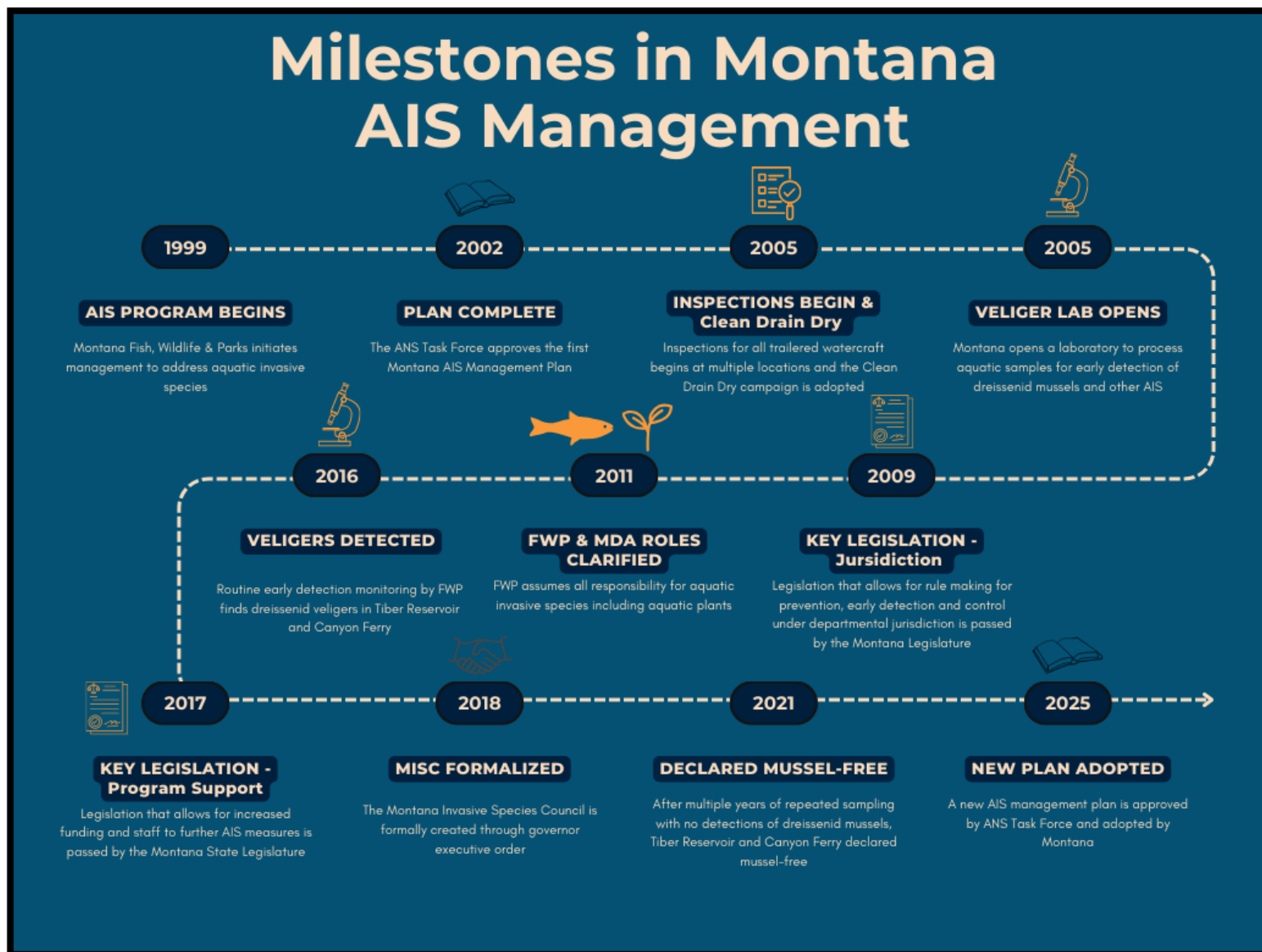


Figure 1. Milestones in Montana AIS Management from 1999 to present. Key milestones include legislative provisions for AIS management, completion of management plans, delineation of roles and responsibilities and critical actions for management and leadership.

AIS Management Approach

The management of AIS in Montana requires consideration of specific species and various pathways that may negatively impact Montana waters, the identification of realistic control or eradication options for AIS that may be feasible and cost-effective, a commitment to utilize the best available tools and information to successfully address AIS and sufficient funding to protect Montana's natural resources and economies.

There are several components of a comprehensive AIS management approach and these include: (1) prevention, (2) early detection, (3) rapid response, (4) eradication and control, (5) education and outreach, and (6) funding. These management components can be applied at any scale – from national, regional, state, or local. The management approach used will depend on the stage of invasion from a particular species (Figure 2). Each component requires education and outreach elements to engage key audiences and promote desired behaviors. The AIS management approach recognizes an emphasis on prevention coupled with early detection to avoid the establishment of new AIS. However, swift actions to contain and eradicate high-risk AIS remain key elements in Montana's approach.

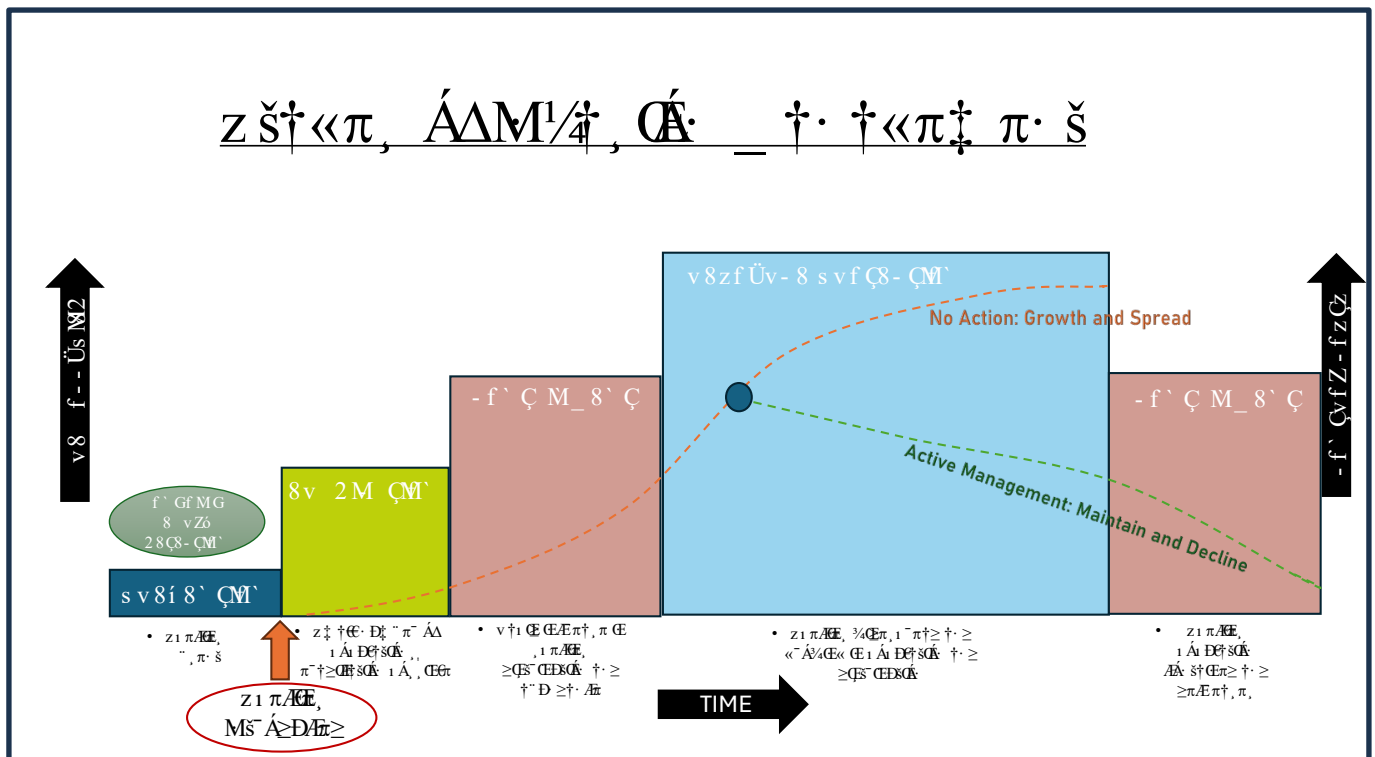


Figure 2. The stages of invasive species management – the generalized invasion curve. Invasion curve follows stages of prevention coupled with early detection, eradication, containment, and resource protection. Under no action, species population may grow and spread beyond initial population. Under active management, species population may be maintained and potentially decline. Concept modified from Invasive Plants and Animals Policy Framework, 2010, Victorian Government Australia.

Prevention

Methods to address invasive species that are not established or to restrict further spread are preventative. Prevention efforts require comprehensive approaches to minimize species introduction in Montana waters. The effort and costs required to eradicate or contain AIS populations once they become established far outweighs those expended on prevention. Key prevention actions such as watercraft inspection and decontamination are used to address this primary AIS pathway. Coupled with robust outreach programs that engage and inform diverse audiences such as watercraft operators, members of the agriculture community, students, and homeowners in their role of the prevention of AIS introduction are critical. In addition to water-based activities, a review of potential pathways of introduction or spread is critical to understanding the risks Montana faces and then prioritizing effort. Finally, key legislative provisions provide the ability to manage AIS efficiently and thoughtfully. Prevention efforts are considered the most effective approach to reduce the impacts of invasive species.

Early Detection

Many invasive species are not yet established or present in Montana. By conducting deliberate and consistent survey efforts in the waters of Montana, AIS management can proactively address issues potentially before a species becomes established. The early detection effort not only provides key information of species presence but allows Montana to act responsively with improved likelihood of preventing spread or a larger unmanageable population becoming established.

Montana's early detection program results in thousands of samples collected and analyzed annually for the presence of high-risk AIS. This work has revealed multiple key detections of novel species that led to management actions to control or eradicate a species. With thousands of waterbodies in Montana, a survey strategy is used to determine waterbody prioritization and frequency for sampling. Early detection methods incorporate various sampling techniques to improve the detection capabilities of new species. In addition to a comprehensive early detection monitoring program conducted by FWP, there are multiple entities that also conduct early detection monitoring on key waterbodies across the state that increase the monitoring effort substantially.

Rapid Response

An important aspect of AIS management is being equipped to quickly address the discovery of an invasive species and determine the required steps of action particularly for species identified as high priority. Assembling a team to address this discovery requires a rapid response plan with coordination among state, federal, Tribal and local entities. Each situation will hold unique conditions related to the species and environment and other regional processes. Rapid response exercises are valuable for preparing for an actual discovery.

Montana developed the Dreissenid Mussel Rapid Response Guidelines in 2018 and regularly participates in rapid response exercises to prepare for the possibility of different species introduction and establishment. Conducting periodic rapid response exercises are critical learning sessions that are important for executing a management strategy under pressure and finding consensus among a variety of stakeholders. Preparedness and ability to respond to suspected aquatic invasive species introductions

are an important part of the management strategy. On-going communication with regional partners is an essential aspect to Montana's ability to respond rapidly.

The following section is excerpted from the Western Regional Panel on Aquatic Nuisance Species Rapid Response document (California Department of Food and Agriculture 2014) and serves as a general guideline to leadership agencies in Montana faced with responding to the detection of an aquatic invasive species.

"The goal of the model system is to create a consensus-driven decision process, but one where discussions about general strategies occur before the arrival of a new invader."

In almost all situations involving aquatic invasive species, the circumstances of the response will likely be complex. The elements of a response that need to be considered include:

1. Clearly identify authority, leadership, and organization, in both jurisdictional and operational capability.
2. Coordination and cooperation among the different jurisdictional parties.
3. Identification of potential funding and resources.
4. Delimitation survey and mapping to determine the scope of the detection, including an evaluation of risk of spread.
5. Targeted and timely public information and education, including outreach to affected land and resources owners and parties.
6. Establishment of quarantine and containment actions, including enforcement.
7. Review of knowledge on biology and available controls. This may include convening a science/management/environment advisory panel to facilitate information sharing to the best available techniques and tools.
8. Identification and implementation of potential treatment methods, including repeat survey and treatment to ensure eradication.
9. Compliance with environmental regulatory requirements, such as obtaining permits, developing documentation, and minimizing impacts to non-target species.
10. Treatment assessment and adaptation. Accountability for progress towards eradication.
11. Environmental monitoring.
12. Restoration/mitigation.

The Incident Command System (ICS) is a standardized approach to incident management and can be used successfully to organize AIS rapid response. AIS rapid response exercises have incorporated ICS to effectively address AIS aspects of a response (see www.crbdirt.com). These exercises have been facilitated by the Pacific States Marine Fisheries Commission (PSMFC) and bring key partners together to participate.

In recent years, Montana has hosted two rapid response exercises testing Montana's Dreissenid Mussel Rapid Response Guidelines (Montana Fish, Wildlife & Parks 2018). In 2011, Montana hosted its first dreissenid-based rapid response exercise in Libby. In September 2018, a response exercise was held at Flathead Lake simulating a response to dreissenid detection. The response utilized a unified command

between CSKT and FWP and brought together state and federal partners to explore response. A follow-up response exercise was held between CSKT and FWP in December 2022.

In September 2021, Montana hosted another exercise at Fort Peck Reservoir working closely between FWP, USACE, USFWS and other partners to review a response to dreissenid mussels. In 2024, dreissenid rapid response exercise was conducted in Cranbrook, British Columbia as a joint exercise with Montana and British Columbia on Lake Koocanusa. The current Dreissenid Mussel Rapid Response Guidelines and regular exercises to explore response capabilities continues to be a priority for Montana AIS preparedness.

Eradication and Control

Once a species is detected there may be an opportunity to eradicate before it becomes established and spread occurs. Taking swift decisive action is a key element to attempting a possible eradication of an AIS. If there are suitable and practical tools that can be used to eradicate a species, then moving to implement that control effort will require an understanding of impacts to the target and non-target species, environmental regulatory requirements, gauging public support for actions and predicting overall success of applied actions. A complex decision process will be required.

Montana has conducted several eradication attempts of AIS. Notably corbicula clams (*Corbicula fluminea*) in Lake Elmo and Eurasian watermilfoil (*Myriophyllum spicatum*) in Nilan Reservoir. Eradication methods used in Lake Elmo required dewatering the lake and exposing clams to freezing temperatures. Nilan Reservoir was a rapid assessment and application of herbicides to spot treat multiple plants. Continual monitoring and assessment of treatments are part of these eradication efforts. Without these proactive management actions, these species would continue to spread to nearby waterbodies and across the state.

There are some cases where an established population of AIS will require repeated and targeted control efforts to minimize ecological impacts and enhance human use of the waterbody. The extensive population of Eurasian watermilfoil (*M. spicatum*) in Noxon and Cabinet Gorge Reservoirs has taken significant effort and planning by Sanders County to address. Similarly, watermilfoil in Fort Peck Reservoir requires multiple partnerships and considerable effort to minimize these established populations.

Education and Outreach

Montana has active partnerships across the state to promote and educate about AIS. There are diverse audiences, and the strategies required to effectively disseminate AIS information must also be diverse. An additional area of outreach focus has been to connect with visiting audiences, such as out of state recreationists, prior to their arrival in Montana. There are several AIS campaign messages that Montana emphasizes:

- **Clean Drain Dry** is a campaign that Montana has used to reach non-motorized and motorized watercraft users for over a decade. This campaign aligns with many western states and provides a consistent message for recreationists regionally. While the emphasis of this campaign is on

watercraft users, it has been successfully used to reach different audiences like anglers, waterfowl hunters and other water recreationists.

- **Protect our Waters** is another campaign that encourages pride in water use and its protection regardless of the activities that may be taking place on the water. Key audiences include irrigators and homeowners.



Figure 3. Protect Our Waters campaign is used to reach diverse audiences across Montana.

- **Don't let it Loose** is a campaign that Montana has used to reach pet and aquarium owners, and pet and aquarium stores for over a decade. This campaign also aligns with many western states and provides a prompt to pet owners to take alternative actions to the release of unwanted pets and plants.

Funding Strategies

Funding is essential to the success of implementing the key elements of invasive species management. The funding that supports the AIS programming in Montana takes multiple forms, including federal sources and appropriated funds from the Montana Legislature.

- The completion of an ANSTF approved plan has provided funding since 2002. The amount of that funding has changed over the years and is used to support key objectives identified within the Plan.
- The Montana State Legislature convenes every other year to approve a budget for agency operations, including programmatic funding for the AIS program administered by FWP.
 - State funding sources for supporting AIS efforts include:
 - Resident and non-resident angler prevention pass
 - Non-resident motorized and non-motorized watercraft prevention pass
 - Hydroelectric generation
- Aquatic Plant Control-Watercraft Inspection & Decontamination (APC-WID) funding from the federal program administered by the USACE. This cost share funding is used to support watercraft inspection station operations and early detection sampling and survey associated with nearby USACE dam facilities (projects).
- USDA Forest Service provides funding to support AIS survey and outreach.
- The BOR periodically provides funding to support specific needs such as decontamination equipment, a decontamination and education trailer, and AIS outreach.

Potential future funding could include the AIS Trust Fund. The fund was created by the 2017 Montana State Legislature (MCA 80-7-1016) for the purposes of supporting local projects for AIS. The fund may not be appropriated until the principal reaches \$100 million. As of 2024, the principal balance was

\$1,000. Should the trust fund be capitalized this would provide a mechanism to support AIS management activities.



New Zealand
mudsnail survey in
Silver Bow Creek

Scope

Montana is the fourth largest state in the United States by area and characterized by its diverse landscapes of mountain peaks, rolling plains, large lakes, and extensive rivers coupled with a relatively sparse human population of just over 1 million people. The waters of Montana cover 177,000 stream miles and over 10,000 lakes, ponds, and reservoirs (Figure 4). These waters provide extensive recreational opportunities and are the basis of a critically important tourist economy that draws visitors from around the world. Recreational tourism is often the primary and sometimes the only business in many parts of Montana. However, agriculture and resource-extraction industries throughout the state represent significant economic drivers. Critical infrastructure including multiple hydroelectric dam facilities, large irrigation networks, municipal drinking water plants, industrial processing facilities, and fish hatcheries rely on the clean water of Montana to function. Protecting their operation is central to Montana's economy.

The Continental Divide cuts through the state creating a hydrological division and variables that help characterize Montana for its wide-open rolling prairies and snow-covered mountains. The Continental Divide drives two major water systems that feed into the Pacific Northwest and the Central US. To the West of the Divide, waters feed the Clark Fork, and Columbia River systems ending in the Pacific Ocean. To the East of the Divide, the Missouri and Yellowstone River systems feed the Mississippi ending in the Gulf of Mexico. To the North, the St. Mary River flows into Canada and ultimately into Hudson Bay. As a northern state of the Mountain West, the upper reaches of these major rivers flow through Montana and therefore any AIS that is introduced into a Montana river has the potential to spread downstream to other states. Montana's status as a headwater state puts additional responsibility on Montana to do all it can to combat the introduction and spread of AIS.

Comprehensive Management Perspective

Just as AIS introductions and spread are not limited by geopolitical boundaries, management planning must also consider strategies that surpass boundaries. The revised Montana Plan builds on past and current assessments and planning efforts, as well as a diversity of regional efforts to protect the state from aquatic invasive species.

Building upon the foundation established by the original Montana Plan, the following documents, coupled with the existing authorities and programs captured in this plan, provided guidance for developing the revised Montana Plan.

- Montana Statewide Fisheries Management Plan 2023-2026
- Montana Fish, Wildlife and Parks AIS Management Program Field Sampling and Laboratory Standard Operating Procedures
- Enumeration of Potential Economic Costs of Dreissenid Mussel Infestation in Montana
- Montana Invasive Species Law Review Compendium
- Montana Invasive Species Council Dreissenid eDNA Science Advisory Panel Report
- Montana Dreissenid Mussel Rapid Response Guidelines
- Montana Noxious Weed Management Plan
- Governor's Summit on Invasive Species Summary Report

Montana Aquatic Invasive Species Management Plan

- Montana Management Assessment of Invasive Species
- Montana Invasive Species Framework
- Montana Fish, Wildlife & Parks Statewide Integrated Noxious Weed Management Plan

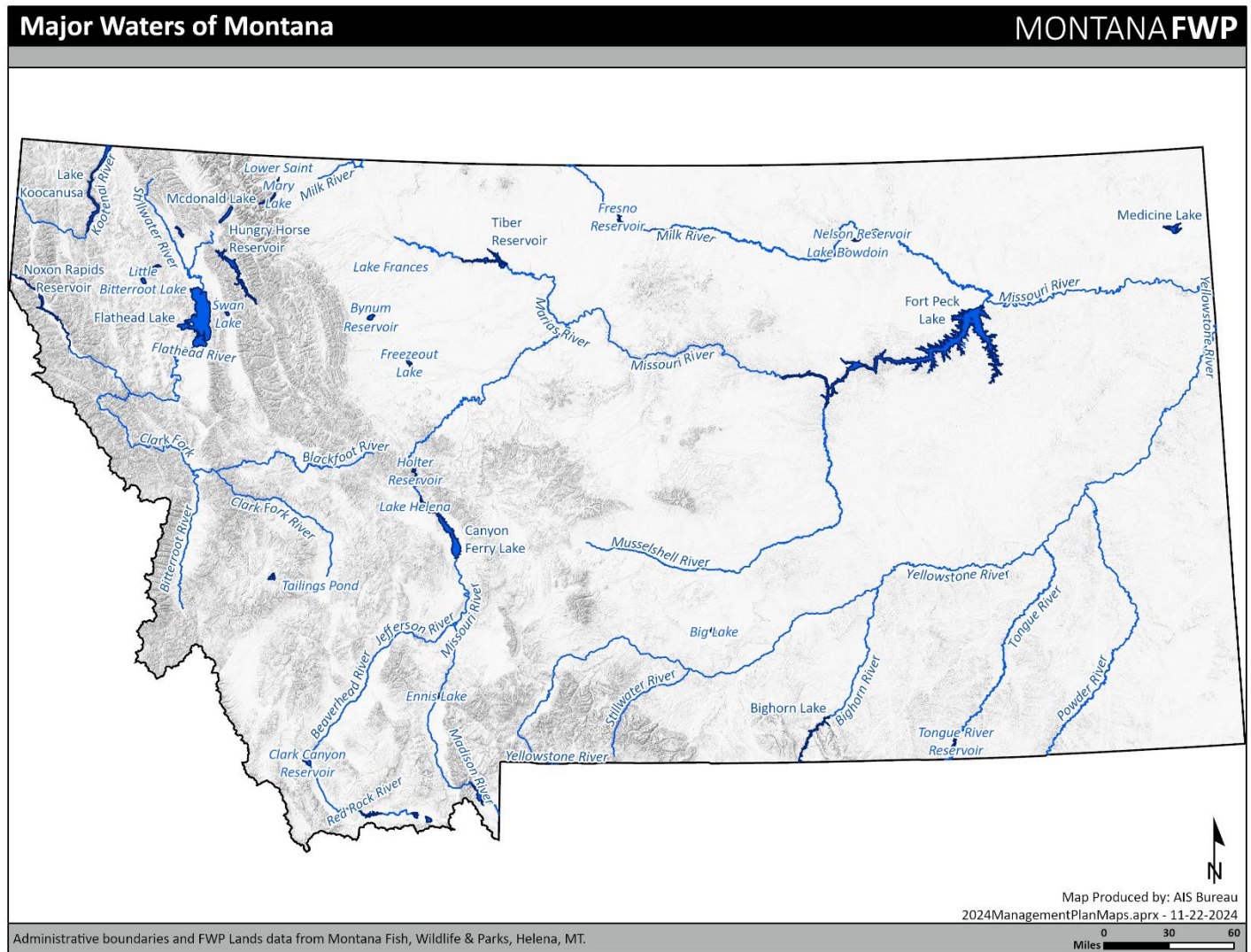


Figure 4. Major waters of Montana.

