US Army Corps
of Engineers
Omaha District

INTEGRATED LETTER REPORT AND PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

Federal Participation in Watercraft Inspection Stations Upper Missouri River Basin

Source: South Dakota Game, Fish and Parks

Prepared in response to Section 104 of the River and Harbor Act of 1958, as amended by Section 1039(d) of the Water Resources Reform and Development Act of 2014, Section 1178 of the Water Infrastructure Improvements for the Nation Act of 2016, Section 1170 of the Water Resources Development Act of 2018, and Section 505 of the Water Resources Development Act of 2020.

June 2023

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EXECUTIVE SUMMARY

This Integrated Letter Report and Programmatic Environmental Assessment presents the results of economic and environmental impact evaluations performed to determine if the federal government should participate in an ongoing state-managed program to prevent and control the spread of aquatic invasive species (AIS) in the Upper Missouri River Basin (UMRB). The UMRB has a relatively low infestation of invasive zebra or quagga mussels (referred to as dreissenids) compared to waters east of the Mississippi River, and therefore federal participation in state-managed programs represents an excellent opportunity to further work to prevent the spread of dreissenids into and among waters of the UMRB.

The UMRB is at high risk of a dreissenid infestation due to the mobility of watercraft transported between and within watersheds over interstate highways and other highways. In addition, the high survival rate of dreissenids once established, their ability to be hidden on or inside of boats and other structures, and the high financial and environmental costs of infestation present serious problems to those who live, work, or recreate in the UMRB.

The existing watercraft inspection efforts are coordinated collaboratively by the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska, where watercraft transported along highways are inspected for the presence of dreissenids and other aquatic invasive species (AIS) and decontaminated when AIS are detected. If approved, the program would be cost shared at 50 percent with each state, and eligible activities would include: the establishment and operation of watercraft inspection stations, monitoring programs, contingency planning, and rapid response planning and preparation which would provide the greatest likelihood of preventing the spread of AIS into or out of waters of the U.S. within the UMRB.

A wide range of measures to augment and improve the effectiveness and efficiency of the program was considered. These measures include USACE participation in the regional coordination efforts, expanding the number of locations or hours of operation, adding canine detection capabilities, increasing public awareness, constructing site improvements, as well as augmenting existing monitoring efforts and contingency and response planning efforts. After formulation of alternatives and screening, Alternative 2, Comprehensive Adaptive Improvements, was identified as the Recommended Alternative. This Recommended Alternative would augment the existing watercraft inspection program by incorporating a comprehensive range of measures that would function as a suite of tools that would be applied and adjusted annually by each state based on its need and ability to fund its portion of the program, the results of the regional coordination efforts, and the availability of federal funding.

The study period length is 50 years. While the goal of the watercraft inspections in the basin is to prevent the infestation of dreissenids entirely, there is a possibility that it only prevents an infestation for a few years from the project's inception. To account for these uncertainties and risks, economic modeling was performed assuming different years of future onset. For the final total benefit figure, it was assumed that the

watercraft inspections could stave off a dreissenid infestation for at least 25 years from the project's inception. Conservative estimates of the average annual operations and maintenance cost savings associated with deferring an infestation for 25 years is approximately $81,600,000. Estimated average annual costs of the inspection station program over 25 years is approximately $7,250,000, based on the most likely projected outcome, resulting in a benefit-cost ratio of about 11.25 to 1. These economic benefits do not include the ecosystem benefits associated with delaying an infestation.

Because federal participation would augment an existing state-managed program that is operated primarily along developed portions of major highways, there are only minimal direct effects to the environment. The indirect environmental effects of the proposed action are beneficial. Based on limited scope and effects and the coordination performed for the study, no controversy is anticipated. Because the program has such a limited initial investment and scope, and can be terminated at any time, there is extremely low residual risk.

INTEGRATED LETTER REPORT AND PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FEDERAL PARTICIPATION IN WATERCRAFT INSPECTION STATIONS UPPER MISSOURI RIVER BASIN

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ACRONYMS AND ABBREVIATIONS

AIS	aquatic invasive species
ANSTF	Aquatic Nuisance Species Task Force
BCR	benefit-to-cost ratio
BGEPA	Bald Eagle and Golden Eagle Protection Act
BPA	Bonneville Power Administration
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Policy Act
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
HQ	Headquarters (USACE)
IEAB	Independent Economic Analysis Board
IPCC	Intergovernmental Panel on Climate Change
LR/Programmatic EA	Letter Report/Programmatic Environmental Assessment
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRA	National Recreation Area
NWPCC	Northwest Power and Conservation Council
NWD	Northwestern Division
NWW	Walla Walla District
NOAA	National Oceanic and Atmospheric Administration
O&M	operation and maintenance
PL	Public Law
PNWER	Pacific Northwest Economic Region
PSMFC	Pacific States Marine Fisheries Commission
Reclamation	U.S. Bureau of Reclamation
RHA	River and Harbor Act
SHPO	State Historic Preservation Officer
System	Regional Watercraft Inspection and Decontamination Data Sharing System
UMRB	Upper Missouri River Basin
UMRB RR Plan	Upper Missouri River Basin Interagency Invasive Species Response Plan: Zebra Mussels and Other Dreissenid Species
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture

USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WID	watercraft inspection and decontamination
WISCE	Western Invasive Species Coordination Effort
WRDA	Water Resources Development Act
WRP	Western Regional Panel on Aquatic Invasive Species

SECTION 1 - INTRODUCTION

This Integrated Letter Report and Programmatic Environmental Assessment (LR/Programmatic EA) presents the results of U.S. Army Corps of Engineers (USACE) evaluations of potential and anticipated consequences of a proposed federal action to engage in several techniques to help prevent the spread of aquatic invasive species (AIS) into and out of the Upper Missouri River Basin (UMRB). The proposed action calls for USACE participation in a cost-shared effort to coordinate the establishment of new or bolster existing watercraft inspection stations maintained and operated by non-federal sponsors in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska to help reduce the risks associated with infestations of aquatic invasive species (AIS) at USACE reservoirs and waters of the U.S. within the Upper Missouri River Basin (UMRB). This report documents the environmental, planning, and economic considerations used to develop and support the concluding recommendations. It also documents the coordination and evaluations performed for the proposed federal action to comply with Title 33 Code of Federal Regulations (CFR) Part 230, Procedures for Implementing the National Environmental Policy Act (NEPA) (USACE 1988), and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, Title 40 CFR Part 1500-1508, updated May 20, 2022.

NEPA is a full disclosure law that provides opportunity for public involvement in the federal decision-making process. All persons and organizations that have a potential interest in this proposed action—including the public, other federal agencies, state and local agencies, Native American Tribes, and interested stakeholders—are encouraged to participate in the NEPA process. The programmatic scope of this LR/Programmatic EA allows necessary minor changes in the proposed action to be implemented in response to changing physical and environmental conditions and changes in state and federal laws over time, including changes to program authorities.

This LR/Programmatic EA includes an evaluation of potential environmental effects of the proposed establishment of watercraft inspection stations throughout the UMRB at locations with the highest likelihood of preventing the spread of AIS into or out of waters of the U.S. within the basin. If such effects are less than significant, a Finding of No Significant Impact (FONSI) will be issued, and the USACE will proceed with the proposed federal program. If the environmental effects are determined to be significant, an Environmental Impact Statement (EIS) will be prepared before a decision is reached on whether to implement the program.

1.1 AUTHORITY AND GUIDANCE

This report was prepared pursuant to Section 104 of the River and Harbor Act (RHA) of 1958 (33 USC § 610), as amended by Section 1039(d) of the Water Resources Reform and Development Act (WRRDA) of 2014 (Public Law (PL) 113-121), Section 1178(b) of the Water Infrastructure Improvements for the Nation Act of 2016 (Public Law 114-322),

Section 1170 of the Water Resources Development Act (WRDA) of 2018 (PL 115-270), and Section 505 of WRDA of 2020 (PL 116-260).

Section 104 authorized a comprehensive program to provide for prevention, control, and progressive eradication of noxious aquatic plant growths and aquatic invasive species from the navigable waters, tributary streams, connecting channels, and other allied waters of the United States, in the combined interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health, and related purposes, including continued research for development of the most effective and economic control measures, to be administered by the Chief of Engineers, under the direction of the Secretary of the Army. The authorization includes required consultation and coordination with Tribes, states, and other federal agencies. In carrying out Section 104, the Secretary shall establish (as applicable), operate, and maintain new or existing watercraft inspection and decontamination stations at locations that have the highest likelihood of preventing the spread of aquatic invasive species into and out of Water of the United States, which will be cost shared with the nonfederal sponsors at 50 percent. Section 104 also authorizes the program to cost share activities such as rapid response, monitoring and contingency planning.

WRRDA 2014 authorized USACE to cost-share watercraft inspections stations within the Columbia River Basin. USACE Headquarters provided guidance (USACE, HQ 2016) to undertake an evaluation to determine the locations for establishing watercraft inspection stations for the basin. The guidance required documentation in the form of a letter report and an appropriate NEPA document, and outlined eight specific content requirements. Table 1 lists the eight requirements and the sections in which they are addressed in this document.