Montana Aquatic Invasive Species Management Plan

The following points guided the development of the original Plan and remain true for the 2025 Plan as well.

- 1) There are many pathways for the introduction and spread of AIS, most of which are human caused. New species continue to be introduced and spread within North America through these pathways.
- 2) Introductions have many costs associated with them, including control and management, lasting changes to ecosystems, loss of recreational opportunities, economic burdens on state, regional, and municipal entities to address AIS, and direct costs to private industries and consumers.
- 3) Often there are few, if any, acceptable controls available for use in natural water bodies once AIS becomes established.
- 4) Once species are introduced and become successfully established, control efforts are costly and total eradication is often unlikely.
- 5) Prevention is the best course of action against invasive species. Management plans, education programs and regulations are strategies that can help in the fight against AIS.

The Plan includes AIS program focus areas and needs, identifies the proper management actions, details current authorities and programs, and sets objectives that will lead to the accomplishment of the Plan's goals. These objectives include:

- Coordination and implementation of an AIS Management Plan
- Prevent the introduction of AIS into and within Montana
- Early detection and monitoring aquatic invasive species in Montana
- Rapid Response preparedness
- Control and eradication of aquatic invasive species where feasible
- Provide outreach and education to expand public understanding, and promote behavior change
- Periodic evaluation of AIS laws and rules






Problem Definition

Overview

Each region of the country is challenged with different invasive species issues due to multiple variables. Variables such as suitable climate, available habitat, and human behaviors, among others, can influence invasive species success and establishment. Landlocked and north of the 45th parallel, Montana is in a semi-arid climate often characterized by short dry summers where snow can fall virtually every month of the year. These considerations will inform the suitability and expectations of invasive species that may be able to establish in Montana.

There are multiple aquatic invasive species present in Montana waters. The Montana Natural Heritage Program (MNHP) serves as the data repository for species occurrence and species of concern for the state. The MNHP database captures species records for native¹, extirpated, non-native and information on species that are not yet established in the state but pose a threat. The MNHP repository indicates 114 non-native aquatic species with 85 of those as established and 29 as not yet established but pose a threat in Montana (MNHP 2024). The MNHP current record of species indicates roughly two-thirds of those records representing fish species. The majority of the non-native fish present in Montana are associated with fishery management intentional stocking by FWP. However, there are multiple circumstances where known illegal fish plantings or aquarium release have resulted in established fish species. The remaining records of non-native species are 18 aquatic plants, ten mollusks, two crustaceans and two amphibians (Table 1). In addition to the species indicated in the MNHP database, the U.S. Geological Survey (USGS) Nonindigenous Aquatic Species (NAS) Database also houses data regarding species presence and historic reports of species that may have failed to establish a reproducing population. It is also possible that some of the very early historic records were the result of misidentification, particularly with some aquatic plants.

Table 1. Non-native aquatic species recorded in the Montana Natural Heritage Program database.

Non-Native Aquatic Species in Montana		Species Records
Fish Species		53
Aquatic Plant Species		18
Mollusca Species		10
Crustacean Species		2
Amphibian Species		2

¹ The term **Species of Concern** is used to describe species of conservation value, specifically “any species, designated by FWP and MNHP as having particular threats, declining population trends, or restricted distribution warranting special attention.”

Montana Aquatic Invasive Species Management Plan

The 20th century in Montana was a time for many non-native species first records. One of the earliest AIS recorded in Flathead Lake was flowering rush (*Butomus umbellatus*) in 1962 which at the time was available as an ornamental garden plant. Flowering rush has spread and moved downstream into the Columbia River Basin. While Eurasian watermilfoil (*Myriophyllum spicatum*) and curly leaf pondweed (*Potamogeton crispus*), were both detected in the 1970s, these records may have been a result of misidentification or failed establishment. Regardless, these species are now established in various waters and are likely introduced from aquarium release, or as fragments on trailered watercraft (Parkinson et al. 2016). The management of Eurasian watermilfoil (*M. spicatum*) in the Jefferson and Clark Fork Rivers in southwest Montana, and Fort Peck Lake in eastern Montana have involved multiple year efforts to suppress population growth (Figure 5).

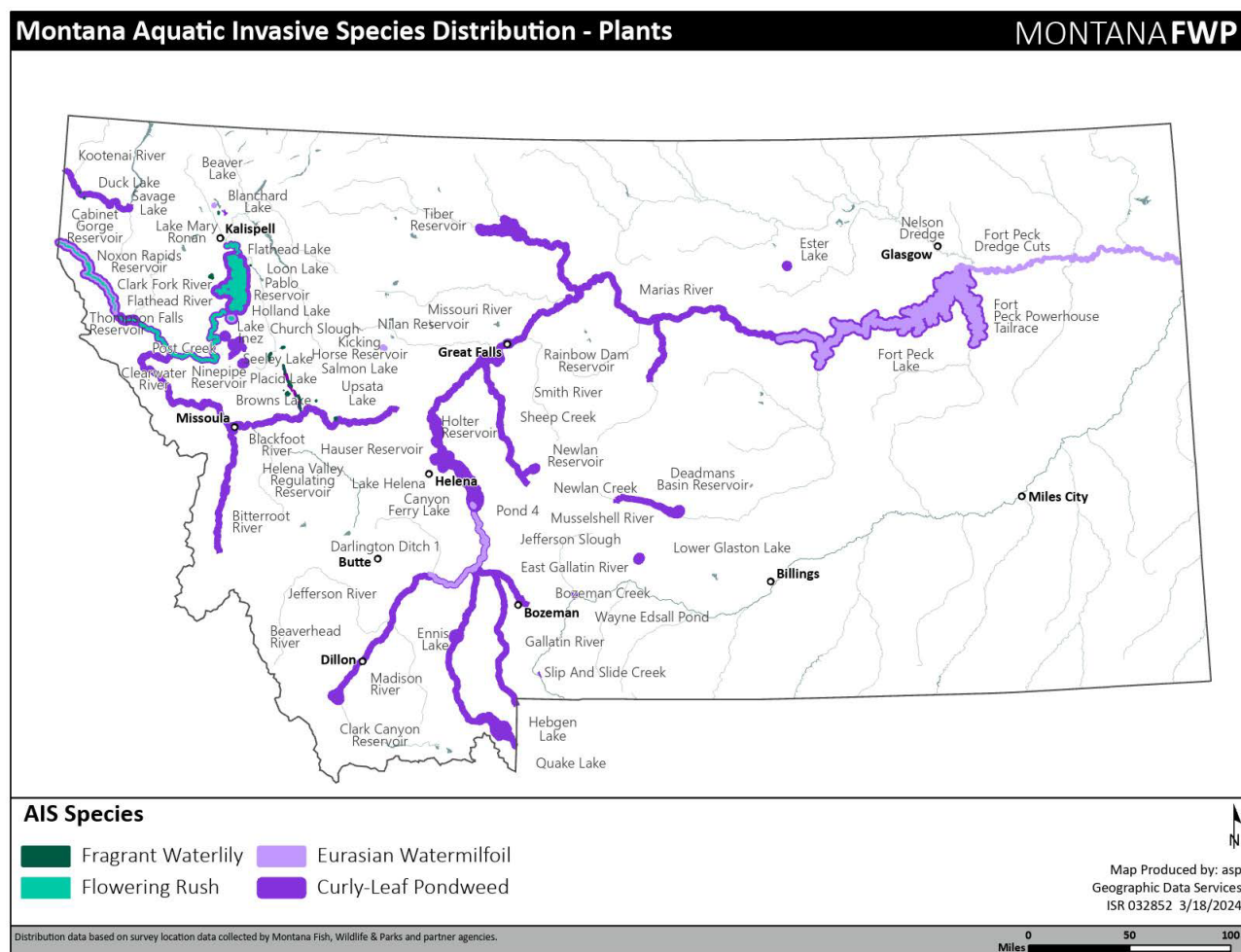


Figure 5. The distribution of select aquatic invasive plant species in Montana waters. Species include Fragrant waterlily, flowering rush, Eurasian watermilfoil, and Curly-leaf pondweed.

Other notable invasive species detections that prompted significant management response to limit their spread were *Myxobolus cerebralis* (the parasite that causes whirling disease) in 1994 and New Zealand mudsnails (*Potamopyrus antipodarum*) in 1995. Record salmonid fishery declines due to *M. cerebralis* in multiple Montana rivers were linked to hatchery fish introductions which ceased in the 1990s.

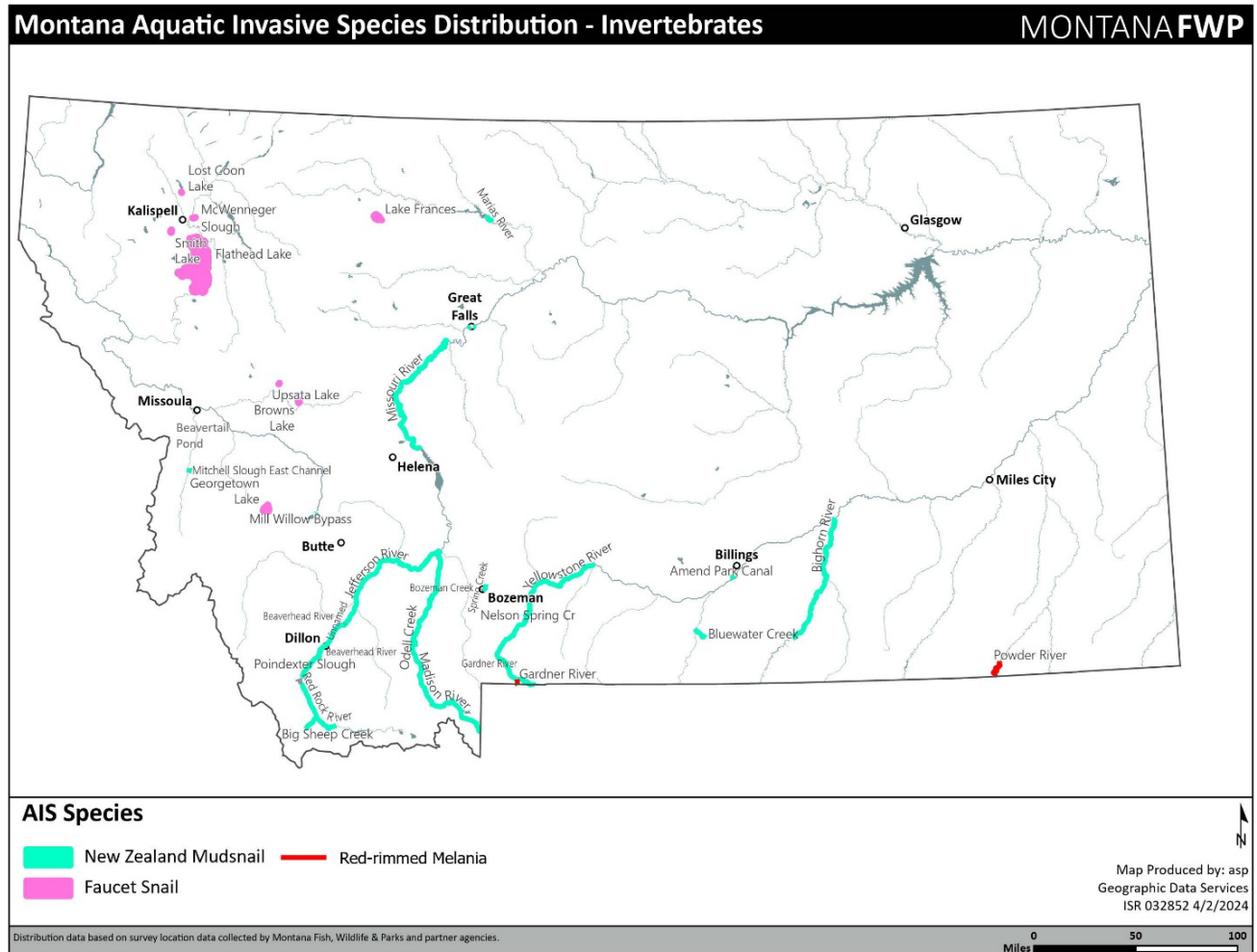


Figure 6. The distribution of select aquatic invasive invertebrate species in Montana waters. Species include New Zealand Mudsnail, Red-rimmed Melania, and faucet snail.

Mudsnails, whose introduction was linked to recreation activities including angling, initially triggered multiple river access closures. Recent detections of mudsnails in 2020 were the first detection in Montana west of the Continental Divide (Figure 6). American bullfrog (*Lithobates catesbeianus*) was also detected in the mid-1990s in multiple rivers. While this amphibian is native in the eastern US, it has been suggested that their introduction in the western US and in Montana is due to their use as a recreational hunting and food item, and aquarium release. Finally, the freshwater clam (*Corbicula fluminea*) was detected in Lake Elmo in 2019 and has resulted in a multi-year effort to eradicate this population and prevent further spread. This occurrence is suspected to be linked to a contaminated boat or an aquarium release.

A rare turtle species native to eastern Montana, the snapping turtle (*Chelydra serpentina*) appears to be expanding in western Montana. This new distribution of the turtle has resulted in negative impacts to species due to their predatory behavior. This hop over the Continental Divide is thought to be the result of human introduction through pet release.

Ecological and Economic Impacts

When species are introduced into a new environment there is the potential for significant ecological, economic, and social impacts. The establishment of new species can disrupt ecosystems where introduced species may prey upon, compete, or hybridize with native species, and transmit diseases to the native species, as well as alter habitats. Introduced species may also impact economic dynamics such as increased fees or permits associated with recreation, loss of income due to the loss of recreation opportunities, additional costs for irrigation or agricultural operations, and municipalities for water supply delivery. Finally, the introduction of an invasive species can create new regulations or compliance for water users.

Historic economic impact estimates have suggested that the damages and losses incurred by invasive species in the United States were \$120 billion annually (Pimentel et al. 2005). More recent estimates suggest that those annual impacts are closer to \$26 billion annually (Crystal-Ornelas et al. 2021, Diagne et al. 2022). While these assessments can provide context to the economic resources required to address invasive species, keep in mind these assessments encompass invasive species across a range of taxa and various economic scenarios. Regardless, the economic burden of aquatic invasive species at a local level can negatively impact infrastructure, create restrictions for human activity, create situations for loss of revenue, and reduce real estate values.

The scale of invasive species impacts can take a variety of forms. For example, invasive dreissenid mussels can affect all facility components exposed to raw water; mussels can clog pipelines and water intakes and disrupt operations at hydroelectric power plants, municipal water supply facilities, and conveyance systems used in irrigation, resulting in water lines incapable of supplying a consistent and reliable source of water (Vissicelli 2018). Invasive mussels pose serious threats to hydropower infrastructure and operations (Rumzie et al. 2021). Surveys have been conducted to examine the operational costs associated with dreissenid mussels at multiple hydropower facilities in the US. The dreissenid-associated maintenance expenses for nine federal hydropower facilities are approximately \$464,000 annually (Bureau of Reclamation 2021). Finally, an economic cost estimate conducted in 2018 by the University of Montana evaluated potential costs associated with zebra or quagga mussel introduction into the state. The report assessed costs associated with dreissenid mussel impacts to infrastructure, habitat, property values and tourism. The results of the study estimated \$72.4 to \$121.9 million in annual mitigation costs, \$23.9 to \$112.1 million annual in lost revenue and \$288.5 to \$497.4 in property losses (Nelson 2019).

In addition to dreissenid mussel impacts, invasive aquatic plants can obstruct irrigation flow and block recreation opportunities. Invasive aquatic plants pose additional economic impacts such as algal blooms, and degraded water quality due to excess nutrients which influence home sale price (Ara et al. 2006, Horsch and Lewis 2009; Zhang and Boyle 2010; Walsh et al. 2011; Bingham et al. 2015; Baron et al. 2016). For example, in multiple Vermont lakes, the presence of milfoil and native aquatic vegetation decreased property value ranging from 0.3 percent to 16.4 percent depending on the degree of total plant coverage (Zhang and Boyle 2010). AIS can also have a significant impact on recreation and aquatic ecosystems, potentially impacting tourism, and property values.

Climate Change and Invasive Species

According to the Montana Climate Assessment, between 1950 and 2015, Montana average temperature increased by 2.7°F (Whitlock et al. 2017). The effects of climate change can be apparent in the dynamics of hydrology such as decreased snowpack, declining seasonal waterflow and warmer water temperatures (Luce 2017). This decrease in snowpack results in decrease availability of water (Environmental Protection Agency 2016) not only for functioning ecosystems, but for agriculture and recreational uses as well. The consequences of climate change on aquatic ecosystems may also result in shorter periods of ice cover on lakes, and warmer summer water temperatures which can result in a loss of habitat for cold-water fisheries (Woolway et al. 2022), such as salmonids.

These changes in hydrology allow for shifts in species distribution range and can create new opportunities for invasive species to spread. Warmer water temperatures that were previously unsuitable for some species can now allow for their establishment (Rahel and Olden 2008). Other synergistic consequences within a changing climate could allow species that previously were not considered invasive to be enhanced. In this scenario, non-native species that may already be present, but currently limited in population size, may expand rapidly under new climatic conditions, and become invasive (referred to as sleeper species) (Bradley et al. 2018). Additionally, warmer temperatures may extend the boating season, extending the season and opportunities for watercraft to transport and introduce AIS.

To adapt to changes in climate, it is important to not dismiss a species because previous risk assessments have indicated that conditions were unsuitable in Montana. Montana is proactively taking steps to prohibit the sale of species that have exhibited invasive behavior in more temperate locations. Identifying species that have exhibited invasiveness in other places and addressing the vectors that can bring them to the state is a proactive method to help prevent introduction. Multiple efforts to create global scale screening of non-native species can be used to identify potential threats to Montana (e.g., Lee et al. 2008, Vilizzi et al. 2021).

The Montana Climate Solutions Plan highlights that adaptation to climate change will require conservation and enhancement of rivers, stream, lake and riparian areas, and continued monitoring, early detection and rapid response to invasive species detections to mitigate the impacts of climate change (State of Montana 2020). Climate change and invasive species are increasingly viewed as synergistic variables that will influence freshwater ecosystem biodiversity and their resilience (Mainka and Howard 2010, Ricciardi et al. 2021, Invasive Species Advisory Committee 2023). Despite this connection, incorporating climate considerations into invasive species management (and vice versa) has been limited. However, recent work provides suggestions to better incorporate and plan for climate-mediated invasive species challenges (Beaury et al. 2020, Colberg et al. 2024). The climate change-invasive species synergy challenges that have been identified include species range shifts, new pathways and transport fostering new introductions, shifting seasons that alter management planning, changes in invasive species treatment efficacy, changes in the vulnerability of native ecosystems and integration of invasive species considerations associated with extreme climate events (Colberg et al. 2024). A cursory

exploration of these challenges can allow Montana to be better prepared for invasive species management under a changing climate and adhere to climate-smart invasive species management.

1. The challenges of species range shifts and awareness of new pathways stress the importance of active early detection and monitoring programming. Robust, consistent and comprehensive efforts to actively search for new potential invasive species can address this. Montana relies on a collaborative effort by state agencies, Tribes, researchers, regional conservation groups and curious residents to conduct early detection efforts. Maintaining these critical monitoring efforts will be needed.
2. Shifting seasonal conditions present a multitude of situations to be addressed. In a warming climate, it may be possible for invasive species to complete multiple reproductive cycles in a season which in turn may require different strategies for control regimes to be successful. Further, longer favorable seasonal conditions could result in potentially longer boating seasons. This may prompt a need to alter workforce seasons or commitments to provide watercraft inspection prevention efforts for a longer time period.
3. Potential challenges with invasive species treatment efficacy may be observed as being unable to anticipate seasonal freezing conditions that have been previously used to successfully negatively impact invasive species populations. There are multiple examples of AIS control efforts that have previously relied on freezing temperatures to reduce or destroy invasive species populations in various waterbodies. Other control strategies may have to be explored.
4. Changes in the vulnerability of native ecosystems under the stress of a changing climate and invasive species may require adjustments to management strategies to protect critical native species and their habitats. A better understanding of how climate change and AIS will affect specific native aquatic species that are important to Montana could help prioritize future management efforts.
5. Finally, extreme climate events, such as drought, wildfire and flood, present opportunities for invasive species to be introduced or spread. Emergency planning efforts would benefit from consideration of invasive species to prevent introduction or spread both pre- and post-extreme event. Additionally, wildfire incidents where dense smoke or restricted access may affect the ability of workers to safely implement AIS management activities. These conditions could put people at risk or limit their ability to conduct critical AIS management activities such as watercraft inspection or monitoring. The development of strategies or guidelines to ensure AIS prevention activities are upheld when faced with extreme climate events should be considered.

Adapting to changes in climate and successfully managing AIS will require adaptive measures, innovative approaches and collaboration across many entities in Montana.

Risk Assessment and Prioritization

Montana utilizes risk assessments from other jurisdictions in similar climates to gauge the threat of AIS species to Montana waters. AIS risk assessments conducted by U.S. Fish and Wildlife Service, such as Ecological Risk Screening Summaries, and the status of AIS in various Midwestern states are utilized to identify priority species for management in Montana. These assessments influence the species that may be ultimately listed on the Montana Exotic and Prohibited Species List and also those species prioritized for management response if detected.

Beginning in 2017, FWP began a state-wide assessment to evaluate the risk of dreissenid invasion into Montana waters. Conducted every 3 years, this assessment uses water quality data coupled with watercraft use data to characterize the relative risk that Montana waterbodies may face for dreissenid introduction. The initial assessment determined that the majority of Montana waters are suitable for dreissenid establishment. The waterbodies that are at highest risk for dreissenid invasion are Flathead Lake and Fort Peck due to high levels of out-of-state watercraft use and favorable water chemistry. This information guides the 3-year monitoring plan and prioritization of waterbodies for monitoring.

Prioritizing Pathways and Threats

A dual approach of vector management and species prioritization creates a highly effective strategy to address invasive species in Montana. Pathways and species can be examined by a specific process to better understand the risk they pose to Montana resources. The ANSTF and the National Invasive Species Council developed a pathway prioritization tool that can help guide decisions (2007). The level of risk that a pathway or species poses can help form management actions. A classification system for the identified pathways and species is helpful to aid in prioritization of financial and natural resources (Table 2). Consideration of human effort, fiscal needs and logistical practicality play a role in this determination.

It must be recognized that for some pathways and species there is a lack of scientific knowledge or limited public knowledge, which further complicates the exercise of prioritizing pathways and species. The risk classification must rely on the best available information and scientific knowledge but may be subject to change based on new information. Consideration of policy and human values associated with the relative risk that a pathway or species poses may also influence the prioritization process. Therefore, an important aspect of this process should include clear communication on risk assessment evaluations (Andersen et al. 2004).

If a pathway or species leads to high risk assessment, then the lead agency will formulate a management action based on the best available information to structure an appropriate response (or non-response).

Table 2. Pathway and species prioritization require consideration of multiple areas of information to identify the level of risk posed.

Information and Knowledge for Prioritization	
PATHWAYS	SPECIES
<ul style="list-style-type: none"> a. Level of risk the pathway poses to species introduction and species spread b. Ability to physically and legally control or intercept a pathway c. Volume/activity created by pathway 	<ul style="list-style-type: none"> a. Likelihood of introduction b. Species survival c. Established presence or absence in Montana, and geographic proximity to other populations d. Environmental impacts caused following establishment e. Economic impacts caused following establishment f. Risk the species poses to the health or safety of the public, wildlife, and cultured animals, and waterbodies g. Ability to readily control or contain the species once established or detected.

Pathways

Ballast water discharge from ships is the most significant source of unintentional introductions of AIS to the United States in coastal and estuarine waters. Species introduced into the US through the ballast water pathway pose a serious threat in Montana as smaller watercraft and other vehicles traveling overland may transport invasive species to Montana waters. Aquatic invasive species, such as zebra or quagga mussels (*Dreissenidae* species), which were originally introduced to the US by ballast water, can attach to watercraft or be moved in the live wells or ballast tanks from one body of water to another.

There are many other pathways that may also introduce AIS that are both unintentional and intentional. Water diversions allow species from different drainages to invade new habitats potentially causing serious problems. Importation of animal and plant species through the aquarium and horticulture trade and their subsequent release can put bodies of water at risk for invasion. Construction activities also provide opportunities for the introduction and spread of species from barges, large equipment, pumps and water conveyances. And although aquaculture is well regulated in Montana, animal propagation and pathogens associated with this industry are still a potential source for AIS.

The primary strategy for preventing AIS spread and introduction is the identification and subsequent mitigation of pathways. Various sectors of the recreating public, agency field activities and construction and commercial activities all play a critical role in the potential spread of a species. By identifying appropriate pathways and their associated risks, significant management success can be realized. Vectors are pathways that aid in the spread of aquatic invasive species. There are a variety of ways that invasive species can be spread including natural dispersal and recreation, commercial and industrial activities. However, some vectors pose a greater risk for AIS spread and are a higher priority to address.

It is helpful to categorize vectors into different activities and entities to aid in prioritizing management action. When high risk vectors are identified this creates a better structure for management efforts and improves the management agency's ability to control the movement and introduction of AIS. By addressing the pathways of introduction for "priority species", the introduction of other lower priority or perhaps unidentified AIS, may also be prevented because many share common pathways of introduction. Montana's adoption of the Hazard Analysis and Critical Control Point (HACCP) standard provides a reference point to reduce or eliminate the spread of unwanted species during specific processes or practices, or in materials or products.

The following have been identified as the highest risk vectors and pathways.

Fishing and Recreation Activities

Recreational activities such as boating, hunting and fishing are popular activities that define the Montana way of life. Virtually any recreational activity and equipment that comes in contact with water that is not properly cleaned has the potential to spread species. Recreational watercraft and trailers have been identified as a significant vector for the movement and introduction of AIS (Johnson et al. 2001, Mari et al. 2011). Additional vehicles or equipment that may spread AIS includes all-terrain vehicles, float tubes, waders, waterfowl decoys, and non-motorized watercraft. Addressing recreational watercraft through a robust watercraft inspection program targeting high risk watercraft / high traffic corridors has been identified as one of the most effective tools for addressing the spread of AIS.

Live bait use in Montana may also be a source of AIS introduction and spread. Live bait fish are regulated in Montana and may not be imported into the state. Possession of live bait is prohibited in the Western Fishing District but allowed elsewhere under specified rules. To prevent the spread of *M. spicatum* from infested waterbodies, bait restrictions are in effect in the Central and Eastern Fishing Districts.

Fishery and Wildlife Enhancement

The fisheries of Montana are of great significance economically and ecologically. Montana has its own history of intentional legal and illegal introductions of nonnative species to enhance local fishing opportunities. At the turn of the century, thirty-six species of fish were considered native (Henshall 1906) to the waters of Montana. Throughout the 1900s introductions to enhance fisheries opportunities resulted in the establishment of many sport fish, such as brown trout (*Salmo trutta*) and largemouth bass (*Micropterus salmoides*). A management shift in the 1970s fostered self-sustaining wild trout populations (Vincent 1972) and intentional introductions ceased to Montana rivers. Illegal stocking of non-native fish species can also introduce AIS. A statewide partnership supports a reward program for reporting illegal release of fish. Lastly, private ponds may stock non-native fish, such as koi and goldfish, under a permit issued by FWP. Despite permit requirements, private ponds that are stocked with non-native fish and other invertebrates may be a possible source for species introduction.

State and federal hatcheries in Montana have protocols in place to limit the spread and introduction of invasive species associated with hatchery operations. The FWP Fish Health Program samples both hatchery and wild fish populations for pathogens and AIS using standardized methods. The hatchery system also undergoes annual fish health and AIS inspections. FWP has developed site-specific AIS and

fish health inspection plans and conducts regular biosecurity assessments. Additional biosecurity measures have also been incorporated into all of Montana's fish hatcheries. However, some conditions may be unavoidable. For example, surface water that is utilized by a hatchery may be a source of AIS that may enter a hatchery which can have unintended impacts. The development and implementation of monitoring protocols for AIS in state facilities has played a key role in mitigating this as a potential pathway for AIS.

Commercial Transportation of Vehicles or Equipment

The commercial transportation or delivery of recreational boats, construction vehicles and other commercial equipment, such as floating docks, can introduce AIS into new waters. Carefully monitoring the transport or delivery of vehicles or equipment within Montana is an important aspect of prevention. Proactive coordination with transportation businesses is a critical component to limiting the threat of this vector. FWP frequently identifies commercially transported watercraft fouled with invasive dreissenid mussels. In 2023, one-quarter of the vessels that were intercepted with dreissenid mussels attached were commercially hauled watercraft.

Organisms in Trade

There are many retail markets within Montana that may be a potential source of invasive species and represent a significant risk to species introduction. Retail industries, such as aquarium and pet stores, nursery and garden centers, and mail order and internet suppliers offer a variety of fish, snails, aquatic and terrestrial plants some of which may be invasive species (Padilla and Williams 2004, Olden et al. 2021, Lockwood et al. 2019). Contaminant species can also hitchhike on or in aquarium or nursery stock. For example, in 2021, Marimo moss balls contaminated with zebra mussels were found across North America in pet stores (including Montana) and subsequently broadened management perspectives of this pathway as a significant pathway (Pacific States Marine Fisheries Commission 2021). Populations of Asian clam (*Corbicula fluminea*) in Lake Elmo and American bullfrog (*Lithobates catesbeianus*) on the Yellowstone River are assumed to be a result of intentional release from purchased species.

Private fish hatcheries which can supply fish to the public can also be a source of invasive species. Both non-native fish species and pathogens of concern have the potential to enter state waters via this market. Marketplaces that offer species for use in educational settings have frequently been identified as means to easily obtain invasive species for classroom use. With the use of Montana's List of Prohibited Species and Fish Health screening, a level of protection is afforded. Despite this, there are still areas in retail markets that represent a risk to Montana waters.

Field Activities

Many entities conduct activities on Montana's waterways for a variety of reasons, including school groups, researchers, agencies and Tribal monitoring programs, and education events. Specifically, the state and federal resource agencies in Montana spend numerous hours on different waterbodies collecting water quality parameters and information on the species present. Any agency that conducts field work in Montana waters is a potential source for moving invasive species among and between waters. Additionally, education events and school groups may conduct activities that may either

introduce or spread invasive species. Internal education for many of these agencies and as well as providing simple guidelines for others regularly conducting activities on the water can target this risk.

Industrial Activities

The construction of new roads, placement of culverts or bridges, energy development projects, and other activities where construction vehicles are entering water and then traveling to another location to do work are potential pathways for spreading AIS. Construction, mining or industrial vehicles and equipment that travel from outside the state represent a potential pathway for invasive species introduction. Water trucks used for dust control, site preparation, or other industrial projects are vectors that may transport and introduce AIS. Ensuring that vectors from industrial activity can be minimized is challenging yet important as industrial development is a constant and expanding activity throughout the state.

Landowner and Agriculture Activities

Landowners of Montana rely extensively on water to irrigate agricultural crops and feed animals with over 7,500 irrigated farms and more than 20,000 miles of conveyance ditches and canals to transport water (Lonsdale et al. 2020). Irrigation equipment may be a vector for moving AIS and therefore ensuring landowners are aware of appropriate steps to take on their private property aids in the protection of public land resources that may be adjacent to private landowner activities. Purchase and transport of used irrigation equipment can also move AIS. Conscientious cleaning of equipment to minimize spread of AIS among waterbodies can be addressed by providing landowners with proper information.

Private landowners conducting land modification projects within the riparian zones play a role in AIS prevention and spread. Consequently, Montana Natural Streambed and Land Preservation Act (310) permits are required for any work below the high-water mark. The 310-permit program is administered by conservation districts in partnership with DNRC and FWP. The permit includes conditions that require project equipment to meet AIS inspection requirements.

Biological Control

Biological control is an integrated pest management strategy by which species populations may be regulated by using natural predators and pathogens. The management strategy implies the introduction of one species to manage another. In Montana, several terrestrial noxious weeds have been addressed with the introduction of non-native insect species. On-going explorations to address the extensive infestation of flowering rush (*Butomus umbellatus*) in the Columbia River Basin has included biological control. It is possible that biological control methods, despite a very rigorous federal approval process, could allow for a non-native species to become established.

Natural Disasters

There are natural disasters or emergency activities that managers may not have control over but can anticipate that these pathways may be significant sources of invasive species introduction or spread. Activities such as wildland firefighting that use water from lake or river sources, flood events where water moves beyond the banks, and other natural disaster or emergencies may bring high traffic into

the state somewhat uncontrolled or other activities that promote invasive species spread. Considering possible scenarios that may occur and anticipating how to address possible pathways generated by these scenarios is an important part of invasive species prevention. Controlling wildland fires has increasingly been identified as a possible mechanism in the introduction or spread of invasive species. Montana has worked to address wildland firefighting in AIS prevention by encouraging the adoption of prevention protocols (National Wildfire Coordinating Group 2018).

Free-flowing Water

The natural flow of water serves as a means for aquatic invasive species to spread to new areas, by either upstream or downstream dispersal. This natural aspect of species spread is largely out of the control of managers but is recognized as a means for species spread.



AIS of Interest

Historically, invasive species management has been species-specific focused. This approach can be appropriate particularly when there are circumstances for successful eradication of a species found early in their establishment. However, pathway management allows for broader protection of Montana resources and addresses species that may not yet be identified as a threat. A list of species that threaten Montana is based on existing data and fall into two areas, species that are present (Table 3) and not present in the state (Table 4).

Table 3. Invasive pathogen, plant and animal species present in Montana (2024). Fifty species of fish have been classified as non-native, but none are listed here. For a complete list, reference the Montana Natural Heritage Field Guide.

Non-native Aquatic Species Present in Montana	
Category	Species Name
Pathogens	Parasite that causes whirling disease (<i>Myxobolus cerebralis</i>) Parasite that causes proliferative kidney disease (<i>Tetracapsuloides bryosalmonae</i>) Amphibian chytrid fungus (<i>Batrachochytrium dendrobatidis</i>)
Aquatic Plants	Brook pimpernel (<i>Veronica anagallis aquatica</i>) Curly-leaf pondweed (<i>Potamogeton crispus</i>) Eurasian watermilfoil (<i>Myriophyllum spicatum</i>) Flowering rush (<i>Butomus umbellatus</i>) Fragrant Water-lily (<i>Nymphaea odorata</i>) Marshpepper smartweed (<i>Polygonum hydropiper</i>) Onerow watercress (<i>Rorippa microphylla</i>) Pond water starwort (<i>Callitriche stagnalis</i>) Purple loosestrife (<i>Lythrum salicaria</i>) True forget-me-not (<i>Myosotis scorpioides</i>) Watercress (<i>Rorippa nasturtium aquaticum</i>) Yellow flag iris (<i>Iris pseudacorus</i>) Yellow floating heart (<i>Nymphoides peltata</i>) Spiny naiad (<i>Najas marina</i>) European common reed (<i>Phragmites australis</i> ssp. <i>Australis</i>) Narrow-leaved cattail (<i>Typha angustifolia</i>)
Aquatic Animals and Invertebrates	American bullfrog (<i>Lithobates catesbeianus</i>) Asian Clam (<i>Corbicula fluminea</i>) Black sandshell (<i>Ligumia recta</i>) Big-eared radix (<i>Radix auricularia</i>) Chinese mystery snail (<i>Cipangopaludina chinensis</i>) New Zealand mudsnails (<i>Potamopyrgus antipodarum</i>) Mapleleaf (<i>Quadrula quadrula</i>) Mimic lymnaea (<i>Pseudosuccinea columella</i>) Mud Bithynia (<i>Bithynia tentaculata</i>) Red-eared slider (<i>Trachemys scripta</i>) Red-rim Melania (<i>Melanoidea tuberculatus</i>) Snapping turtle (<i>Chelydra serpentina</i>) Southern Plains crayfish (<i>Procambarus simulans</i>) Virile crayfish (<i>Faxonius virilis</i>) White heelsplitter (<i>Lasmigona complanata</i>)

All invasive species noted in the Montana Natural Heritage Program database are coupled with a rank and associated definition. Invasive species ranked as status not applicable (SNA) which includes the definition: A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities because of being: 1) not confidently present in the state; 2) non-native or introduced; 3) a long-distance migrant with accidental or irregular stopovers; or 4) a hybrid without conservation value. Species of concern that are considered not in Montana may also be labeled as Not Documented which is a species that has not been documented in Montana. However, it may either be present and undocumented or may potentially invade the state due to presence in the surrounding region.

Table 4. Invasive pathogen, plant and animal species not documented in Montana (as of 2024) and are a priority for management action.

Species of Interest (non-native invasive) and Not Documented in Montana	
Category	Species Name
Pathogens	Virus that causes Viral hemorrhagic septicemia
Aquatic Plants	Brazilian waterweed (<i>Egeria densa</i>) Brittleleaf naiad (<i>Najas minor</i>) Common water hyacinth (<i>Eichhornia crassipes</i>) European frog-bit (<i>Hydrocharis morsus-ranae</i>) Fanwort (<i>Cabomba caroliniana</i>) Hybrid cattail (<i>Typha x glauca</i>) Hydrilla (<i>Hydrilla verticillata</i>) Parrot feather watermilfoil (<i>Myriophyllum aquaticum</i>) Starry Stonewort (<i>Nitellopsis obtusa</i>) Yellow floating heart (<i>Nymphoides peltata</i>)
Aquatic Animals and Invertebrates	Bighead carp (<i>Hypophthalmichthys nobilis</i>) Black carp (<i>Mylopharyngodon piceus</i>) Fishhook waterflea (<i>Cercopagis pengoi</i>) Grass carp (<i>Ctenopharyngodon idella</i>) Northern snakehead (<i>Channa argus</i>) Quagga mussel (<i>Dreissena bugensis</i>) Red swamp crayfish (<i>Procambarus clarkii</i>) Round goby (<i>Neogobius melanostomus</i>) Ruffe (<i>Gymnocephalus cernua</i>) Rusty crayfish (<i>Faxonius rusticus</i>) Silver carp (<i>Hypophthalmichthys molitrix</i>) Tench (<i>Tinca tinca</i>) Zander (<i>Sander lucioperca</i>) Zebra mussel (<i>Dreissena polymorpha</i>)

The species that have been identified to present the highest risk to the state of Montana include dreissenid mussels (Dreissenidae), hydrilla (*Hydrilla verticillate*) and starry stonewort (*Nitellopsis obtusa*). The primary vector for transport and introduction of these species is watercraft. Invasive carp

(*Hypophthalmichthys nobilis*, *H. molitrix*, *Mylopharyngodon piceus*, *Ctenopharyngodon idella*) are also high priority species that threaten Montana waters. The primary vector for movement of invasive carp would be transport as live bait. Live bait from out of state is prohibited and requirements emphasize actions for anglers to help address this pathway.

Prohibited and Controlled Wildlife and Fish Species

There are species of interest that Montana Fish, Wildlife & Parks has categorized in statute for management as Exotic which are any species that is not native to that ecosystem. There are three categories under Exotic; Controlled, Noncontrolled and Prohibited. All exotic species are indicated in Appendix B.

Controlled species means live, exotic wildlife species, subspecies, or hybrid of species that may not be imported, possessed, sold, purchased or exchanged in Montana unless a person obtains written authorization from the department. Controlled exotic species are indicated in [Administrative Rules of Montana (ARM) 12.6.2208 & ARM 12.6.2204]. Examples of species listed as exotic controlled are koi (*Cyprinus carpio*) and goldfish (*Carrassium auratus*).

Noncontrolled species are live, exotic wildlife species, subspecies, or hybrid of that species that may be possessed, sold, purchased or exchanged in the state without a permit, except as provided in this subchapter or in Montana statutes or federal statutes. An uncontrolled species may not be released into the wild unless authorized in writing by the department. This definition does not authorize the sale, possession, transportation, importation or exportation of a noncontrolled species in violation of any applicable federal or state statute or regulation or county or city ordinance. Noncontrolled exotic species are indicated in [MCA 87-5-706 & ARM 12.6.2205]. An example of species that are classified as exotic noncontrolled are all tropical fish for use in residential aquariums.

Prohibited species are live, exotic wildlife species, subspecies, or hybrid of that species, including viable embryos or gametes, that may not be possessed, sold, purchased, exchanged, or transported in Montana, except as provided in [MCA 87-5-709] or [ARM 12.6.2220]. Many of the species classified as prohibited are considered aquatic invasive species. Some of the species classified as prohibited are *Dreissena polymorpha*, *Dreissena bugensis*, *Trachemys scripta elegans*, *Orconectes rusticus* and multiple genus of invasive carp fishes. Exotic wildlife that are not classified are prohibited under [MCA 87-5-705]. Prohibited exotic species are indicated in [ARM 12.6.2215, AMR 16.6.1540, MCA 87-5-71 & MCA 50-23-101].

Noxious Weed List

The Montana Department of Agriculture (MDA) designates plant species as noxious or regulated. As of 2019, a total of 36 noxious weeds and 5 regulated species are classified. The 36 species fall into 4 management categories: Priority 1A, Priority 1B, Priority 2A, Priority 2B, and Priority 3 (Regulated Plants). Nine of these identified species are aquatic. The Noxious or Regulated plant species are found in Montana Code Annotated [MCA 7.22.21] and Appendix C.

Plan Goal

The goal of the Montana AIS Management Plan is to minimize harmful ecological, economic, and social impacts of AIS through prevention and management of AIS into, within and from Montana. The goal will be achieved through full implementation of the Plan objectives to prevent, control, contain, detect, limit, and whenever possible eradicate AIS from the waters of Montana. The Plan emphasizes the collaboration of state agencies, with federal and Tribal governments, and many partners to address AIS in Montana (Figure 7).

Existing Authorities and Programs

Clearly defining authority is an important part of an effective and efficient AIS program. For the state of Montana, FWP is the lead agency involved with AIS program operation and coordination, but many other agencies have authority in AIS issues. The authorities for Federal and State agencies, Tribes and other entities are outlined below.

Federal Authorities and Programs

No single federal agency has complete authority over all aspects of AIS management, but many federal agencies have programs and stewardship responsibilities that relate to or include AIS management. Montana is comprised of 29% federally owned land (27.1 million acres), and the federal-state coordination efforts to manage AIS are relevant to the larger management overview of AIS in the state. Management of surface water is largely managed by the state.

Nationally, federal activities on AIS management are coordinated through the ANSTF. In February 1999, President Clinton signed Executive Order (EO) 13112, which requires all federal agencies to collaborate to develop a national invasive species management plan that includes terrestrial and aquatic species. The EO was amended in 2016 by President Obama and extended the scope of the initial EO. Included below are brief descriptions of the many federal authorities and programs with relevance to Montana. A more comprehensive list of Federal Authorities can be found in Appendix D.

Lacey Act

The Lacey Act of 1900 (Title 16 of U.S.C. 3371-3378 and Title 18 of U.S.C. 42-43) (as amended) is the oldest national invasive species law in the United States. Title 16 of the Lacey Act makes it illegal to import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken, possessed, transported, or sold in violation of any law, treaty, or regulation of the United States, any State, Native American tribe, or foreign nation. This provision of the Lacey Act essentially ensures reciprocity of fish and wildlife and plant laws across jurisdictions. Since many jurisdictions have laws pertaining to invasive species, Title 16 can be used to impose federal penalties for possessing or transporting invasive species.

Title 18 of the Lacey Act is known as the Injurious Species Provision, as it authorizes the USFWS to list by regulation certain invasive or otherwise harmful wildlife species, thereby prohibiting their importation into the United States, its territories and possessions, the District of Columbia, or Puerto Rico. It also

Montana Aquatic Invasive Species Management Plan

does not allow for any shipment between the continental United States, the District of Columbia, Hawaii, Puerto Rico, or any possession of the United States. Species are added to the injurious species list through the regulatory process, which includes public input, usually based on criteria that address the likelihood of introduction and potential impacts. AIS species listed as injurious that are of particular concern to Montana include the zebra and quagga mussels *Dreissena polymorpha*, and *Dreissena rostriformis bugensis*; Snakehead fishes (Family Channidae); and numerous invasive carp species (bighead, black, silver).