WRDA 2016 further amended the authorization and in March 2017, USACE Headquarters provided updated implementation guidance (USACE, HQ 2017). The guidance removed the within-river basin protection requirements and authorized actions to occur anywhere in a state where the river basin is located, as long as it provides protection to the authorized river basin. The guidance also provided direction to assist these states in rapid response planning, preparation, and response.

WRDA 2018 further amended the RHA by authorizing the addition of the Upper Missouri River, Upper Colorado River, and South Platte River Basins. The Assistant Secretary of the Army (Civil Works) issued Implementation Guidance for WRDA 2018 on April 12, 2019, that directed USACE to use previous implementation guidance from 2016 and 2017 for the newly added basins.

WRDA 2020 amended Section 104 of the RHA to replace the incorrect reference to the Arizona River Basin with the Arkansas River Basin. It also changed the location criteria for inspection stations from those that prevented the spread of AIS at reservoirs operated and maintained by USACE, to “locations with the highest likely of preventing the spread of aquatic invasive species into or out of waters of the United States”

Table 1. Water Resources Reform and Development Act of 2014 Implementation Guidance Requirements (USACE, HQ 2016) and Location in Document

Guidance Requirements	Location Addressed in Document
1) Analysis of problems, needs, and opportunities in the affected area related to spread of AIS.	Section 3.1
2) Cost and impact information of invasive species on USACE projects and facilities.	Section 3.1 and 4.1.2.1
3) Locations of existing watercraft inspection stations operated by others.	Section 2.2.2
4) Identification of locations for establishing new watercraft inspection stations with the highest likelihood of preventing the spread of AIS into or out of waters of the U.S.	Section 2.2.2, 3.4 and 9.1
5) Analysis on cost effectiveness, engineering feasibility, and environmental acceptability.	Sections 4.1 and 4.3 (cost effectiveness);
6) Lifecycle costs associated with any proposed watercraft stations.	Section 2.2.6 (Due to the simplicity of watercraft inspection stations, life cycle costs are minimal.)
7) Delineation of Federal and non-Federal roles and responsibilities, including real estate requirements.	Section 10
8) Recommendations on further action, including those that may require additional authorization to implement.	Section 9

1.2 STUDY AREA

The location of the proposed action (as defined by the legislative authority) is within the UMRB in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska (sometimes referred to as the study area states throughout the report). The UMRB is illustrated in Figure 1.

The UMRB study area encompasses the drainage of approximately 352,173 square miles (912,124 kilometers^2) of the eastern flank of the Rocky Mountain front range and Great Plains, comprising portions of Montana, Wyoming, North Dakota, South Dakota, and Nebraska (Figure 1). The Upper Missouri River originates at the Continental Divide in western Montana and flows in an east-southeast direction over approximately 1,750 miles to near Omaha, Nebraska, and the confluence with one of its major tributaries, the Platte River. The UMRB is generally sparsely populated and dominated by agricultural industry and infrastructure. The largest city is Omaha, Nebraska, with a population estimated at approximately 475,000. Other major cities include Sioux Falls, South

Dakota (population 190,000); Bismarck, North Dakota (population 73,500); and Great Falls, Montana (population 58,500). Significant tributaries to the Upper Missouri River within the UMRB include the Yellowstone River; the Cheyenne River, draining parts of the South Dakota and Wyoming Badlands region; and the Niobrara River, draining parts of the Sandhills region in South Dakota, Wyoming, and Nebraska.