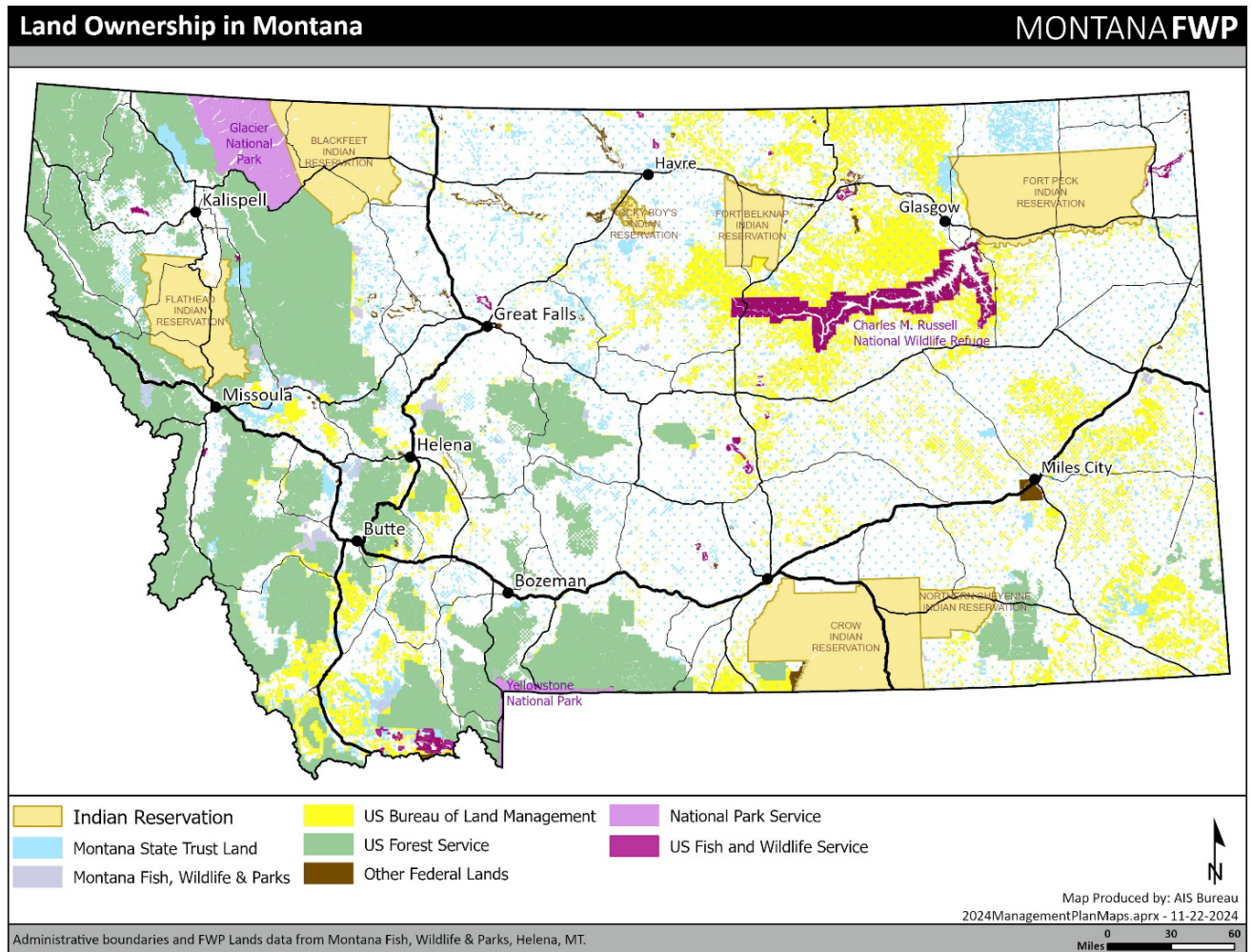


Figure 7. Land ownership in Montana includes multiple Tribes, Federal, and State entities.

Executive Order 13112

President Clinton signed Executive Order 13112 on Invasive Species (64 FR 6183), on February 3, 1999. The Executive Order seeks to prevent the introduction of invasive species, provide for their control, and minimize their impacts through better coordination of federal agency efforts under a National Invasive Species Management Plan to be developed by an interagency Invasive Species Council. The Order directs

all federal agencies to address invasive species concerns as well as refrain from actions likely to increase invasive species problems.

Executive Order 13751

Signed on December 5, 2016, by President Obama, EO13751, Safeguarding the Nation from the Impacts of Invasive Species (2016) (81 FR 88609), amended EO13112 above. This new EO established the continuing need for coordinated Federal prevention and control efforts related to invasive species, including AIS. It perpetuated the National Invasive Species Council (NISC) and the Invasive Species Advisory Committee (ISAC) while expanding membership and redefining roles and responsibilities. EO13751 also incorporated human and environmental health considerations, climate change, technological innovation, and other emerging priorities into Federal efforts to address invasive species.

Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990

(NANPCA; Title I of Public Law No.101-646, 16 U.S.C. 4701 et seq.) This Act established a federal program to prevent the introduction of and control the spread of introduced aquatic nuisance species and the brown tree snake. The USFWS, the U.S. Coast Guard (USCG), the Environmental Protection Agency (EPA), the USACE, and the National Oceanic and Atmospheric Administration (NOAA) share responsibilities for implementing this effort. They act cooperatively as members of the ANSTF to develop programs for protection, monitoring, control, and research. The ANSTF conducts studies and reports to Congress. The Act also authorized the development of an AIS program housed within the USFWS and established the State/Interstate ANS Management Plan Grant Program, which is managed by the USFWS. Under NANPCA, state governors are authorized to submit comprehensive management plans to the ANSTF for approval that identify areas or activities for which technical and financial assistance is needed. The Montana Plan, after formal approval from the ANSTF, qualifies the state of Montana, through the AIS Bureau Chief, to seek such grants.

National Invasive Species Act of 1996

(NISA; Public Law No.104-332) In 1996, NISA amended NANPCA to mandate regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water and other vessel operations. This Act required a USCG study and report to Congress on the effectiveness of existing shoreside ballast water facilities used by crude oil tankers in the coastwise trade along Alaska as well as studies of Lake Champlain, the Chesapeake Bay, San Francisco Bay, Honolulu Harbor, the Columbia River system, other estuaries of national significance, and other waters. In addition, NISA amended NANPCA, specifying the need for a ballast water management program to demonstrate technologies and practices to prevent AIS from being introduced into and spread through ballast water in United States waters.

Aquatic Nuisance Species Task Force

Established in 1991 by NANPCA (as amended), the ANSTF, co-chaired by the USFWS and the NOAA, provides a national forum to coordinate efforts among federal and state agencies as well as efforts of the private sector and other interest groups. Made up of 13 Federal agency representatives and 15 ex-officio members, the ANSTF oversees the formation and activities of regional AIS panels and committees, and other responsibilities as outlined in NANPCA. These members work with six regional

panels and issue-specific committees to meet the AIS management challenges identified in the ANSTF Strategic Plan. Of the nine national ANS management plans currently approved by the ANSTF; the following are most relevant to Montana:

- New Zealand Mudsail, *Potamopyrgus antipodarum*, approved 2007. [Revision to be completed in 2025]
- Quagga-Zebra Mussel Action Plan for Western U.S. Waters, approved in 2010 and the Updated Recommendations for the Quagga and Zebra Action Plan for Western U.S. Waters (QZAP 2.0), released in 2020.
- Ruffe Management Plan, approved in 1996.
- Snakehead Management Plan, approved in 2014.

State Authorities, Programs and Roles

Montana's AIS laws reflect a shared responsibility between FWP, MDA, DNRC and MDT to address AIS. Roles and responsibilities are further defined through Memorandum of Understanding (MOU) between the agencies (Appendix E). The MOU designates FWP as the state lead agency for AIS issues, and takes primary responsibility in implementing AIS prevention, early detection, response, outreach and coordination. DNRC administers the AIS grant program and provides staff and support to the WMCC and the MISC by providing administrative assistance. MDA administers the noxious weed program, and MDT owns many of the properties where watercraft inspection stations are located. All agencies have clear responsibilities designed to protect Montana's aquatic resources from losses associated with AIS plants, animals, and microbes. The pertinent legislation and rules associated with providing the agencies with regulatory authority can be found in (Appendix F).

Montana Aquatic Invasive Species Law [MCA 80 –7 – 1001 through 1019] is the primary law that empowers management action for aquatic invasive species. This legislation aims to detect, control, and manage invasive species in Montana. The MCA notes cooperative agreements, departmental responsibilities, inspections stations, and prohibitions (Appendix F).

Jurisdictions and Roles

Montana Fish, Wildlife & Parks manages and coordinates AIS prevention, early detection, rapid response, control, and outreach efforts for the state of Montana including:

- Training, management, and coordination of watercraft inspection stations
- Training, management, and coordination of AIS early detection monitoring
- Management of the AIS early detection lab
- Coordination of state-wide AIS outreach and education efforts
- Coordination and planning for AIS rapid response

AIS surveys and sampling are also conducted at hatcheries and for fish transplants to minimize the risk of pathogens and AIS movement. All of these efforts include partner and FWP staff coordination to ensure state-wide consistency and effective operations.

In addition to the AIS statute, FWP more broadly regulates specific nonnative species through the Exotic Wildlife and Prohibited Species listing (Appendix B). The Exotic Prohibited Species list prohibits the possession, sale, purchase, exchange or transport of listed species, including viable embryos or gametes. The list includes vertebrate and invertebrate species that threaten Montana's wildlife and habitat. Notable AIS species on the Exotic Prohibited Species list include zebra and quagga mussels (*Dreissenid* sp.), New Zealand mudsnails (*P. antipodarum*), North American bullfrog (*L. catesbeiana*) and red ear slider turtle (*Trachemys scripta elegans*).

Montana Department of Agriculture within its Agricultural Sciences Division, provides services and assistance in pest management, including biological control, monitoring, and control of terrestrial weed management through a classification system, rodent and insect management, and pesticide applicator licensing and training. MDA also manages the noxious weed list which includes several aquatic and riparian plants. (Appendix C). MDA has the authority to stop the sale of products with listed noxious weeds or other products that may contain AIS [MCA 80.7.4]

Montana Department of Transportation works closely with FWP where watercraft inspection stations must be set up temporarily on a public roadway and often permits roadside watercraft inspection stations to be established at DOT weigh stations rest areas or other MDT properties. MDT supports sign design and installation that communicate invasive species requirements. Finally, MDT provides information on commercially transported watercraft and aquatic-based equipment to FWP which allows for follow-up inspections.

Montana Department of Natural Resources and Conservation administers the AIS Grant program which provides competitive grant awards to enhance AIS prevention, education, monitoring, and research. DNRC also oversees the 310 permitting program which regulates modifications in stream channels. 310 permits require AIS inspections of equipment to help prevent the spread of AIS through construction activities. DNRC also provides administrative support for the Montana Invasive Species Council and the WMCC.

Montana Invasive Species Council is a group of resource managers and representatives charged by the Governor with developing a science-based, comprehensive program to identify, prevent, eliminate, reduce, and mitigate the impacts of all-taxa of invasive species in Montana. MISC is administratively attached to DNRC. Specifically, MISC identifies, and addresses gaps and needs on invasive species issues. MISC facilitated the development of a Dreissenid Economic Impact Assessment (Nelson 2019), the State of Montana's Invasive Species Rapid Response Guidelines (Montana Invasive Species Council 2020), multiple scientific advisory panels to inform AIS issues, including the use of eDNA for dreissenid early detection. MISC also conducted an Invasive Species Law Review (Montana Invasive Species Council 2018) to help identify gaps and needs with invasive species statute and rule in Montana.

Western Montana Conservation Commission was created to facilitate communication and coordination on water quality and AIS issues in western Montana. The Commission is required by statute to provide education, and monitoring plans every five years and can make recommendations to the Governor on all taxa invasive species issues and needs. WMCC is administratively attached to DNRC.

There are multiple state agencies that provide supporting AIS roles and responsibilities including:

Montana Highway Patrol (MHP) has the authority to interdict any vehicle that fails to stop at a watercraft inspection station or any watercraft that violates AIS statute or rules. MHP is authorized to instruct vehicles to return to roadside inspection stations and has the authority to issue citations for AIS violations.

Department of Environmental Quality (DEQ), under its Montana Pollution Discharge Elimination System program, works to protect the aquatic resources of the state. DEQ regulates the process to control aquatic invasive species where the application of chemicals must follow legal processes for proper use. DEQ also requires AIS inspections as part of their recreational dredging permitting program.

County Noxious Weed Districts work with FWP and MDA to manage invasive aquatic plant issues at a county level. County Weed Districts have management authority of aquatic invasive plants through the County Noxious Weed Control Act [MCA 7-22] and management actions are guided by individual county weed management plans.

Tribal Programs

Montana encompasses the ancestral lands of twelve Tribal Nations including the Assiniboine, Blackfeet, Chippewa, Cree, Crow, Gros Ventres, Little Shell, Northern Cheyenne, Pend D'Oreille, Kootenai, Salish, and Sioux. These Tribal Nations conduct a variety of prevention, monitoring, research, and management actions regarding aquatic invasive species. Several Tribes have AIS specific laws, actively manage watercraft inspection stations and conduct early detection monitoring. State agencies work collaboratively with many Tribes throughout the state to address AIS on Tribal lands.

The Confederated Salish and Kootenai Tribe has management authority over the waters of the Flathead Reservation, including portions of Flathead Lake and the Flathead River. The Tribe's activities on invasive species management range from addressing long-term infestation of flowering rush (*Botumus umbellatus*), lake trout (*Salvelinus namaycush*) management, and conducting watercraft inspections and decontaminations.

The Blackfeet Nation has management authority over waters within the Blackfeet Indian Reservation, including multiple lakes and miles of river. The Tribes' activities include conducting watercraft inspections and decontaminations.

Little Shell Tribe of Chippewa Indians of Montana conducts watercraft inspections at Hell Creek and has an active role in the management this waterbody.

Regional Programs

There are many regional efforts that provide a forum for advancing and discussing AIS management needs in the West. FWP is an active participant in the regional organizations listed here.

Aquatic Nuisance Species Task Force - Regional Panels were formed under a provision in NISA. Montana falls within two of the regional panels and FWP provides the voting member for the state.

Western Regional Panel on Aquatic Nuisance Species The goal of the WRP is to protect western aquatic resources by preventing the introduction and spread of non-native nuisance species into western marine and freshwater systems through the coordinated management and research activities of state, tribal, federal, commercial, environmental, research entities and other regional panels. The scope of the WRP encompasses 19 states, and all provinces west of the 100th Meridian.

Mississippi River Basin Regional Panel on Aquatic Invasive Species The mission of the MRBP on AIS is to assist in the development and implementation of strategic, action-oriented programs to prevent new introductions and manage the spread of aquatic invasive species in the Mississippi River watershed through coordinated communications, education, outreach, and research between basin stakeholders, agency partners, regional panels, and the ANSTF. The scope of the MRBP is 28 states.

The 100th Meridian Initiative is a cooperative effort between local, state, provincial, regional, tribal, and federal agencies to prevent the westward spread of zebra/quagga mussels and other aquatic nuisance species in North America. Montana falls within two of the 100th Meridian basin teams that work collaboratively to address regional AIS issues.

Columbia River Basin AIS Team (CRB) This team serves as forum on Columbia River Basin AIS issues and includes representation from Pacific States Marine Fisheries Commission, Portland State University, Tribal agencies, and state and federal entities in Oregon, Washington, Idaho, and Montana. The purpose of the group is to enhance regional AIS coordination in the Columbia River Basin.

Missouri River Basin AIS Team (MRB) This team is comprised of 100th Meridian Initiative partners primarily in Montana, North Dakota, South Dakota, Wyoming, Nebraska, Iowa, Colorado, Kansas, and Missouri and serves as a forum on Missouri River Basin AIS issues.

Other organizations that Montana state agencies work with to further the success of aquatic invasive species management within the state include: the Greater Yellowstone Coordinating Committee - Aquatic Invasive Species group, the Invasive Species Action Network (ISAN), the Missouri River Watershed Coalition, Trout Unlimited, the North American Invasive Species Management Association (NAISMA), the Pacific Northwest Economic Region (PNWER) invasive species work group and the Western Governors' Association.

Program Objectives

This document establishes objectives and strategies that will help guide the future development of the AIS program. The Plan seeks to achieve the following objectives:

Objective A. Maintain and Expand Coordination – Engage in active efforts by multiple partners to ensure that Montana aquatic invasive species management is responsive, collaborative and effective.

Objective B. Prevention the Introduction – Engage in active efforts to protect Montana ecosystems and economies from aquatic invasive species introduction

Objective C. Early Detection – Engage in active efforts to detect aquatic invasive species early using innovative and efficient methods.

Objective D. Response and Preparedness – Engage in active efforts to prepare and act knowledgeably to prevent the establishment of aquatic invasive species.

Objective E. Treatment and Control – Engage in active efforts to prepare for swift and compliant response to new and ongoing efforts to minimize aquatic invasive species populations.

Objective F. Outreach, Education and Behavior Change - Instructing the public on the impacts of aquatic invasive species and empowering them to change their behaviors to help prevent their spread.

Objective G. Evaluation of Laws and Rules – Regular and systematic review of laws and rules to refine agency efficiencies and sufficiently address aquatic invasive species management needs.

Strategies to Address Program Objectives

The following strategies have been identified to address the objectives of the plan and to provide a framework for the actions to be implemented. The strategies are intended to be addressed within a 5-year implementation timeline and are considered dynamic and achievable. Each objective and strategy will be outlined in the implementation table with information on the responsible entity, actions, funding, and level of priority. Strategies contain an evaluation component to effectively gage progress.

Objective A: Maintain and Expand Coordination

Managing invasive species is complex and requires support and cooperation among partners working together at the local, regional, and national level. Regional partnerships between state, provincial and federal agencies have built strong regional coordination and have developed standard protocols for AIS inspection and early detection monitoring. Montana if fortunate to have many partners working together to address AIS issues. Close coordination and communication among these partners promote an all-hands-on-deck approach and maximizes our chance of success addressing AIS issues.

Strategy A.1: Maintain an engaged and effective AIS program for the state of Montana.

A.1.1 Continue to staff, fund and support AIS efforts to protect Montana’s water resources from the impacts of AIS.

Strategy A.2: Implement Montana’s AIS Plan.

A.2.1 Review Plan progress and action items annually.

Strategy A.3: Continue direct coordination, communication and engagement between state, federal, Tribal, and local agencies, non-governmental organization and interested public on AIS issues.

- A.3.1** Regularly engage with partners to identify program needs, gaps, and additional coordination opportunities. Provide regular program updates and participate in regional AIS meetings. Host AIS focused meetings to provide information, receive feedback and discuss program development.
- A.3.2** Clearly establish and communicate state agency roles and responsibilities for AIS coordination and program implementation.

Strategy A.4: Increase capacity for state, federal, Tribal, and local agencies to support AIS efforts.

- A.4.1** Continue to engage with partners to identify new coordination opportunities and resources.
- A.4.2** Work collaboratively to respond adaptively to climate change-invasive species challenges to improve management outcomes.

Strategy A.5: Submit annual program progress reports to the legislature, funding entities and partners.

- A.5.1** Submit AIS program reports annually.

Strategy A.6: Coordinate AIS efforts at the state, regional, national, and international level to ensure continuity and consistency to maximize efficiency and efficacy and to prevent the movement of AIS into Montana.

- A.6.1** Participate in leadership roles with regional and national groups engaged in AIS issues including the CRB, the MRB, the WRP, the MRBP, NAISMA, and the PNWER and WGA Invasive Species Workgroups.
- A.6.2** Continue to engage nationally and internationally to advocate for improved containment at mussel impacted waters.
- A.6.3** Coordinate with mussel impacted states and provinces to identify strategies to address high risk vectors transporting AIS into and through Montana including internet boats sales in the Midwest and commercial boat transports.
- A.6.4** Promote sustained federal funding to support AIS efforts in Montana and regional prevention and containment efforts.
- A.6.5** Coordinate with regional partners to evaluate and improve watercraft inspection and monitoring protocols.
- A.6.6** Coordinate with regional partners to evaluate and improve AIS outreach and education efforts and improve efficacy evaluation for influencing behavior change.
- A.6.7** Coordinate with regional partners to identify and address research gaps to improve prevention and early detection methods and protocols.
- A.6.8** Continue to coordinate with regional partners to promote a regional defense strategy. Investigate and establish permanent inspection stations at strategic locations to prevent mussel introduction.

Strategy A.7: Establish evaluation criteria for AIS prevention, early detection and outreach.

- A.7.1** Evaluate program progress annually. Coordinate with partners to communicate progress and to identify needs / strategies for continual program improvement.

Objective B: Prevent the Introduction

Preventing the introduction of AIS is the most effective and efficient way to address the threat of aquatic invasive species. Controlling AIS once they are established is difficult and often impossible. Therefore, investing time and resources into prevention efforts is critical for the protection of water-based infrastructure, recreation, and the environment. Addressing pathways rather than specific species is the most effective method for preventing AIS introduction.

Strategy B.1: Prevent the introduction and movement of AIS on watercraft.

- B.1.1** Continue operation of watercraft inspection stations on high-risk corridors.
- B.1.2** Evaluate inspection data to improve data collection and data analysis to determine better ways address risk of AIS transport.
- B.1.3** Evaluate and update the WID app to improve data collection. Including evaluation of using bar-code readers, receipt features, radio frequency identification (RFID) technology, check-in/check-out, and other potential strategies to improve data collection and risk evaluation.
- B.1.4** Identify partners to assist with management of watercraft inspection stations at high-risk locations currently managed by FWP staff.
- B.1.5** Evaluate and implement protocols to continually improve quality control for watercraft inspections. Multiple strategies may be explored to improve:
 - Watercraft inspection staff recruitment and retention.
 - Training and reinforce protocols.
 - Hands-on training for ballast boat decontamination.
 - Station oversight and reinforce Quality Assurance/Quality Control protocols.
- B.1.6** Evaluate watercraft inspection protocols to ensure AIS risk is addressed in the most efficient and effective manner possible.
- B.1.7** Explore opportunities to establish permanent inspection facilities at the highest priority locations (Wibaux, Hardin, Dillon) to support a regional defense strategy.
- B.1.8** Explore the use of technology to improve station oversight and compliance.
- B.1.9** Explore night operation of inspection station at locations that see the highest risk boat traffic.
- B.1.10** Identify strategies to improve compliance at inspection stations with improved signage, increased enforcement, and outreach. Engage and educate enforcement entities state-wide to increase their involvement with AIS enforcement. Explore funding from federal sources to support focused county AIS enforcement.
- B.1.11** Evaluate new technology that can improve inspection and decontamination efficiency and efficacy (e.g. on-demand hot water units, improved signage).
- B.1.12** Coordinate with and train private entities to provide inspections to address gaps (e.g. ballast boat mechanics, boat rental businesses, spill response firms)
- B.1.13** Explore technological tools to help ensure compliance with mandatory inspection requirements.

Strategy B.2: Prevent the introduction and movement of AIS on water-based equipment and other sources.