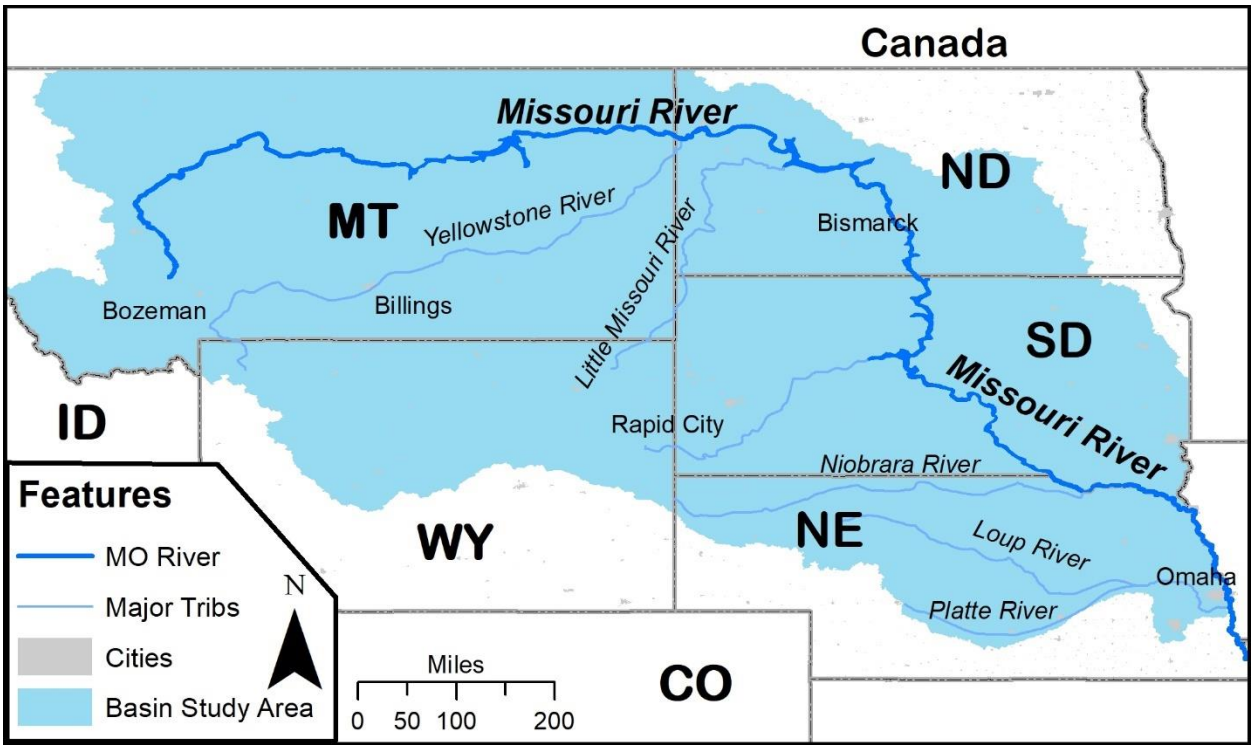

Figure 1. The Upper Missouri River Basin and State Boundaries

1.3 KEY TERMINOLOGY

Definitions of key terms used throughout this report are provided below.

Aquatic Invasive Species

An "invasive species" is defined with regard to a particular ecosystem, as a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health (Executive Order (EO) 13751, Safeguarding the Nation from the Impacts of Invasive Species, December 5, 2016). AIS are invasive species that inhabit the aquatic environment.

Dreissenid

Currently, the AIS of particular concern in the UMRB are zebra (*Dreissena polymorpha)* and quagga mussels (*Dreissena rostriformis bugensis)*, which are freshwater mussels from the family Dreissenidae. Collectively, they are called dreissenids.

Due to the growing concern of a dreissenid infestation in the UMRB, the focus of this LR/Programmatic EA is on dreissenids. However, methods used for preventing the spread of dreissenids are also effective for other types of AIS, such as flowering rush *(Butomus umbellatus),* Eurasian watermilfoil *(Myriophyllum spicatum)*, and curlyleaf pondweed *(Potamogeton crispus)*.

The term "dreissenids" is used throughout this document, unless the idea of AIS in general, or plant AIS is intended. In instances where information came from an outside source, the term mussel, zebra mussel, or quagga mussel was used, as applicable. Statements that pertain to a particular dreissenid species may or may not apply to the other species.

Establishing a Watercraft Inspection Station

Establishing a watercraft inspection station means to select and prepare the site, to provide and/or mobilize the equipment and materials needed to perform watercraft inspection activities, and to construct facilities, as needed.

Facility Vulnerability Assessments

Facility vulnerability assessments are performed to determine the components of a hydropower facility that would be affected in the event of a dreissenid infestation and how the function of those components would be affected (DeBruyckere and Phillips 2015).

Maintaining a Watercraft Inspection Station

Maintaining a watercraft inspection station means to perform routine and annual equipment and facility maintenance required for the hot water pressure washers (wash unit), including winterization, changing the oil, and replacing tires, valves, thermostats, hoses, and fittings. It may include demobilizing the equipment and materials from the site and placing equipment at storage facilities.

Operating a Watercraft Inspection Station

Operating a watercraft inspection station means to provide the manpower needed to set up and operate the station at a site for the duration of the season.

Regional Defense

Regional defense is defined as "using resources in a cost-effective, interjurisdictional, coordinated, and collaborative response to prevent mussels from entering uninfested areas and to contain aquatic invasive species at their source" (PNWER and PSMFC 2015).

Veliger

A veliger is the free-swimming larvae of freshwater mussels, including zebra and quagga mussels.