- B.2.1** Regularly review 310 permit language to ensure AIS risk is addressed.
- B.2.2** Provide targeted outreach to address potential AIS transported on used irrigation equipment.
- B.2.3** Continue to coordinate with MDT and contractors to ensure construction equipment (e.g. barges, dredges) is inspected prior to use in Montana waters.
- B.2.4** Continue to work with DEQ to ensure out of state mining equipment is inspected and follows dredging permit requirements.
- B.2.5** Continue to work with seaplane pilots on regional efforts to assess and address the risk of AIS transport on seaplanes.
- B.2.6** Work with counties to ensure used docks and boat lifts receive inspections prior to installation.
- B.2.7** Work with marinas to ensure inspection before launch requirements are met on watercraft.
- B.2.8** Continue to work with manufacturers, retailers, anglers, outfitters, and guides to promote cleaning of waders, boats, and gear to prevent the movement of AIS. Improve coordination with guides and outfitters to promote educating their clients on AIS issues and gear decontamination. Explore establishing wading gear cleaning stations at strategic locations.
- B.2.9** Expand the Don't Let it Loose effort to prevent AIS releases from aquariums and ornamental ponds.
- B.2.10** Continue to work with MDA and nurseries to ensure aquatic nursery stock are permitted and free of AIS contaminants.
- B.2.11** Develop and implement site-specific AIS risk assessments for fish hatcheries and holding facilities.
- B.2.12** Implement and refine standard AIS survey protocols based on risk assessment evaluation for in state and out of state fish hatcheries. Develop these protocols in coordination with the regional effort to standardize hatchery AIS survey and reporting requirements.
- B.2.13** Periodically review and update hatchery HACCP plans.
- B.2.14** In coordination with DNRC, continue to refine and integrate AIS prevention protocols for fire suppression operations.
- B.2.15** In coordination with DNRC, identify a strategy to address AIS transport on water trucks who transport surface water for construction, drilling and other commercial operations.

Objective C: Early Detection

If prevention efforts fail, it is critical to detect new introductions of AIS as soon as possible. Doing so will minimize the chance of spread and maximize the chance for successful eradication. Early detection methods will vary depending on the species.

Strategy C.1: Continue a comprehensive AIS early detection and monitoring program.

- C.1.1** Continue high level of multi taxa AIS early detection sampling and surveys state-wide.
- C.1.2** Annual evaluation of the AIS sampling plan and prioritization of waters for early detection sampling based on new detections in the state and region.
- C.1.3** Annual evaluation of emerging AIS threats to identify new species to target for survey and sampling.
- C.1.4** Annual evaluation of sampling methods and protocols to ensure protocols maximize the likelihood of AIS early detection.
- C.1.5** Coordinate and expand efforts of interested parties to expand comprehensive statewide sampling and early detection efforts including meetings with partners to coordinate early detection survey and sampling efforts for the next season, training volunteer-monitoring networks and other interested parties. Promote the use of FWP AIS early detection protocols and the use of the FWP AIS monitoring app.
- C.1.6** Evaluate equipment decontamination protocols to ensure effectiveness and efficiency.
- C.1.7** Expand the use of eDNA as AIS early detection surveillance tool in the state. Coordinate with researchers to develop and define eDNA into an operational AIS early detection tool.
- C.1.8** Maintain and utilize the FWP AIS Dive Team to serve as a resource to conduct targeted AIS survey and removal.
- C.1.9** Continue operation of the FWP AIS Lab to process samples for mussel veligers and provide diagnostic services for aquatic plants and animals. Explore other early detection and diagnostic services the lab can provide.
- C.1.10** In cooperation with the Montana Heritage Program, collect, review, and maintain AIS sampling databases in a manner to be used effectively by state, federal, and other interested parties.
- C.1.11** Support and integrate new technologies or methods as they develop and mature.

Objective D: Rapid Response and Preparedness

Responding quickly to the detection of a new AIS introduction is critical for containing spread or facilitating eradication. Response planning and the incident command system (ICS) are key tools for response preparedness.

Strategy D.1: Maintain response preparedness.

- D.1.1** Annually evaluate the Dreissenid Rapid Response Guidelines and update if needed.
- D.1.2** Develop response guidelines for other high risk AIS species.
- D.1.3** Annually provide staff with ICS training and hold refresher training to ensure a base level of response preparedness.
- D.1.4** Conduct annual ICS-based exercises with FWP and partners to maintain preparedness for an efficient response to a new AIS detection. Explore training exercises for response to dreissenids and other high priority AIS species.

Objective E: Control and Eradicate

In the event of an AIS introduction, viable treatment options for containment or eradication are an important component for mitigating AIS impacts.

Strategy E.1: Prepare treatment strategies for new AIS detections.

- E.1.1** Compile response strategies for treatment of new AIS detections.
- E.1.2** Identify funding sources for rapid response treatment actions.
- E.1.3** Identify and preemptively address rapid response treatment regulatory requirements.
- E.1.4** Proactively develop Environmental Assessments (EA) for treatment of high-risk species, if required.
- E.1.5** Continue ongoing training and preparation of the AIS dive team for rapid response survey and treatment.
- E.1.6** Identify contractors who could conduct AIS treatments or provide and install silt curtains.

Strategy E.2: Control or eradicate existing AIS population where reasonable.

- E.2.1** Conduct eradication projects on existing high-priority AIS populations within the state.
- E.2.2** Provide sampling or control support and expertise to partners who are engaged in AIS treatment projects.

Objective F: Outreach, Education and Behavior Change

It is imperative that boaters and other key audiences are aware of AIS issues and what they can do to help prevent the introduction and spread of AIS. Changing habits, attitudes and behaviors can be difficult to address, but diverse strategies can address these needs.

Strategy F.1: Provide outreach and awareness about AIS through diverse efforts.

- F.1.1** Hold an annual AIS meeting to update partners on AIS outreach efforts and program achievements and coordinate new initiatives and projects.
- F.1.2** Develop and maintain an AIS outreach plan that will target information to boaters, anglers, other water users, the public, agencies, and private industry. The plan will include the development of targeted outreach strategies for ballast boat owners, wading anglers, waterfowl hunters, aquarium pet owners, and ornamental pond owners.
- F.1.3** Evaluate the AIS outreach plan annually and update as needed.
- F.1.4** Provide training for FWP personnel and other interested parties to prevent the spread of AIS during field work or other activities.
- F.1.5** Provide easy public access with up-to-date AIS distribution information in the state.
- F.1.6** Facilitate the dissemination of information, research, and data on AIS.
- F.1.7** Expand and identify new approaches for web-based information on AIS in Montana.
- F.1.8** Explore expanding the use of Geofencing to better target AIS messages to specific areas.
- F.1.9** Continue to engage and involve partners to deliver accurate and consistent AIS information at the local level.
- F.1.10** Create targeted community based social marketing messages to reinforce the Protect Our Waters, Clean, Drain, Dry and Don't Let it Loose campaigns.
- F.1.11** Explore outreach methods that are most effective to reach specific audiences including print, radio, tv, social media, video segments and other targeted media approaches.
- F.1.12** Provide "train the trainer" instruction to natural resource professionals, educators, conservation districts, and others to expand the reach of AIS outreach and awareness state-wide.
- F.1.13** Expand social media presence with short training videos, novel messaging, and educational memes.
- F.1.14** Continue industry outreach efforts state-wide with water-based private businesses.

Objective G: Evaluation of Laws and Rules

Montana's existing AIS statutes and rules were enacted over multiple years. This has helped to build a strong and effective program to address the AIS issue, however gaps and needs remain.

The MISC conducted an invasive species law review in 2018 which identified several gaps and needs related to AIS. These issues were discussed at the AIS Summit and these changes were supported by summit participants.

Strategy G.1: Regularly review laws to determine gaps and needs that could be changed to improve the efficacy and efficiency of the AIS program.

- G.1.1** Review feasibility of legislative action to define roles and responsibilities more clearly between state agencies responsible for AIS through Title 80 to ensure effective and efficient program coordination and implementation. Currently AIS responsibilities in statute are shared between FWP, MDA, MDT and DNRC with roles and responsibilities defined in MOU.
- G.1.2** Review feasibility of creating an AIS species list that would provide a single list of aquatic invasive plants and animals that provides clear management authority.
- G.1.2.1** Identify additional species to be added to the prohibited species list.
- G.1.3** Review the feasibility and need for a pull the plug requirement for watercraft.
- G.1.4** Review the feasibility and need for increased penalties for watercraft that fail to stop at inspection stations.
- G.1.5** Evaluate the effectiveness and utility of the AIS Trust Fund.
- G.1.6** Review and clarify overlapping AIS responsibilities shared by the WMCC and the state-wide AIS program managed by FWP.
- G.1.7** Evaluate statutory requirements for integrating technology-based requirements to help ensure boaters meet inspection before launch requirements.

Priorities for Action

A suite of more than 16 strategies and 90 corresponding actions have been identified to fully implement the Plan. All strategies are summarized in the implementation table. All the strategies within the Plan are important, however a selection of the highest priority strategies here has been identified where action is required in the short term to assure effective and consistent AIS program operations in Montana.

Strategy A.1: Maintain an engaged and effective AIS program for the state of Montana.

A.1.1 Continue to staff, fund and support AIS efforts to protect Montana's water resources from the impacts of AIS.

The AIS program in Montana has made incredible progress in recent years following the detection of invasive mussels in the state. The Montana Legislature has provided funding and staff to support an effective program that actively leads prevention, early detection, and outreach efforts. Maintaining support, funding and staff helps to ensure a continued effective effort to protect Montana from the threats of AIS.

Strategy A.3: Increase coordination, communication and engagement between state, federal, Tribal, and local agencies, non-governmental organization and interested public on AIS issues.

A.3.1 Regularly engage with partners to identify program needs, gaps and additional coordination opportunities. Provide regular program updates, participate in regional AIS meetings, host AIS focused meetings to provide information, receive feedback and discuss program development.

A large part of the success of the AIS program in Montana is due to active partner engagement and involvement in the AIS issue. Local involvement by conservation districts, counties, Tribes, and non-profit organizations has been critical for improving inspection station management, expanding on the ground early detection survey and delivering AIS outreach to local communities and user groups.

Strategy A.6: Coordinate AIS efforts regionally, nationally, and internationally to ensure continuity and consistency, to maximize efficiency and efficacy and to prevent the movement of AIS into Montana with FWP as the lead agency.

Montana has a robust AIS program that addresses AIS issues within the state. But many states face authority and funding challenges that limit how much can be done to address the AIS issue. Watercraft coming from these states represent a significant threat of AIS transport into Montana. Close regional coordination is important to encourage and enable state programs to become more active in watercraft inspection, early detection, and containment of existing AIS infestations. Close coordination also encourages consistent protocols that utilize the best science to effectively address the AIS issue.

AIS movement on recently purchased boats continues to be a priority. The majority of mussel fouled vessels intercepted in Montana are typically recently purchased from the Midwest. FWP and other western states are coordinating with the Great Lakes Panel of the ANSTF to identify strategies to help ensure these boats are clean before they travel west.

Strategy B.1: Prevent the movement of AIS on watercraft.

- B.1.5** Evaluate and implement protocols to continually improve quality control for watercraft inspections.

Continue to evaluate ways to improve quality control at watercraft inspection stations to ensure watercraft are clean, drained, and dry with every inspection.

- B.1.10** Identify strategies to improve compliance at inspection stations with improved signage, increased enforcement, and outreach.

Continue to explore strategies to increase enforcement involvement to help ensure compliance at watercraft inspection stations and other compliance with other AIS regulations.

- B.1.13** Explore technological tools to help ensure compliance with mandatory inspection requirements.

Identify strategies using technology to ensure boaters comply with watercraft inspection requirements.

Strategy C.1: Continue a comprehensive AIS early detection and monitoring program.

- C.1.5** Coordinate and expand efforts of interested parties to expand comprehensive statewide sampling and early detection efforts including meetings with partners to coordinate early detection survey and sampling efforts for the next season, training volunteer-monitoring networks and other interested parties.

The more people that are looking for AIS, the more likely it is that populations will be detected early. FWP seeks to increase awareness of AIS with partners and the public and encourage involvement in early detection surveys. FWP is exploring various ways to train individuals in AIS early detection monitoring and reporting to help expand the AIS early detection effort state-wide.

Strategy F.1: Provide outreach and awareness about AIS through diverse efforts.

- F.1.10** Create targeted community based social marketing messages to reinforce the Protect Our Waters, Clean, Drain, Dry and Don't Let it Loose campaigns.

Community based social marketing is targeted at encouraging specific behaviors and minimizing perceived barriers to achieve a desired action. For example, finding strategies that encourage adoption of Clean, Drain, Dry as a regular habit for all boaters is an important need.

Program Monitoring and Evaluation

The Montana AIS Management Plan will be reviewed annually to determine progress on addressing Plan objectives and strategies. Plan evaluation will include soliciting feedback from partners through regional AIS meetings to discuss program progress, prioritization and to identify gaps and needs for addressing Plan objectives and strategies.

Plan evaluation will include:

- Evaluation of status of each objective and determination if they have been achieved.
- Incorporation of new data to update AIS distribution maps.
- Incorporation of new information to better address the Plan's objectives and strategies.

Progress updates that address the Plan objectives and strategies will be incorporated into an annual FWP prevention and early detection AIS report. This report includes detailed data on watercraft inspections and decontaminations, monitoring effort, and monitoring results. A discussion on the current management compared to previous years is explored for progress, improvement or shortfalls. In addition, containment or control projects are also included in this report. Detailed methods and results of containment and control projects can be measured against the project goal or previous efforts. Annual reports are disseminated at public meetings, by direct email to hundreds of partners across the state and posted on the FWP AIS Program webpage. An annual meeting post field season is the primary means to share program results and obtain feedback to make changes or improvements for the following year.



Gaps and Challenges

As dreissenid mussel populations continue to expand and move closer to Montana borders, the pressure to protect Montana waters becomes even greater. Dreissenid mussels continue to advance in the Missouri River Basin to new waters with the most recent detection in Lake Oahe, SD. In 2023, the first detection of dreissenids in the Snake River, Idaho brought mussels into the Columbia River Basin. With these detections, the work to prevent spread and conduct monitoring becomes even more significant. By working with regional AIS managers and finding ways to strengthen measures to detect, contain and prevent further spread we can ensure that Montana waters are protected.

Golden mussels (*Limnoperna fortune*) are a new invasive mussel species that were first detected in North America in September of 2024. This species has similar impacts to dreissenid mussels and is anticipated to spread quickly and cause significant impacts. Montana's AIS Plan needs to be adaptable and innovative to address new AIS threats like golden mussels and other new AIS that threaten Montana's waters.

A continual challenge is the ongoing effort to refine and describe the roles and responsibilities of the multiple state, federal and tribal agencies involved in AIS management efforts. To address this challenge periodic review of rules and regulations and deliberate communication efforts are needed. An additional legal challenge is compliance by all watercraft operators to practice Clean Drain Dry and stop at watercraft inspection stations. State and local enforcement have provided much needed help to address compliance, but meeting this need can be difficult. There can be a lack of enforcement available for this targeted work due to budget or staff shortages. Further once citations are presented, the penalties served may be inconsistent or minor. Deliberate education on AIS for judicial system representatives could be one way to address this challenge.

As humanity faces new changes to our climate, our capacity to successfully manage and address impacts to Montana's water, and aquatic species will require an adaptive perspective. Without full knowledge of the potential issues that may present themselves or potential impacts, management actions will have to be responsive and innovative to address new challenges. Despite this uncertainty, the fact that invasive species and climate change can respond synergistically to impact native species and habitats is well recognized. Therefore, this provides an opportunity to consider the value of addressing invasive species to mitigate climate impacts. Understanding how changes in climate may affect management capacity, species survival, adaptation of previously non-suitable species will be critical.

AIS managers are continually facing new challenges whether responding to new detected species, hiring difficulties, or having adequate response tools. Ensuring that the Montana AIS program has consistent funding to provide adaptive management will continue as a need. The Montana State Legislature has been supportive of AIS needs and has many champions to convey the threat that AIS will continue to pose. However, changes in leadership and budget cuts can all influence the budget for a strong AIS program implementation.

Implementation Tables

The following tables provide the fiscal estimates to implement the identified objectives of the Montana AIS Management Plan. It is expected that implementable actions will be dynamic and will change due to changes in authority, priorities, resources, and expertise. Each column of the table identifies the implementing entity, the action, details about the action, whether the action is ongoing or is proposed, and the period for implementing the action.

The ongoing actions in the table will be implemented unless replaced by higher priority actions. Proposed actions will be implemented when funds or staff resources are made available for those new actions. By identifying proposed actions, it will help determine future needs and support participants' requests for funds to implement them.

The magnitude of cost is provided as a range as follows:

- \$ <\$50,000
- \$\$ 50,000-\$200,000
- \$\$\$ \$200,000- \$750,000
- \$\$\$\$>\$750,000

Objective A: Maintain and Expand AIS Coordination

Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy A.1: Maintain an engaged and effective AIS program for the state of Montana.						
A.1.1 Action: Continue to staff, fund and support AIS efforts to protect Montana's water resources from the impacts of AIS.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$\$\$\$
Strategy A.2: Implement Montana's AIS Plan.						
A.2.1 Action: Review Plan progress and action items annually.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$\$\$\$
Strategy A.3: Continue direct coordination, communication and engagement between state, federal, tribal, and local agencies, non-governmental organization and interested public on AIS issues.						
A.3.1 Action: Regularly engage with partners to identify program needs, gaps, and additional coordination opportunities. Provide regular program updates and participate in regional AIS meetings. Host AIS focused meetings to provide information, receive feedback and discuss program development.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$

Objective A: Maintain and Expand AIS Coordination						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
A3.2 Action: Clearly establish and communicate state agency roles and responsibilities for AIS coordination and program implementation.	FWP	DNRC, MDA, MDT	N/A	Existing	Ongoing	\$
Strategy A4: Increase capacity for state, federal, Tribal, and local agencies to support AIS efforts.						
A4.1 Action: Continue to engage with partners to identify new coordination opportunities and resources.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$
A4.2 Action: Work collaboratively to respond adaptively to climate change-invasive species challenges to improve management outcomes.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants	Existing	Ongoing	\$
Strategy A5: Submit annual program progress reports to the legislature, funding entities and partners.						
A5.1 Action: Submit AIS program reports annually.	FWP	DNRC, MISC, WMCC	N/A	Existing	Ongoing	\$

Objective A: Maintain and Expand AIS Coordination						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy A.6: Coordinate AIS efforts at the state, regional, national, and international level to ensure continuity and consistency to maximize efficiency and efficacy and to prevent the movement of AIS into Montana.						
A.6.1 Action: Participate in leadership roles with regional and national AIS groups including the CRB, the MRB, the WRP, the NAISMA, the PNWER Invasive Species Workgroup.	FWP	Regional States and Provinces, Federal Agencies and Tribes	State funds and federal grants.	Existing	Ongoing	\$
A.6.2 Action: Continue to engage nationally and internationally to advocate for improved containment at mussel impacted waters.	FWP	Regional States and Provinces, Federal Agencies and Tribes	State funds and federal grants.	Existing	Ongoing	\$
A.6.3 Action: Coordinate with mussel impacted states and provinces to identify strategies to address high risk vectors transporting AIS into and through Montana, including internet boats sales in the Midwest, commercial boat transports.	FWP	Regional States and Provinces, Federal Agencies and Tribes, WRP, WISCE	State funds and federal grants.	Existing	Ongoing	\$
A.6.4 Action: Promote sustained federal funding to support AIS efforts in Montana and regional prevention and containment efforts.	FWP	Regional States and Provinces, Federal Agencies and Tribes, WRP	State funds and federal grants.	Existing	Ongoing	\$

Objective A: Maintain and Expand AIS Coordination						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
A.6.5 Action: Coordinate with regional partners to evaluate and improve watercraft inspection and monitoring protocols.	FWP	Regional States and Provinces, Federal Agencies and Tribes, WRP, WISCE	State funds and federal grants.	Existing	Ongoing	\$
A.6.6 Action: Coordinate with regional partners to evaluate and improve AIS outreach and education efforts, improve efficacy evaluation for influencing behavior change.	FWP	Regional States and Provinces, Federal Agencies and Tribes, NGOs, WRP	State funds and federal grants.	Existing	Ongoing	\$
A.6.7 Action: Coordinate with regional partners to identify and address research gaps to improve prevention and early detection methods and protocols.	FWP	Regional States and Provinces, Federal Agencies and Tribes, WRP	State funds and federal grants.	Existing	Ongoing	\$
A.6.8 Action: Continue to coordinate with regional partners to promote the regional defense strategy. Investigate and establish permanent inspection stations at strategic locations to prevent mussel introduction.	FWP	Regional States and Provinces, Federal Agencies and Tribes, WRP, WISCE	State funds and federal grants.	Existing	Ongoing	\$
Objective A: Maintain and Expand AIS Coordination						

Montana Aquatic Invasive Species Management Plan

Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy A.7: Establish evaluation criteria for AIS prevention, early detection and outreach.						
A.7.1: Evaluate program progress annually. Coordinate with partners to communicate progress and to identify needs / strategies for continual program improvement.	FWP	State Agencies, Federal Agencies, Tribes, Counties, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.1: Prevent the movement of AIS on watercraft.						
B.1.1 Action: Continue operation of watercraft inspection stations on high-risk corridors.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$\$\$\$
B.1.2 Action: Evaluate inspection data to improve data collection and data analysis to determine better ways address risk of AIS transport.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts	State funds and federal grants.	Existing	Ongoing	\$
B.1.3 Action: Evaluate and update the WID app to improve data collection. Including evaluation of bar-code readers, receipt features, RFID technology, check-in/check-out and other potential strategies to improve data collection and risk evaluation.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts	State funds and federal grants.	Existing	Ongoing	\$
B.1.4 Action: Identify partners to assist with management watercraft inspection stations at high-risk locations currently managed by FWP staff.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist..	State funds and federal grants.	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.1. Cont.						
B.1.5 Action: Evaluate and Implement protocols to continually improve quality control for watercraft inspections. Multiple strategies may be explored: to improve watercraft inspection staff recruitment and retention; to improve training and reinforce protocols; to improve hands-on training for ballast boat decontamination; to improve station oversight and reinforce QA/QC protocols.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$
B.1.6 Action: Evaluate watercraft inspection protocols to ensure AIS risk is addressed in the most efficient and effective manner possible.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts	N/A	Existing	Ongoing	\$
B.1.7 Action: Explore opportunities to establish permanent inspection facilities at the highest priority locations (Wibaux, Hardin, Dillon) to support a regional defense strategy.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$\$
B.1.8 Action: Explore the use of technology to improve station oversight and compliance.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.1. Cont. B.1.9 Action: Explore night operation of inspection station at locations that see the highest risk boat traffic.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
B.1.10 Action: Identify strategies to improve compliance at inspection stations with improved signage, increased enforcement, and outreach. Engage and educate enforcement entities state-wide to increase their involvement with AIS enforcement. Explore funding from federal sources to support focused county AIS enforcement.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
B.1.11 Action: Evaluate new technology that can improve inspection and decontamination efficiency and efficacy (e.g. on demand hot water units, improved signage).	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
B.1.12 Action: Coordinate with and train private entities to provide inspections to address gaps (e.g. ballast boat mechanics, boat rental businesses).	FWP	Private Businesses	State funds and federal grants.	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.1. Cont. B.1.13 Action: Explore technological tools to help ensure compliance with mandatory inspection requirements.	FWP	Private Businesses	State funds and federal grants.	Existing	Ongoing	\$
Strategy B.2: Prevent the movement of AIS on water-based equipment and other sources.						
B.2.1 Action: Regularly review 310 permit language to ensure AIS risk is addressed.	FWP	DNRC Conservation Districts	N/A	Existing	Ongoing	\$
B.2.2 Action: Provide targeted outreach to address potential AIS transported on used irrigation equipment.	FWP	DNRC, MDA, Conservation Districts	State funds and federal grants.	Existing	Ongoing	\$
B.2.3 Action: Continue to coordinate with MDT and contractors to ensure construction equipment (e.g. barges, dredges) are inspected prior to use in Montana waters.	FWP	MDT	State funds and federal grants.	Existing	Ongoing	\$
B.2.4 Actions: Continue to work with DEQ to ensure out of state mining equipment is inspected and follows dredging permit requirements.	FWP	DEQ	State funds and federal grants.	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species

Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.2. Cont.						
B.2.5 Action: Continue to work with seaplane pilots on regional efforts to assess and address the risk of AIS transport on seaplanes.	FWP	NGOs	State funds and federal grants	Existing	Ongoing	\$
B.2.6. Action: Work with counties to ensure used docks and boat lifts receive inspections prior to installation.	FWP	Counties	State funds and federal grants	Existing	Ongoing	\$
B.2.7. Action: Work with marinas to ensure inspection before launch requirements are met on watercraft.	FWP	WMCC, CEMIST, Marina owners	State funds and federal grants	Existing	Ongoing	\$
B.2.8 Actions: Continue to work with manufacturers, retailers, anglers, outfitters, and guides to promote cleaning of waders, boats, and gear to prevent the movement of AIS. Improve coordination with guides and outfitters to promote educating their clients on AIS issues and gear decontamination. Explore establishing wading gear decontamination stations at strategic locations.	FWP	State & federal agencies, tribes, counties, Cons. Distr., NGOs, WMCC	State funds and federal grants	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species

Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.2. Cont. B.2.9 Action: Expand the Don't Let it Loose message to prevent AIS releases from aquariums and ornamental ponds.	FWP	State & federal agencies, tribes, counties, Cons. Distr., NGOs, WMCC	State funds and federal grants	Existing	Ongoing	\$
B.2.10 Action: Continue to work with MDA and nurseries to ensure aquatic nursery stock are permitted and free of ASI-contaminants.	FWP	MDA	State funds and federal grants	Existing	Ongoing	\$
B.2.11 Actions: Develop and implement site-specific AIS risk assessment for fish hatcheries and holding facilities.	FWP	USFWS, Private Hatcheries	State funds and federal grants	Existing	Ongoing	\$
B.2.12 Actions: Implement and refine standard AIS survey protocols based on risk assessment evaluation for in state and out of state fish hatcheries. Develop these protocols in coordination with the regional effort to standardize hatchery AIS survey and reporting requirements.	FWP	WRP, WISCE, USFWS, Private Hatcheries	State funds and federal grants	Existing	Ongoing	\$

Objective B: Prevent the Introduction of Aquatic Invasive Species

Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy B.2. Cont. B.2.13 Action: Periodically review and update hatchery HACCP plans.	FWP	FWP, USFWS	State funds and federal grants.	Existing	Ongoing	\$
B.2.14 Action: In coordination with DNRC, continue to refine and integrate AIS prevention protocols for fire suppression operations.	FWP	DNRC, BLM	State funds and federal grants.	Existing	Ongoing	\$
B.2.15 Action: In coordination with DNRC, identify a strategy to address AIS transport on water trucks who transport surface water for construction, drilling and other commercial operations.	FWP	MDT	State funds and federal grants.	Existing	Ongoing	\$

Objective C: Early Detection						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy C.1: Continue a comprehensive AIS early detection and monitoring program.						
C.1.1 Action: Continue high level of multi taxa AIS early detection sampling and surveys state-wide.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., NGOs	State funds and federal grants.	Existing	Ongoing	\$\$\$
C.1.2 Action: Annual evaluation of the AIS sampling plan and prioritization of waters for early detection sampling based on new detections in the state and region.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., NGOs, MWCC	State funds and federal grants.	Existing	Ongoing	\$
C.1.3 Action: Annual evaluation of emerging AIS threats to identify new species to target for survey and sampling.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., NGOs	State funds and federal grants.	Existing	Ongoing	\$
C.1.4 Action: Annual evaluation of sampling methods and protocols to ensure protocols maximize the likelihood of AIS early detection.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist..	State funds and federal grants.	Existing	Ongoing	\$

Objective C: Early Detection						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
C.1.5 Action: Coordinate and expand efforts of interested parties to expand comprehensive statewide sampling and early detection efforts including meetings with partners to coordinate early detection survey and sampling efforts for the next season, training volunteer-monitoring networks and other interested parties and promote use of the FWP AIS monitoring app.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., NGOs, MWCC	State funds and federal grants.	Existing	Ongoing	\$
C.1.6 Action: Evaluate equipment decontamination protocols to ensure effectiveness and efficiency.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	N/A	Existing	Ongoing	\$
C.1.7 Action: Expand the use of eDNA for AIS early detection surveillance tool in the state. Coordinate with researchers to develop and define eDNA into an AIS early detection tool.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., Universities, WRP	State funds and federal grants.	Existing	Ongoing	\$\$
C.1.8 Action: Maintain the FWP AIS Dive Team to serve as a resource to conduct targeted AIS survey and removal.	FWP	USFWS	State funds and federal grants.	Existing	Ongoing	\$

Objective C: Early Detection						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy C.1. Cont. C.1.9 Action: Continue operation of the FWP AIS Lab to process samples for mussel veligers and diagnostic services for aquatic plants and animals. Explore other early detection and diagnostic services the lab can provide.	FWP	USFWS	State funds and federal grants.	Existing	Ongoing	\$
C.1.10 Action: In Cooperation with the Montana Heritage Program; collect, review, and maintain AIS sampling databases in a manner to be used effectively by state, federal, and other interested parties.	FWP	MNHP	State funds and federal grants.	Existing	Ongoing	\$
C.1.11 Action: Support and integrate new technologies or methods as they develop and mature.	FWP	WMCC, CEMIST	State funds and federal grants.	Existing	Ongoing	\$
B.1.12 Action: Coordinate with and train private entities to provide inspections to address gaps (e.g. ballast boat mechanics, boat rental businesses).	FWP	Private Businesses	State funds and federal grants.	Existing	Ongoing	\$

Objective D: Rapid Response and Preparedness						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy D.1: Maintain response preparedness						
D.1.1 Action: Annual evaluation of the Dreissenid Rapid Response Guidelines and update if needed.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$\$\$
D.1.2 Action: Develop response guidelines for other high risk AIS species.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
D.1.3 Action: Annually provide staff with Incident Command System (ICS) training and hold refresher training to ensure a base level of response preparedness.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
D.1.4 Action: Conduct annual ICS-based exercises with FWP and partners to maintain preparedness for an efficient response to a new AIS detection. Explore training exercises for response to dreissenids and other high priority AIS species.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$

Objective E: Control and Eradicate						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy E.1. Prepare treatment strategies for new AIS detections						
E.1.1 Action: Compile response strategies for treatment of new AIS detections.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
E.1.2 Action: Identify funding sources for rapid response treatment actions.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	N/A	Existing	Ongoing	\$
E.1.3 Action: Identify and preemptively address rapid response treatment regulatory requirements.	FWP	State & Federal Agencies, Counties, Tribes	State funds and federal grants.	Existing	Ongoing	\$\$
E.1.4 Action: Proactively develop Environmental Assessments (EA) for treatment of high-risk species, if required.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
E.1.5 Action: Continue ongoing training and preparation of the AIS dive team for rapid response survey and treatment.	FWP	USFWS	State funds and federal grants.	Existing	Ongoing	\$

Objective E: Control and Eradicate						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy E.1. Cont. E.1.6 Action: Identify contractors that can conduct AIS treatments or provide and install silt curtains.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
Strategy E.2: Control or eradicate existing AIS population where reasonable						
E.2.1 Action: Conduct eradication projects on existing high-priority AIS populations within the state.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$
E.2.2 Action: Provide sampling or control support and expertise to partners who are engaged in AIS treatment projects.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist.	State funds and federal grants.	Existing	Ongoing	\$

Objective F: Outreach, Education and Behavior Change						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy F.1: Provide outreach and awareness about AIS through diverse efforts.						
F.1.1 Action: Hold an annual AIS meeting to update partners on AIS outreach efforts and program achievements. Coordinate new initiatives and projects.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs	State funds and federal grants.	Existing	Ongoing	\$
F.1.2 Action: Develop and maintain an AIS outreach plan that will target information to boaters, anglers, other water users, the general public, agencies and private industry. The plan will include the development of targeted outreach strategies for ballast boat owners, wading anglers, waterfowl hunters, aquarium pet owners, and ornamental pond owners.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, NGOs, WMCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.3 Action: Evaluate the AIS outreach plan and update as needed.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist. NOGs, MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.4 Action: Provide training for FWP personnel and other interested parties to prevent the spread of AIS during field work or other activities.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$

Objective F: Outreach, Education and Behavior Change						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy F.1. Cont.						
F.1.5 Action: Provide easy public access with up-to-date AIS distribution information in the state.	FWP	State & Federal Agencies, Counties, Tribes, Conservation Districts, MNHP	State funds and federal grants.	Existing	Ongoing	\$
F.1.6 Action: Facilitate the dissemination of information, research, and data on AIS.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants	Existing	Ongoing	\$
F.1.7 Action: Expand and identify new approaches for web-based information on AIS in Montana.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.8 Action: Explore expanding the use of Geofencing to better target AIS messages to specific areas.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.9 Action: Continue to engage and involve partners to deliver accurate and consistent AIS information at the local level.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$

Objective F: Outreach, Education and Behavior Change						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy F.1. Cont.						
F.1.10 Action: Create targeted community based social marketing messages to reinforce the Clean Drain Dry and Don't let it Loose campaigns.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.11 Action: Explore outreach methods that are most effective to reach specific audiences including print, radio, tv, social media, video segments and other targeted media approaches.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.12 Action: Provide "train the trainer" instruction to natural resource professionals, educators, conservation districts, and others to expand the reach of AIS outreach and awareness state-wide.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.13 Action: Expand social media presence with short training videos, novel messaging and educational memes.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$
F.1.14 Action: Continue industry outreach efforts state-wide with water-based private businesses.	FWP	State & Federal Agencies, Counties, Tribes, Cons. Dist., MWCC	State funds and federal grants.	Existing	Ongoing	\$

Objective G: Evaluation of Laws and Rules						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy G.1: Regularly review laws to determine gaps and needs that could be changed to improve the efficacy and efficiency of the AIS program.						
G.1.1 Action: Review feasibility of legislative action to more clearly define roles and responsibilities between state agencies responsible for AIS through Title 80 to ensure effective and efficient program coordination and implementation. Currently AIS responsibilities in statute are equally shared between FWP, MDA, MDT and DNRC with roles and responsibilities defined in MOU.	MISC	State agencies, Tribes, Counties, Conservation Districts, MWCC	State funds and federal grants.	For Consideration	One-time	\$
G.1.2 Action: Review feasibility of creating an AIS species list that would provide a single list of aquatic invasive plants and animals that provides clear management authority.	MISC	State agencies, Tribes, Counties, Conservation Districts, MWCC	State funds and federal grants.	For Consideration	One-time	\$
G.1.2.1 Action: Identify additional species to be added to the prohibited species list.	FWP	State agencies, Tribes, Counties, Conservation Districts	State funds and federal grants.	Existing	Ongoing	\$

Objective G: Evaluation of Laws and Rules						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy G.1. Cont.						
G.1.3 Action: Review the feasibility and need for a pull the plug requirement for watercraft.	MISC	State and federal agencies, tribes, counties, Cons. Distr., WMCC	State funds and federal grants	For Consideration	One-Time	\$
G.1.4 Action: Review the feasibility and need for increased penalties for watercraft that fail to stop at inspection stations.	MISC	State and federal agencies, tribes, counties, Cons. Distr., WMCC	State funds and federal grants	For Consideration	One-Time	\$
G.1.5 Action: Evaluate the effectiveness and utility of the AIS Trust Fund.	MISC	State and federal agencies, tribes, counties, Cons. Distr., WMCC	State funds and federal grants	For Consideration	One-Time	\$
G.1.7 Action: Review overlapping AIS responsibilities shared by the WMCC and the state-wide AIS program managed by FWP.	MISC	State and federal agencies, tribes, counties, Cons. Distr., WMCC	State funds and federal grants	For Consideration	One-Time	\$

Objective G: Evaluation of Laws and Rules						
Actions	Lead Organization	Cooperating Organizations	Funding Source	Status	Frequency	Order of Magnitude of Cost
Strategy G.1. Cont. G.1.8 Action: Evaluate statutory requirements for integrating technology-based requirements to help ensure boaters meet inspection before launch requirements.	MISC	State and federal agencies, tribes, counties, Cons. Distr., WMCC	State funds and federal grants	For Consideration	One-Time	\$

Definitions

Aquatic invasive species	A nonnative, aquatic species that has caused, is causing, or is likely to cause harm to the economy, environment, recreational opportunities, or human health. Often referred to as AIS and occasionally as ANS.
Baitfish	A fish species commonly sold for use as bait for recreational fishing.
Ballast water	Any solid or liquid that is brought on board a watercraft to manipulate the trim and stability.
Control	Limiting the distribution and abundance of a species.
Early detection	A process of surveying for, reporting and verifying the presence of a non-native species before the founding population becomes established or spread so widely that eradication is no longer feasible.
Environmental DNA	The genetic material (e.g., from feces, mucous, gametes, shed skin, scales and hair, carcasses) produced by organisms that is collected from environmental samples such as water, soil or air.
Ecosystem	A biological community of interacting organisms and their physical environment.
Eradicate	The process of eliminating a species.
Non-indigenous species	A species that enters an ecosystem beyond its historic range.
Monitoring	Methodical sampling or observations to determine presence / absence of species, population dynamics or characterize species information.
Pathway	The means by which species are transported from one location to another. Natural pathways include wind, currents and other forms of dispersal. Human pathways are those that are enhanced or created by human activity, including intentional and unintentional pathways.
Priority species	An aquatic invasive species that is considered to be a significant threat to Montana waters and is recommended for immediate or continued management action to minimize or eliminate their impact.
Rapid response	A process that is employed to eradicate the founding population of a non-native species from a specific location before it becomes established or spreads so widely that eradication is no longer feasible.
Watershed	An entire drainage basin including all living and nonliving components.
Vector	An organism or object that transmits another organism/disease/parasite from one animal or plant to another.

Literature Cited

Andersen, M.C., H. Adams, B. Hope, and M. Powell. 2004. Risk Assessment for Invasive Species. *Risk Analysts* 24: 787-793

Aquatic Nuisance Species Task Force and the National Invasive Species Council. 2007. Training and Implementation Guide for Pathway Definition, Risk Analysis and Risk Prioritization. Aquatic Invasive Species Task Force and National Invasive Species Council, Washington, D.C., pp 56.

Ara, S., E. Irwin, and T. Haab. 2006. The influence of water quality on housing price around Lake Erie. Selected paper presented at the 2006 American Agricultural Economics Association Annual Meeting, Long Beach, California, July 2006.

Baron, A., W. Zhang, and E. Irwin. 2016. Estimating the capitalization of harmful algal bloom incidence, intensity and duration? A repeated sales model of Lake Erie lakefront property values. Selected paper for presentation at the 2016 Agricultural & Applied Economics Association Annual Meeting, Boston, Massachusetts.

Beaury, E. M., E. J. Fusco, M.R. Jackson, B.B. Laginhas, T.L. Morelli, J.M. Allen, V.J. Pasquarella and B.A. Bradley. 2020. Incorporating climate change into invasive species management: insights from managers. *Biological Invasions* 22: 233-252.

Bingham, M., S. Sinha, and F. Lupi. 2015. Economic benefits of reducing harmful algal blooms in Lake Erie. Report submitted to the International Joint Commission Environmental Consulting & Technology, Inc., Report, 66 pp.

Bradley, B. A., E. Beaury, E. J. Fusco, B. Laginhas, T. L. Morelli, and V. Pasquarella. 2018. Regional Invasive Species and Climate Change Management Challenge: Preparing for Sleeper Species. Environmental Conservation Educational Materials. <https://doi.org/10.7275/R5F18WXT>

Bureau of Reclamation. 2021. Costs associated with invasive mussel impacts and management. Science and Technology Program Research and Development Office. Final Report No. ST-2021-8142-01, 35 pp.

California Department of Food and Agriculture. 2014. Model Rapid Response Plan for Aquatic Nuisance Species prepared for the Western Regional Panel on Aquatic Nuisance Species. 54 pp.

Colberg, E. M., Bradley, B. A., Morelli, T. L., and C.J. Brown-Lima. 2024. Climate-Smart Invasive Species Management for 21st Century Global change challenges. *Global Change Biology*, 30(10). <https://doi.org/10.1111/gcb.17531>

Creative Resource Strategies, LLC. 2016. Montana Management Assessment of Invasive Species, a report prepared for the Montana Invasive Species Advisory Council. Helena, MT. 66 pp.

Columbia Basin Cooperative Weed Management Area (CBCWMA). 2019. Columbia Basin Flowering Rush Management Plan: A regional strategy to address *Butomus umbellatus* throughout the Columbia Basin. Pp 67.

Crystal-Ornelas R., E.J. Hudgins, R.N. Cuthbert, P.J. Haubrock, J. Fantle-Lepczyk, E. Angulo, A.M. Kramer, L. Ballesteros-Mejia, B. Leroy, B. Leung, E. Lopez-Lopez, C. Diagne and F. Courchamp. 2021. Economic costs of biological invasions within North America. *NeoBiota* 67: 485-510.

Diagne C., B. Leroy, A.-C. Vaissiere, R.E. Gozlan, R. Roiz, I. Jaric, J.-M. Salles, C. J.A. Bradshaw and F. Courchamp. 2022. High and rising economic costs of biological invasions worldwide. *Nature* 592, 571-576.

Environmental Protection Agency. 2016. What climate change means for Montana. EPA 430-F-16-028.

Fantle-Lepczyk, J.E., P.J. Haubrock, A.M. Kramer, R.N. Cuthbert, A.J. Turbelin, R. Crystal-Ornelas, C. Diagne, and F. Courchamp. 2022. Economic costs of biological invasions in the United States. *Science of the Total Environment*, 806: 151318. <https://doi.org/10.1016/j.scitotenv.2021.151318>.

Heimowitz, P. and S. Phillips. 2018. Columbia River Basin Interagency Invasive Species Response Plan: Dreissenid Species. Pacific States Marine Fisheries Commission, Portland, OR. 253 pp.

Henshall, J. A. 1906. A List of the Fishes of Montana with Notes on the Game Fishes. University of Montana, Missoula.

Horsch, E.J., and D.J. Lewis. 2009. The effects of aquatic invasive species on property values: evidence from a quasi-experiment. *Land Economics* 85(3): 391–409.

Invasive Species Advisory Committee. 2023. Invasive Species Threaten the Success of Climate Change Adaptation Efforts. Washington, DC. pp 11.

Johnson, L.E., A. Ricciardi, and J.T. Carlton. 2001. Overland dispersal of aquatic invasive species: A risk assessment of transient recreational boating. *Ecological Application* 11:1789-1799.

Lee II, H. D.A. Reusser, J.D. Olden, S.S. Smith, J. Graham, V. Burkett, J.S. Dukes, R. J. Piorkowski, and J. McPhedran. 2008. Integrated monitoring and information systems for managing aquatic invasive species in a changing climate. *Conservation Biology*, <https://doi.org/10.1111/j.1523-1739.2008.00955.x>

Lockwood, J.L., D.J. Welbourne, C.M. Romagosa, P. Cassey, N.E. Mandrak, A. Strecker, B. Leung, O.C. Stringham, B. Udell, D.J. Episcopio-Sturgeon, M.F. Tlusty, J. Sinclair, M.R. Springborn, E.F. Pienaar, A.L. Rhyne, and R. Keller. 2019. When pets become pests: the role of the exotic pet trade in producing invasive vertebrate animals. *Frontiers in Ecology and the Environment* 17:323-330.

Lonsdale, W. R., Cross, W. F., Dalby, C. E., Meloy, S. E., Schwend, A. C., 2020. Evaluating Irrigation Efficiency: Toward a Sustainable Water Future for Montana, Montana University System Water Center, Montana State University, 42p., doi.org/10.15788/mwc202011

Luce, C.H. 2017. Effects of climate change on snowpack, glaciers, and water resources in the Northern Rockies. In: *Climate Change and Rocky Mountain Ecosystems*, eds Halofsky, J. and D. Peterson. https://doi.org/10.1007/978-3-319-56928-4_3

Montana Aquatic Invasive Species Management Plan

Mack, R.N., D. Simberloff, W.M. Lonsdale, H. Evenas, M. Clout, and F.A. Bazzaz. 2000. Biotic invasions: causes, epidemiology, global consequences and control. *Ecological Applications* 10:689-710.

Mainka, S.A. and G.W. Howard. 2010. Climate change and invasive species: double jeopardy. *Integrative Zoology*, <https://doi.org/10.1111/j.1749-4877.2010.00193.x>

Mari, L., E. Bertuzzo, R. Casagrandi, M. Gatto, S.A. Levin, I. Rodriguez-Iturbe, and A. Rinaldo. 2011. Hydrologic controls and anthropogenic drivers of the zebra mussel invasion of the Mississippi-Missouri river system. *Water Resources Research* 47: 1-16.

Montana Department of Agriculture. 2017. Montana Noxious Weed Management Plan. Helena, MT. 55 pp.

Montana Fish, Wildlife & Parks. 2008. Statewide Integrated Noxious Weed Management Plan. Helena, MT. 100 pp.

Montana Fish, Wildlife & Parks. 2018. The State of Montana's Dreissenid Mussel Rapid Response Guidelines. 21 pp.

Montana Fish, Wildlife & Parks. 2019. Aquatic Invasive Species Management Program Field Sampling and Laboratory Standard Operating Procedures. Helena, MT. 70 pp.

Montana Fish, Wildlife & Parks. 2023. Montana Statewide Fisheries Management Plan. Helena, MT. 200 pp.

Montana Invasive Species Council. 2016. Governor's Summit on Invasive Species Summary Report. Helena, MT. 12 pp.

Montana Invasive Species Council. 2016. Montana Invasive Species Framework. Helena, MT. 20 pp.

Montana Invasive Species Council. 2018. Invasive Species Law Review Compendium. Helena, MT. 335 pp.

Montana Invasive Species Council. 2018. Dreissenid eDNA Science Advisory Panel Report. Helena, MT. 51 pp.

Montana Invasive Species Council. 2020. State of Montana's Invasive Species Rapid Response Guidelines. Helena, MT. 19 pp.

Montana Natural Heritage Program. Montana Field Guide <https://fieldguide.mt.gov/>; accessed 2024.

Nelson, N.M. 2019. Enumeration of potential economic costs of dreissenid mussel infestation in Montana. University of Montana, Missoula, MT. 39 pp.

National Wildfire Coordinating Group. 2018. Decontaminating firefighting equipment to reduce the spread of aquatic invasive species: How to guide for the Northern Rockies Wildlife Management Team. 14 pp.

Olden, J.E. Whattam, and S.A. Wood. 2021. Online auction marketplaces as a global pathway for aquatic invasive species. *Hydrobiologia* 848:1967-1979.

Pacific States Marine Fisheries Commission, Invasive Species Action Network and the U.S. Fish and Wildlife Service. 2021. Columbia River Basin AIS Team: Moss Ball Incident Action Report, Recommendations and Key Findings. 22 pp.

Padilla, D.K. and S.L. Williams. 2004. Beyond ballast water: aquarium and ornamental trades as sources of invasive species in aquatic ecosystems. *Frontiers in Ecology and the Environment* 2: 131 -138.

Parkinson H., J. Mangold and C. McLane. 2016. Curlyleaf Pondweed. Montana State University Extension Publications. 12 pp.

Pimentel D., R. Zuniga and D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics* 3:273-288.

Rahel F.J., and J.D. Olden. 2008. Assessing the effects of climate change on aquatic invasive species. *Conservation Biology* 22:521-533 <https://doi.org/10.1111/j.1523-1739.2008.00950.x>

Ricciardi, A., Iacarella, J.C., Aldridge, D.C., Blackburn, T.M., Carlton, J.T., Catford, J.A., Dick, J.T., Hulme, P. E., Jeschke, J.M., Liebhold, A.M., Lockwood, J.L., MacIsaac, H.J., Meyerson, L.A., Pyšek, P., Richardson, D. M., Ruiz, G.M., Simberloff, D., Vilà, M., and Wardle, D.A. 2020. Four priority areas to advance invasion science in the face of rapid environmental change. *Environmental Reviews*, 29(2), 119–141. doi.org/10.1139/er-2020-0088

Rumzie, N., R. Christopherson, S. O’Meara, Y. Passamaneck, A. Murphy, S. Pucherelli, and J. Trujillo. 2021. Costs associated with invasive mussels impacts and management. Science and Technology Program, Research and Development Office, Final Report No. ST2021 814201.

State of Montana. 2020. Montana Climate Solutions Plan. Helena, MT. pp. 73.

Vilizzi, L., G.H. Copp, J. E. Hill, B. Adamovich, L. Aislabie, D. Akin, A. J. Al-Faisal, D. Almeida, M. N. A. Azmai, R. Bakiu, A. Bellati, R. Bernier, J. M. Bies, G. Bilge, P. Branco, T. D. Bui, J. Canning-Clode, H. A. C. Ramos, G. A. Castellanos-Galindo, N. Castro, and S. Clarke. 2021. A global-scale screening for non-native aquatic organisms to identify potentially invasive species under current and future climate conditions. *Science of the Total Environment*. <https://doi.org/10.1016/j.scitotenv.2021.147868>

Vincent, R.E. 1972. Effect of stocking catchable trout on wild trout populations. Western Division American Fisheries Society Meeting, Portland OR. Presentation abstract.

Vissichelli, M. 2018. Invasive species impacts on federal infrastructure. Report for the National Invasive Species Council Secretariat. Deliverable for agreement # IAA4500109775. National Invasive Species Council Secretariat, Washington, DC.

Walsh, P.J., J.W. Milon, and D.O. Scrogin. 2011. The spatial extent of water quality benefits in urban housing markets. *Land Economics* 87(4): 628–644.

Montana Aquatic Invasive Species Management Plan

Western Regional Panel on ANS. 2010. Quagga-Zebra Mussel Action Plan for Western U.S. Waters. Aquatic Nuisance Species Task Force, Washington, D.C. 45 pp.

Western Regional Panel on Aquatic Nuisance Species. 2014. Model Rapid Response Plan for Aquatic Nuisance Species. 54 pp.

Western Regional Panel on ANS. 2019. Building Consensus in the West Workgroup: Final Activity Report 2011-2019. 28 pp.

Western Regional Panel on ANS. 2020. Updated Recommendations for the Quagga and Zebra Mussel Action Plan for Western Waters. 32 pp.

Whitlock C., W. Cross, B. Maxwell, N. Silverman, and A.A. Wade. 2017. 2017 Montana Climate Assessment. Bozeman and Missoula MT: Montana State University and University of Montana, Montana Institute on Ecosystems. 318 pp. doi:10.15788/m2ww8w.

Woolway, R.I., S. Sharma and J.P. Smol. 2022. Lakes in hot water: The impacts of a changing climate on aquatic ecosystems. *BioScience*, 772:1050-1061.

Zhang C. and K.J. Boyle. 2010. The effect of an aquatic invasive species (Eurasian watermilfoil) on lakefront property values. *Ecological Economics* 2:394-404.

Appendices

- A. Summary of Public Comments
- B. Exotic and Prohibited Species
- C. Noxious Weed List
- D. Federal Entities and Authorities
- E. Interagency MOU on AIS Management
- F. Montana AIS Laws, Rules and Statutes

Appendix A. Summary of Public Comments

Comments/Addressed from Montana partners and the ANSTF members will be included here in final version

Appendix B. Exotic and Prohibited Species

The information provided here including species and associated Montana code or administrative rules were accessed in 2024 and may be subject to change based on legislative or rule changes. All language here is as it appears in code.

MCA 87-5-709 or ARM 12.6.2220 Exotic Prohibited Species

Prohibited species are live, exotic wildlife species, subspecies, or hybrid of that species, including viable embryos or gametes, that may not be possessed, sold, purchased, exchanged, or transported in Montana, except as provided in MCA 87-5-709 or ARM 12.6.2220

- (1) The following amphibians are classified as prohibited species:**
 - (a) African clawed frog – *Xenopus laevis*; and
 - (b) North American bullfrog – *Lithobates catesbeianus*.
- (2) The following crustaceans are classified as prohibited species:**
 - (a) Rusty crayfish – *Orconectes rusticus*.
- (3) The following fish are classified as prohibited species:**
 - (a) Bighead carp – *Hypophthalmichthys nobilis*;
 - (b) Black carp – *Mylopharyngodon piceus*;
 - (c) Eurasian Ruffe – *Gymnocephalus cernuus*;
 - (d) Grass carp – *Ctenopharyngodon idella*;
 - (e) Round goby – *Neogobius melanostomus*;
 - (f) Silver carp – *Hypophthalmichthys molitrix*;
 - (g) Snakehead fish – genera *Channa* and *Parachanna* (29 species);
 - (h) Walking catfish – *Clarias batrachus*;
 - (i) White perch – *Morone Americana*; and
 - (j) Zander (European pikeperch) – *Sander lucioperca*.
- (4) The following mammals are classified as prohibited species:**
 - (a) Addax (*Addax nasomaculatus*)
 - (b) African Soft Fur Rat/Natal Rat – *Mastomys natalensis*/Natal multimammate mouse;
 - (c) Aotidae Family (Night and Owl Monkeys);
 - (d) Argali Sheep – *Ovis ammon*;
 - (e) Atelidae Family (Howlers and Spider Monkeys);
 - (f) Brush-tailed possum – *Trichosurus vulpecula*;
 - (g) Callitrichidae Family (Marmosets and Tamarins);
 - (h) Cebidae family (new world primates);
 - (i) Cercopithecidae family (old world monkeys);
 - (j) Hyaenidae family (hyenas);
 - (k) Hylobatidae family (gibbons);
 - (l) Natal Rat/African Soft Fur Rat – Natal multimammate mouse/*Mastomys natalensis*;
 - (m) Nutria – *Myocastor coypus*;
 - (n) Pitheciidae Family (Titis and Saki Monkeys);
 - (o) Pongidae family (apes);
 - (p) Short-tailed opossum – *Monodelphis domestica*;
 - (q) Small spotted genet – *Genetta genetta*;
 - (r) Southern flying squirrel – *Glaucomys volans*;
 - (s) Transcaspian ural sheep – *Ovis aries vignei*; and
 - (t) Virginia opossum – *Didelphis virginiana*.

(5) The following mollusks are classified as prohibited species:

- (a) New Zealand mudsnail – *Potamopyrgus antipodarum*;
- (b) Quagga mussel – *Dreissena bugensis*; and
- (c) Zebra mussel – *Dreissena polymorpha*.

(6) The following reptiles are classified as prohibited:

- (a) African rock python – *Python sebae*;
- (b) Alligatoridae family;
- (c) Amethystine python – *Morelia amethystina*;
- (d) Boomslang – *Dispholidus typus*;
- (e) Burrowing asps (all species in family Atractaspidae);
- (f) Coral snakes (all species in family Elapidae);
- (g) Cobras (all species in family Elapidae);
- (h) Crocodylidae family;
- (i) Green Anaconda – *Eunectes marinus*;
- (j) Indian python (including the Burmese python) – *Python molurus*;
- (k) Kraits (all species in family Elapidae);
- (l) Mambas (all species in family Elapidae);
- (m) Pit vipers and true vipers (all species in family Viperidae except species indigenous to MT);
- (n) Red-eared slider – *Trachemys scripta elegans*; and
- (o) Reticulated python – *Python reticulatus*.

(7) The following birds are classified as prohibited:

- (a) California quail – *Callipepla californica*; and
- (b) Gambel's quail – *Callipepla gambelii*.

ARM 12.6.2205 or MCA 87-5-706 Exotic Wildlife: Noncontrolled Species

Noncontrolled species are live, exotic wildlife species, subspecies, or hybrid of that species that may be possessed, sold, purchased or exchanged in the state without a permit, except as provided in this subchapter or in Montana statutes or federal statutes. An uncontrolled species may not be released into the wild unless authorized in writing by Fish Wildlife & Parks.

(a) tropical and subtropical birds in the order Passeriformes, including but not limited to birds in the families:

- (i) Sturnidae (mynahs);
- (ii) Ramphastidae (toucans, toucanettes);
- (iii) Fringillidae (siskins);
- (iv) Estrildidae (finches);
- (v) Emberizidae (cardinals);
- (vi) Ploceidae (weavers);
- (vii) Timaliidae (mesias);
- (viii) Viduinae (wydahs);
- (ix) Thraupidae (tanagers);
- (x) Zosteropidae (zosterops);
- (xi) Psittacidae (parrots);
- (xii) Loriidae (lories); and
- (xiii) Cacatuidae (cockatoos);

(b) **nonnative species in the subfamily Phasianae**, except:

- (i) chukar partridge (*Alectoris chukar*);
- (ii) gray (Hungarian) partridge (*Perdix perdix*);
- (iii) ring-necked pheasant (*Phasianus colchicus*); and
- (iv) turkey (*Meleagris gallopavo*);

(c) **all tropical fish, subtropical fish, marine fish**, common goldfish (*Carassius auratus*), and koi (*Cyprinus carpio*) for use in residential and office aquariums;

(d) unless otherwise regulated pursuant to 87-5-116, **all nonnative tropical and subtropical species of nonvenomous snakes** not on the controlled or prohibited lists in the families:

- (i) Boidae (boas);
- (ii) Bolyeriidae (Round Island Boas);
- (iii) Tropidophiidae (dwarf boas);
- (iv) Pythonidae (pythons);
- (v) Colubridae (modern snakes);
- (vi) Acrochordidae (file and elephant trunk snakes);
- (vii) Xenopeltidae (sunbeam snakes);
- (viii) Aniliidae (pipe snakes);
- (ix) Uropeltidae (shield-tailed snakes);
- (x) Anomalepididae (blind snakes);
- (xi) Leptotyphlopidae (blind snakes); and
- (xii) Typhlopidae (blind snakes);

(e) unless otherwise regulated pursuant to 87-5-116, **all nonnative tropical and subtropical species of nonvenomous lizards** not on the controlled or prohibited lists, including but not limited to the following families or subfamilies:

- (i) Agamidae (chisel-teeth lizards);
- (ii) Amphisbaenidae (worm lizards);
- (iii) Anelytropsidae (limbless lizards);
- (iv) Anguidae (glass and alligator lizards);
- (v) Anniellidae (legless lizards);
- (vi) Chamaeleonidae (chameleons);
- (vii) Cordylidae (girdle-tailed lizards);
- (viii) Corytophanidae (casquehead lizards);
- (ix) Crotaphytidae (collared and leopard lizards);
- (x) Dibamidae (blind lizards);
- (xi) Eublepharidae (eyelid geckos);
- (xii) Feyliniidae (African snake skinks);
- (xiii) Gekkonidae (geckos);
- (xiv) Helodermatidae (beaded lizards and gila monsters);

Montana Aquatic Invasive Species Management Plan

- (xv) Iguanidae (iguanas);
- (xvi) Lacertidae (wall lizards);
- (xvii) Lanthanotidae (earless monitor);
- (xviii) Phrynosomatidae (earless, spiny, and horned lizards);
- (xix) Polychrotidae (anoles);
- (xx) Pygopodidae (snake lizards);
- (xxi) Scincidae (skinks);
- (xxii) Teiidae (whiptail);
- (xxiii) Tropiduridae (neotropical ground lizards);
- (xxiv) Varanidae (monitor lizard);
- (xxv) Xantusiidae (night lizards); and
- (xxvi) Xenosauridae (knob-scaled lizards);

(f) unless otherwise regulated pursuant to 87-5-116, **all nonnative tropical and subtropical species of turtles with a carapace or shell length of more than 4 inches** and not on the controlled or prohibited lists in the families:

- (i) Carettochelyidae (New Guinea softshell turtles);
- (ii) Chelidae (snake-necked turtles);
- (iii) Chelydridae (snapping turtles);
- (iv) Dermatemydidae (Central American river turtle);
- (v) Emydidae (pond turtles);
- (vi) Kinosternidae (mud turtles and musk turtles);
- (vii) Pelomedusidae (hidden-necked turtles);
- (viii) Platysternidae (big-headed turtle);
- (ix) Testudinidae (tortoises); and
- (x) Trionychidae (soft-shelled turtles);

(g) unless otherwise regulated pursuant to 87-5-116, **all nonnative tropical and subtropical species of frogs and toads** not on the controlled or prohibited lists in the families:

- (i) Atelopodidae (harlequin frogs);
- (ii) Bufonidae (true toads);
- (iii) Centrolenidae (glass frogs);
- (iv) Dendrobatidae (poison dart frogs);
- (v) Hylidae (tree frogs);
- (vi) Leptodactylidae (rain frogs);
- (vii) Microhylidae (narrow-mouthed toads);
- (viii) Pelobatidae (spadefoot toads);
- (ix) Pelodytidae (old world spadefoot toads);
- (x) Ranidae (true frogs, except bullfrogs, *Rana catesbeiana*);
- (xi) Rhacophoridae (old world tree frogs); and
- (xii) Rhinophrynidae (Mexican burrowing frog);

(h) unless otherwise regulated pursuant to 87-5-116, all nonnative tropical and subtropical species of limbless amphibians not on the controlled or prohibited lists in the families:

- (i) Caeciliidae (caecilians);
- (ii) Ichthyophiidae (fish caecilians);
- (iii) Rhinatrematidae (beaked caecilians);
- (iv) Scolecomorphidae (tropical caecilians); and
- (v) Uraeotyphlidae (Indian caecilians); and

(i) unless otherwise regulated pursuant to 87-5-116, **all nonnative tropical and subtropical species of salamanders** not on the controlled or prohibited lists in the families:

- (i) Ambystomatidae (mole salamanders);
- (ii) Amphiumidae (amphiumas);
- (iii) Cryptobranchidae (hellbenders);
- (iv) Dicamptodontidae (giant salamanders);
- (v) Hynobiidae (Asian salamanders);
- (vi) Plethodontidae (woodland salamanders);
- (vii) Proteidae (waterdogs);
- (viii) Salamandridae (newts, except for rough-skinned newt, *Taricha granulosa*); and
- (ix) Sirenidae (sirens).

(2) The commission may by rule authorize the possession or sale of other species of noncontrolled exotic wildlife that are not listed in subsection (1) if it is determined that the other species present minimal disease, ecological, environmental, safety, or health risks.

ARM 12.6.2208 or ARM 12.6.2204 Exotic Wildlife: Controlled Species

Controlled species means live, exotic wildlife species, subspecies, or hybrid of species that may not be imported, possessed, sold, purchased or exchanged in Montana unless a person obtains written authorization from the department.

- (1) There are 19 species or families of species of birds classified as controlled species.
- (2) The following crustaceans are classified as controlled species:
 - (a) Pacific white shrimp (*Panaeus vannamei*)
- (3) The following fish are classified as controlled species:
 - (a) Coho salmon (*Onocorhynchus kisutch*)
 - (b) Koi (*Cyprinus carpio*)
 - (c) Goldfish (*Carrassius auratus*)

Appendix C. Noxious Weed List

Montana Department of Agriculture

Effective: June 21, 2019

PRIORITY 1A These weeds are not present or have a very limited presence in Montana. Management criteria will require eradication if detected, education, and prevention:

- (a) Yellow starthistle (*Centaurea solstitialis*)
- (b) Dyer's woad (*Isatis tinctoria*)
- (c) Common reed (*Phragmites australis ssp. australis*)
- (d) Medusahead (*Taeniatherum caput-medusae*)

PRIORITY 1B These weeds have limited presence in Montana.

Management criteria will require eradication or containment and education:

- (a) Knotweed complex (*Polygonum cuspidatum*, *P. sachalinense*, *P. × bohemicum*, *Fallopia japonica*, *F. sachalinensis*, *F. × bohemica*, *Reynoutria japonica*, *R. sachalinensis*, and *R. × bohemica*)
- (b) Purple loosestrife (*Lythrum salicaria*)
- (c) Rush skeletonweed (*Chondrilla juncea*)
- (d) Scotch broom (*Cytisus scoparius*)
- (e) Blueweed (*Echium vulgare*)

PRIORITY 2A These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

- (a) Tansy ragwort (*Senecio jacobaea*, *Jacobaea vulgaris*)
- (b) Meadow hawkweed complex (*Hieracium caespitosum*, *H. praealtum*, *H. floridundum*, and *Pilosella caespitosa*)
- (c) Orange hawkweed (*Hieracium aurantiacum*, *Pilosella aurantiaca*)
- (d) Tall buttercup (*Ranunculus acris*)
- (e) Perennial pepperweed (*Lepidium latifolium*)
- (f) Yellowflag iris (*Iris pseudacorus*)
- (g) Eurasian watermilfoil (*Myriophyllum spicatum*, *Myriophyllum spicatum* x *Myriophyllum sibiricum*)
- (h) Flowering rush (*Butomus umbellatus*)
- (i) Common buckthorn (*Rhamnus cathartica* L.)
- (j) Ventenata (*Ventenata dubia*)

PRIORITY 2B These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

- (a) Canada thistle (*Cirsium arvense*)
- (b) Field bindweed (*Convolvulus arvensis*)
- (c) Leafy spurge (*Euphorbia esula*)
- (d) Whitetop (*Cardaria draba*, *Lepidium draba*)

Montana Aquatic Invasive Species Management Plan

- (e) Russian knapweed (*Acroptilon repens*, *Rhaponticum repens*)
- (f) Spotted knapweed (*Centaurea stoebe*, *C. maculosa*)
- (g) Diffuse knapweed (*Centaurea diffusa*)
- (h) Dalmatian toadflax (*Linaria dalmatica*)
- (i) St. Johnswort (*Hypericum perforatum*)
- (j) Sulfur cinquefoil (*Potentilla recta*)
- (k) Common tansy (*Tanacetum vulgare*)
- (l) Oxeye daisy (*Leucanthemum vulgare*)
- (m) Houndstongue (*Cynoglossum officinale*)
- (n) Yellow toadflax (*Linaria vulgaris*)
- (o) Saltcedar (*Tamarix spp.*)
- (p) Curlyleaf pondweed (*Potamogeton crispus*)
- (q) Hoary alyssum (*Berteroa incana*)

PRIORITY 3 Regulated Plants: (NOT MONTANA LISTED NOXIOUS WEEDS)

These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.

- (a) Cheatgrass (*Bromus tectorum*)
- (b) Hydrilla (*Hydrilla verticillata*)
- (c) Russian olive (*Elaeagnus angustifolia*)
- (d) Brazilian waterweed (*Egeria densa*)
- (e) Parrot feather watermilfoil (*Myriophyllum aquaticum* or *M. brasiliense*)

Appendix D. Federal Entities and Authorities

No single federal agency has clear authority over all aspects of AIS management, but many agencies have programs and responsibilities that address aspects of AIS. Federal activities on AIS management are coordinated through the national Aquatic Nuisance Species Task Force.

The **Bureau of Indian Affairs** (BIA) mission is to enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and improve the trust assets of American Indians, Indian Tribes, and Alaska Natives. BIA's program, Stewardship of Natural Resources and Science in Indian Country, addresses resource management and decision-making in invasive species. BIA provides funding to Montana Tribes to support AIS prevention and early detection efforts.

The **Bureau of Land Management** (BLM) implements multiple strategies in combating invasive species. These include BLM's Partners Against Weeds Plan (PAW), the Department of the Interior's Invasive Plant Management Plan, and the National Invasive Species Management Plan. Also, as part of its implementation of the National Fire Plan, the BLM acts to reduce invasive weeds that function as fire fuels and works with partners to enhance native plant restoration. In treating infestations, the BLM uses an integrated management approach that employs the method or combination of methods that will have the greatest positive effect with the minimum negative environmental impact. The BLM uses biological, mechanical, and chemical control methods. It is BLM policy to use chemical pesticides only after considering alternative methods. Volunteers and partners play a significant role in helping land managers remove invasive species from public lands. Management of animal species, including invasive animals, on BLM lands is completed in cooperation with partnering state and federal agencies. The BLM also provides grant funding to support AIS prevention, early detection, and outreach activities in Montana.

Bureau of Reclamation (BOR) facilities include thousands of miles of water distribution canals, rights-of-way, wetlands, wildlife resources, recreational areas, and reservoirs which are at significant risk of damage or disruption by weeds and other pests (including algae and mollusks). There are numerous BOR managed projects, power plants and dams in Montana, for example: Hungry Horse Project, Yellowtail Power Plant and Tiber Dam. To prevent or manage AIS issues, the Environmental Applications and Research Group, along with its cooperators, have developed Integrated Pest Management techniques for Reclamation facilities. In Montana, BOR has a role in managing thousands of acres of water as part of recreation areas in partnership with the natural resource agencies of Montana. BOR provides funding to support Montana AIS efforts including funding inspection station operations and the construction of inspection and lodging facilities at Tiber Reservoir. BOR staff also actively survey for invasive mussels in BOR managed waters

The **National Park Service** (NPS) is tasked with the management of historic, cultural, and natural parks. The NPS has several parks, historic monuments and trails, battlefields, and recreation areas within the boundaries of Montana that are at risk from aquatic invasive species damage. Significant NPS managed areas in Montana include Glacier National Park and a portion of Yellowstone National Park, Big Horn Canyon Recreation Area, Lewis and Clark National Historic Trail and Little Big Horn Battlefield National Monument. The National Park Service is guided by their Management Policies document

(2006) to address exotic species with the development of management and control strategies. Each NPS managed area has differing programs related to aquatic invasive species that reflect the diversity of the landscape and current leadership. Specifically, Glacier National Park currently conducts early detection monitoring for AIS, conducts watercraft inspections and delivers an AIS outreach program. Yellowstone National Park conducts on-going research on a variety of aquatic invasive species, an active eradication program to control invasive fish species, and a recreational boat inspection program.

The **U.S. Army Corps of Engineers** (USACE) is tasked with the development, control, maintenance, and conservation the nation's water resources in accordance with the laws and policies established by Congress and the Administration. The USACE operates Libby Dam at Lake Koocanusa, and Fort Peck Project in Montana. The USACE Zebra Mussel Research Program (ZMRP) was authorized by the Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990, Public Law 101-646, and is the only federally authorized research program for the development of technology to control zebra mussels. The USACE Research and Development Center is currently tasked with investigating environmental DNA regarding the control of Asian carp in the Great Lakes. USACE provides AIS funding through Water Resource and Development Act (WRDA) Aquatic Plan Control – Watercraft Inspection and Decontamination (APC-WID) funding, supporting watercraft inspection and early detection monitoring. USACE actively samples for AIS in USACE managed waters.

The **U.S. Coast Guard** (USCG) receives authority to regulate ballast water and AIS from NANPCA and NISA. NANPCA directed the Coast Guard to issue regulations and guidelines to control the introduction and spread of ANS in the Great Lakes ecosystem. It also required an assessment of ballast water management practices in all U.S. ports.

The **U.S. Customs and Border Protection** (CBP) is tasked with securing the nation from the threats that we face, including protecting our borders, and conducting border inspections. Across the northern border of Montana, CBP conducts inspections on vehicles and watercraft suspected of carrying aquatic invasive species.

The **U.S. Department of Agriculture Animal and Plant Health Inspection Service** (APHIS) implements emergency protocols and partners with affected states to quickly manage or eradicate outbreaks, which may include aquatic invasive species.

The **U.S. Department of Agriculture Forest Service** (USFS) is guided by an internal management policy on aquatic invasive species and partners with FWP to address specific species issues. The USFS uses multiple authorities to manage aquatic and terrestrial invasive species (including vertebrates, invertebrates, plants, and pathogens), derived from laws enacted by Congress that authorize the Secretary of Agriculture to administer the agency and other resources and to issue necessary regulations. Many of these authorities have subsequently been delegated from the Secretary to the Chief of the USFS. The USFS invasive species activities are guided by the agency's National Strategy and Implementation Plan for Invasive Species Management (2004) and other associated policies and program plans. The USFS uses its authorities and broad base of expertise to conduct activities to prevent, detect, control, mitigate, and research aquatic and terrestrial invasive species across a wide

variety of landscapes and agency programs, including Forest Service Research and Development, State and Private Forestry, International Programs, and the National Forest System. The USFS emphasizes an integrated pest management approach against aquatic and terrestrial invasive species, utilizing a science-based structured decision-making process to prioritize activities across landscapes, and incorporates invasive species management considerations into Forest Land and Resource Management Planning efforts nationwide. The USFS provides technical and financial support to states and local organizations to address complex invasive species problems and establish cooperative partnerships against aquatic and terrestrial invasive species. Additionally, western regions of the USFS have adopted a variety of protocols to address minimizing the transport of AIS in wildland fire fighting activities.

The **U.S. Fish and Wildlife Service** (FWS) is the agency that provides federal cost-share funding for implementation of state and regional ANS management plans which have been approved by the ANSTF. The U.S. Fish and Wildlife Service's Aquatic Invasive Species Program is housed within the Fisheries and Habitat Conservation Program's Division of Fisheries and Aquatic Resource Conservation. The Branch of Aquatic Invasive Species essentially houses three functions:

- I. The FWS Aquatic Invasive Species Program seeks to prevent the introduction and spread of AIS, rapidly respond to new invasions, monitor the distribution of and control established invaders, and foster responsible conservation behaviors through its national public awareness campaigns, Stop Aquatic Hitchhikers and Habitattitude.*
- II. Administration of Aquatic Nuisance Species Task Force. The Branch of AIS builds capacity, coordinates, and implements AIS prevention and control activities authorized under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (as amended by the National Invasive Species Act of 1996), including co-chairing and administering the ANSTF, supporting regional panels of the ANSTF, providing grants for State/Interstate ANS Management Plans, and implementing a national AIS program.*
- III. Injurious Wildlife Evaluations and Listings. The AIS Program supports the Injurious Wildlife Provisions of the Lacey Act through an ongoing process of evaluating species and possibly listing them as injurious through the rulemaking process.*

The AIS Program has worked to prevent populations of invasive species from entering or spreading into the United States. Priority containment, early detection and rapid response, interjurisdictional coordination and planning, and regulatory and non-regulatory actions have occurred across many jurisdictions. Through the actions of the AIS program, a national AIS network has been built that has planned, directed, and accomplished significant regional and landscape level invasive species prevention and management resource outcomes. The AIS Program serves as the nation's front line for prevention of new aquatic invasive species by regulating imports of injurious wildlife, facilitating behavioral change, and managing pathways to limit the introduction and spread of invasives, and developing monitoring programs for invasion hotspots to facilitate early detection and rapid response. FWS provides funding through State ANS Plan grants that are used to support the FWP AIS lab and early detection efforts.

The **Aquatic Nuisance Species Task Force** (ANSTF) is an intergovernmental organization dedicated to preventing and controlling aquatic nuisance species and implementing the NANPCA of 1990. The

Montana Aquatic Invasive Species Management Plan

various NANPCA mandates were expanded later with the passage of the NISA in 1996. The Task Force coordinates governmental efforts dealing with AIS in the U.S. with those of the private sector and other North American interests via regional panels, issue specific committees and work groups.

Under NANPCA, state governors are authorized to submit comprehensive management plans to the ANSTF for approval which identify areas or activities where technical and financial assistance is needed. Grants are authorized to states for implementing approved management plans, with a maximum federal share of 75% of the cost of each comprehensive management plan. The state (or private) contribution is 25% of total program costs. Further, the ANSTF reviews and approves all revisions to the Montana Aquatic Invasive Species Management Plan.

Appendix E. Interagency MOU on AIS Management

Montana Department of Agriculture, Montana Fish Wildlife & Parks, Montana Department of Natural Resources and Conservation, and Montana Department of Transportation Aquatic Invasive Species Act Cooperative Agreement, 2024 to 2028

Aquatic invasive species (AIS) have the potential to damage the economy, environment, recreational opportunities, cultural resources, and human health of Montana. The Montana Aquatic Invasive Species Act (Act) was passed by the 2009 Montana Legislature and was revised in the 2011, 2017, 2019, 2021 and 2023 legislative sessions (MCA 80-7). Montana must take concerted actions to prevent, detect, control, and manage AIS. The best strategy for preventing the introduction, importation, and infestation of invasive species is through coordinated education, prevention, detection, and management activities. The Montana Aquatic Invasive Species Act recognizes that the Departments of Agriculture (MDA); Fish, Wildlife & Parks (FWP); Natural Resources and Conservation (DNRC), and Transportation (MDT); share concerns and responsibilities over AIS and seeks to provide collaboration between these state agencies whenever possible (MCA 80-7-1005). MDA, FWP, DNRC, and MDT are referred to collectively in this agreement as “the Departments.”

The Act supports and enhances AIS efforts for the departments and seeks to ensure coordination of agency roles/responsibilities when there may be overlapping jurisdiction. The Act recognizes that the Departments may share concerns and responsibilities over some aquatic invasive species and seeks to provide collaboration and coordination among them whenever possible. Defined roles and responsibilities provides direction to the Departments for addressing AIS issues, which results in improved efficiency, reduced redundancy, and clarity to partners and the public. To achieve this objective, the Act directs the Departments to develop cooperative agreements that further clarify agency roles and responsibilities if there are questions about which agency has lead jurisdiction or when there is overlapping interest in a specific AIS. Cooperative agreements may also be used to transfer funding among the Departments for implementing AIS priority activities with funding authorized through the Act.

PURPOSE and GOALS:

The primary purpose of this agreement is to establish the cooperative agreement required at 80-7-1006(2) MCA to, “... clarify and coordinate their respective responsibilities” to prevent, detect, and manage AIS. It also serves as a mechanism for the Departments to transfer financial resources from one Department to another.

This agreement clarifies each Department’s specific responsibility(s) and role(s) relative to the management of AIS in Montana, to communicate those responsibilities to other interested agencies, organizations, and the public and to use limited funding for maximum effectiveness. This agreement also clarifies how the Act fits into the existing authorities of the Departments.

The Departments seek to:

- Enhance the Department cooperation;
- Improve efficiency and consistency;
- Increase public, industry, and other government agency awareness and participation;
- Increase coordination with the public, stakeholders, bordering states, and provinces;
- Increase speed and availability of data and information sharing among the Departments and other agencies;
- Seek and distribute funding to support priority AIS efforts;

Montana Aquatic Invasive Species Management Plan

- Collaborate to prevent the introduction and spread of AIS;
- Establish an AIS interagency working group to be convened, as needed, to coordinate AIS prevention, detection, and management efforts between Departments;
- Collaborate on emergency responses including requests for a declaration of an AIS emergency from the Governor.
- Coordinate on AIS program reporting and outreach efforts.

REGULATORY AUTHORITIES:

While each department will use its existing authority and jurisdiction to address issues, each department recognizes that other departments and agencies beyond this agreement may also have interests, concerns, and roles or responsibilities.

FWP Authorities:

FWP directs and houses the AIS Bureau and has the lead authority over invasive aquatic animals, aquatic animal pathogens, and aquatic plants. FWP is tasked with all aspects associated with aquatic invasive species and is responsible for implementing the Montana Aquatic Nuisance Species Management Plan (ANS Plan). This plan outlines six objectives including:

1. Coordinate and implement the Comprehensive Management Plan;
2. Prevent the introduction of AIS into Montana (watercraft inspection);
3. Detect, monitor and eradicate pioneering AIS (survey);
4. Where feasible, control and eradicate established AIS that have significant impacts (treat);
5. Inform public, policy makers, natural resource workers, private industry and user groups about the risks and impacts of AIS (education);
6. Increase and disseminate knowledge of AIS in Montana through compiling data and conducting research.

To support the Plan objectives, FWP leads statewide watercraft inspection station operations, early detection surveys, and the development and delivery of outreach programs. FWP also serves on the Montana Invasive Species Council (MISC), is a non-voting member of the Western Montana Conservation Commission (WMCC), and coordinates with both on AIS issues and initiatives. FWP also represents Montana on the Western Regional Panel of the Aquatic Nuisance Species Taskforce and the Columbia and Missouri River Basin Teams.

MDA Authorities:

MDA, along with the Counties, has authority over all state and county-listed noxious weeds. MDA houses the Noxious Weed Program within the Agriculture Sciences Division, with responsibilities for listed noxious weeds. The MDA is a resource and an advisor to the AIS interagency working group and serves on MISC. MDA may provide grants through the Noxious Weed Trust Fund Grant for aquatic listed noxious weeds if no other funding source is available. The County Weed Districts have authority to manage noxious weeds at the local level. MDA also has the authority to regulate all pesticides and pesticide applicators, including aquatic pesticides.

Montana Aquatic Invasive Species Management Plan

MDT Authorities:

MDT cooperates with the agencies to utilize MDT facilities as locations for AIS inspection stations. MDT also helps facilitate the safe and effective implementation of AIS inspection stations, proper use of signage at non-MDT facilities, and accommodates on-site storage of inspection station equipment, where possible. MDT also provides information regarding any commercial motor vehicle carrying marine equipment fouled with AIS. MDT includes special permit conditions for commercial motor vehicles carrying oversized marine vessels and equipment.

DNRC Authorities:

DNRC has authority over certain public lands and the water resources of the state. Its authority relative to AIS occurs through two of its administratively attached agencies, The Montana Invasive Species Council (MISC, 2-15-3309 MCA), and the Western Montana Conservation Commission (WMCC, 2-15-3311 MCA).

The statutory purpose of MISC is, "...to advise the governor on a science-based, comprehensive program to identify, prevent, eliminate, reduce, and mitigate invasive species in Montana and to coordinate with public and private partners to develop and implement statewide invasive species strategic plans." The Directors (or their designee) for of all parties to this MOU are statutory members of MISC.

The Statutory purpose of WMCC is, "...The purpose of the western Montana conservation commission is to protect the existing high quality of western Montana's aquatic resources.) Within the Western Conservation Commission Act, Aquatic Resources are defined, "'Aquatic resources' means all beneficial uses of water, including but not limited to water quality and water supply; recreational, scenic, and aesthetic values; and fish, wildlife, and other organisms, including the prevention and management of aquatic invasive species." The Directors (or their designee) for of all parties to this MOU are statutory, non-voting members of WMCC, except for the Director of the Department of Agriculture.

JOINT DEPARTMENTAL COMMITMENTS:

Montana Aquatic Nuisance Species Management Plan

FWP has prepared an executive level ANS Management Plan, which includes prevention, early detection, control, education, and emergency response. The existing ANS Plan is currently being revised by FWP, with input from all the Departments to prepare a revised plan that is in alignment with the current statute and the Montana Invasive Species Framework.

Participation on the Montana Invasive Species Council

The Departments agree to actively participate on MISC and provide information, updates, notification of detections, and other resources.

Participation on the Western Montana Conservation Commission

As relevant and necessary, the Departments agree to actively participate in WMCC meetings and provide updates, notifications, and input.

Implementation of the Montana Invasive Species Framework

The Departments agree to lead and/or assist with (as appropriate for each task) the implementation of the Montana Invasive Species Framework as it relates to AIS and to report back to MISC on progress.

Invasive Species Notification

Each Department agrees to notify the Departments within three business days of the confirmation of a new AIS population within the jurisdiction of the other agencies. The primary representatives are the State Noxious Weed Coordinator at MDA, the AIS Bureau Chief at FWP, the Invasive Species Program Managers at the DNRC, and the Maintenance Weed Coordinator at MDT. The Departments will treat the notification as preliminary and confidential until otherwise notified that the information may be released. FWP has primary jurisdiction related to species identification and population verification. FWP will lead public notification and dissemination of information on any new AIS detection.

Public Education and Awareness

The Departments jointly develop and implement invasive species public education and awareness strategies. The FWP AIS Program in coordination with the FWP Communications and Education Division, serves as the lead for development and implementation of AIS-related public awareness campaigns. Public education and awareness is an on-going element of AIS and the Departments shall meet periodically to coordinate current and future needs and modify the strategy as needed.

Aquatic Invasive Species List(s)

The Departments maintain lists of AIS and their priority classes (if applicable) within their jurisdiction and identify other departments and other public agencies with overlapping jurisdiction or interests in each species. These lists will be shared whenever updated or changed. See Appendix A for list of species.

Invasive Species Management Areas

There are established statewide invasive species management areas for the purpose of preventing the introduction, importation, and infestation of AIS.

Invasive Species Data Management

The Departments agree to share data pertaining to AIS and coordinate on consistent protocols and reporting mechanisms. AIS survey and distribution data will be provided to the Montana Natural Heritage Program annually.

FWP ADDITIONAL COMMITMENTS:

- Provide statewide, regional, and national leadership and coordination for Montana on AIS issues in coordination with the Departments.
- Provide facilitation among the Departments on AIS-related issues.

Montana Aquatic Invasive Species Management Plan

- Coordinate AIS-related outreach and stakeholder engagement.
- Develop and implement a statewide early detection and surveillance monitoring plan for quagga/zebra mussels and other AIS in coordination with Departments and partners.
- Continue to operate the AIS laboratory for early detection sample analysis.
- Conduct mandatory boat inspections at high-risk state border locations, Continental Divide locations, and at other high priority areas to prevent the movement of AIS and to educate the public about the threat posed by AIS.
- Coordinate and expand partner involvement with watercraft inspection, AIS early detection monitoring, and AIS outreach efforts.
- Continue to implement the Montana ANS Management Plan. FWP will lead the preparation and coordination of plan updates and annual progress reports. Annual progress reports will be prepared, disseminated, and made available to the general public and to local, state, and federal decision makers.
- Revise and update the ANS Plan in 2024 in collaboration with MDA, MDT, DNRC, and other state, federal, tribal, and local agencies and interested parties.
- Expand targeted outreach to pet stores and ornamental pond retailers to address AIS transport and introduction.
- Provide statewide, regional, and national coordination for Montana on invasive aquatic plants and invertebrates prevention, early detection, and outreach activities.
- Serve as the aquatic plant and invertebrate lead for state agencies, conservation districts, tribes, county weed districts, and other partners.

MDA ADDITIONAL COMMITMENTS:

- Provide statewide, regional, and national coordination for Montana on noxious weeds. Coordination will be through the designated MDA representative.
- Coordinate with county weed districts and other partners to provide updated information and data on invasive aquatic plant issues as they arise.
- Coordinate and meet with other departments, agencies, organizations, and other interested parties to facilitate communication, public input, and information exchange.
- Conduct education and awareness outreach on invasive species to groups traditionally associated with MDA, including irrigators, nurseries, and agriculture-based organizations.
- Share information related to travel, public outreach, and planned invasive species activities.
- Provide expertise and guidance for pesticide use for AIS treatments.

MDT ADDITIONAL COMMITMENTS:

- Cooperate with the Departments to utilize MDT facilities as locations for AIS inspection stations.
- As requested, help identify locations for AIS inspection stations along MDT state-maintained highways.
- Provide guidance and direction for the proper use of traffic control signage and invasive species signage following the Manual on Uniform Traffic Control Devices (MUTCD). When requested by FWP, MDT will install permanent traffic control signs for AIS inspection stations along state-maintained highways.

Montana Aquatic Invasive Species Management Plan

- Identify and report any commercial motor vehicle carrying marine equipment fouled with aquatic invasive species. MDT has special permit conditions for commercial motor vehicles carrying oversized marine vessels and equipment.

DNRC ADDITIONAL COMMITMENTS:

- As directed by MISC and WMCC, provide policy-level guidance, planning, and coordination for invasive species-related issues.
- Continue supporting local efforts to address AIS issues through the AIS Grant Program and other grants and contracts, as funding is available.
- Provide staff to support MISC and the WMCC.
- Ensure coordination and collaboration between MISC, WMCC, and the Departments.
- Participate in AIS activities and assist with AIS efforts as needed.
- Support AIS education and outreach efforts and strategies.

PROJECTS (2024-2028)

- Continued implementation of the Montana Invasive Species Framework through the ongoing efforts of MISC.
- With FWP as the lead, the Departments will collaborate on the revision of the Montana Aquatic Nuisance Species Management Plan based on statute, rule, and the Montana Invasive Species Framework.
- With FWP as the lead, the Departments will continue to update, refine, and test (via rapid response exercises) the Montana Dreissenid Rapid Response Guidelines.
- The Departments will coordinate to expand partner involvement in watercraft inspection, early detection, and AIS outreach.
- Through WMCC, continue to focus on AIS coordination and communication between stakeholders in the Montana portion of the Columbia River watershed.
- Through MISC, continue to explore the implementation of recommendations from the Invasive Species Law Review and white papers that identify gaps and needs in AIS law and rule.
- Through MISC, continue to explore AIS topics that would benefit from a scientific advisory panel evaluation or review.
- Through DNRC and MISC, continue to enable and support AIS projects through the AIS Grant Program.
- The Departments will continue to coordinate the delivery of AIS outreach information throughout Montana.
- The Departments shall meet annually to coordinate AIS strategies, activities, and initiatives. The Departments will evaluate operations and activities and identify strategies to improve efficacy, efficiency, and reduce redundancy.

TERMS OF COOPERATIVE AGREEMENT:

This cooperative agreement shall be effective upon the last signature date. This agreement may be modified only in writing by mutual agreement of all department directors. This agreement will remain in effect through December 30, 2028, unless terminated in writing by signature of any department director.

Signature Approvals:

Director, Montana Department of Agriculture

Date

Director, Montana Fish, Wildlife & Parks

Date

Director, Montana Department of Natural Resources and Conservation Date

Director, Montana Department of Transportation

Date

Appendix F. Montana AIS Laws, Rules and Statues

The full language of each AIS law, rule and statue are housed online in multiple places.

<http://www.mtrules.org/>

http://leg.mt.gov/bills/mca_toc/index.htm

At the time of this document completion, the following laws, rules and statues relevant to AIS programming, and jurisdiction were in effect.

<i>Montana Fish Health and Import Statutes</i>	[87-3-209 through 87-3-227 MCA]
<i>Montana Fish Health and Import Administrative Rules</i>	[12.7.501 through 12.7.507 ARM]
<i>Montana Importation, Introduction, and Transportation of Wildlife Statutes</i>	[87-5-701 through 87-5-725 MCA]
<i>Montana Importation, Introduction, and Transportation of Wildlife Administrative Rules</i>	[12.6.2201, 2003-2205, 2208, 2210, 2211, 2215, 2220, 2225, 2230]
<i>Aquatic Invasive Species Inspection Stations Rule</i>	[Administrative Rule 12.11.341 ARM]
<i>Permit Required for Importation of Leeches</i>	[Administrative Rule 12.7.540 through 12.7.542]
<i>Montana Pesticides Act</i>	[80-8-101 through 80-8-405 MCA]
<i>Montana Disease, Pest, and Weed Control Act - Control of Diseases and Insects in Nurseries</i>	[80-7-101 through 80-7-135 MCA]
<i>Montana Quarantine and Pest Management Act</i>	[80-7-401 through 80-7-404 MCA]
<i>Montana Weed Control Act</i>	[80-7-701 through 80-7-720 MCA]
<i>Eurasian Watermilfoil Management Area</i>	[Administrative Rule 4.12.3901]
<i>Reclamation and Development Grants Programs</i>	[90-2-1101 through 90-2-1121 MCA]