1.4 PURPOSE AND NEED FOR ACTION

The purpose of the proposed action is to assist the states of Montana, North Dakota, South Dakota, Nebraska, and Wyoming with establishing and operating watercraft inspection stations, monitoring, and rapid response planning efforts to aid in preventing the spread of AIS in to or out of Waters of the U.S. within the UMRB. The proposed action would be conducted in collaboration with regional partners as part of a larger, comprehensive defense strategy to protect water bodies in the UMRB, pursuant to Section 104 of the RHA 1958 (33 USC 610).

The proposed action is needed because the risk of the spread of AIS to Waters of the U.S. into and out of the UMRB is high, and the introduction and establishment of AIS (particularly dreissenids) has the potential to cause damage and increased operation and maintenance (O&M) costs to water-related infrastructure, recreation, and the ecosystem. Dreissenids present a direct threat to USACE authorized purposes including hydropower, navigation, and fish and wildlife mitigation. Once a waterway is infested, dreissenids can reproduce rapidly and spread.

SECTION 2 - BACKGROUND

As stated in Section 1, the main AIS of concern in the UMRB at this time are zebra and quagga mussels (Figure 2), which are also known as dreissenids. Dreissenids are nonnative organisms that were first discovered in the Great Lakes in the late 1980s, and they quickly spread to the middle and northeastern United States. Since then, established populations have also been detected in California, Nevada, Utah, Colorado, and Arizona. According to the Pacific Northwest Economic Region (PNWER) and the Pacific States Marine Fisheries Commission (PSMFC) (2015), the Pacific Northwest is the only region without established populations of dreissenids. **Error! Reference source not found.** 3 illustrates how they are distributed throughout the United States as of 2019, including populations that were detected, but subsequently did not become established.

Figure 2. Zebra and Quagga Mussels
Source: PSMFC GIS Center

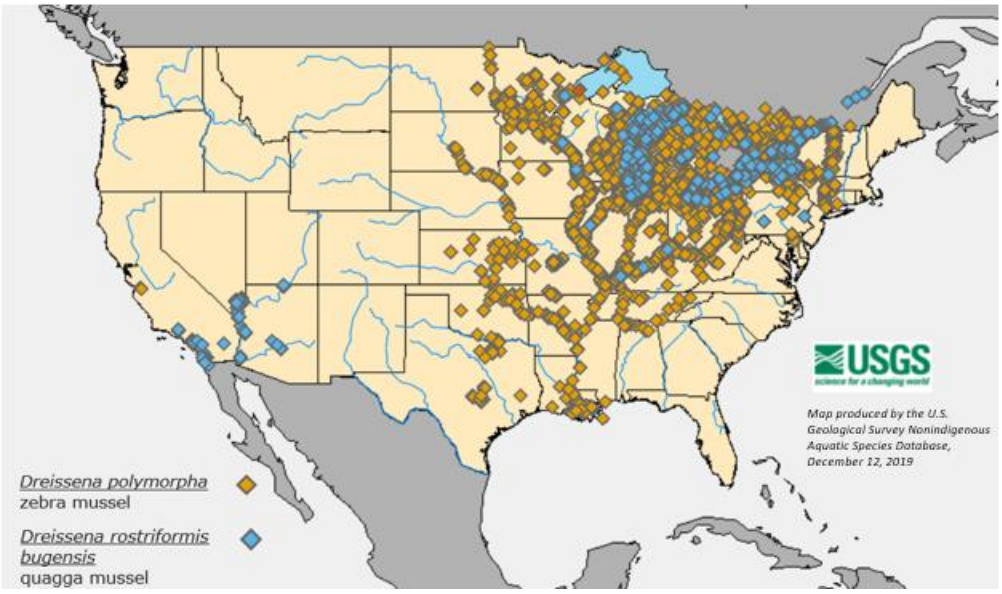

Figure 3. Established Dreissenid Populations in 2019
Source: USGS 2019

Dreissenids have few natural predators, so introduced populations grow unchecked. According to the Cary Institute of Ecosystem Studies (2020), dreissenids are highly prolific and attach themselves to boats or any hard surface with their byssus, or beard. They can live out of water for 2 weeks, and their larvae, known as veligers, use currents to colonize new waters. As many as 700,000 mussels can pile up in a square yard. Figure 4 and Figure 5 show examples of them attaching to a surface.

Figure 4. Adult Dreissenids Surface Attachment
Source: Earthtec 2015

Figure 5. Zebra Mussels Removed from Watercraft during Inspection and Decontamination at Lewis and Clark Lake, South Dakota
Source: South Dakota Game, Fish and Parks

An example of their ability to quickly colonize and rapidly achieve high densities is provided in Figure 6, which demonstrates the increase in quagga mussel densities in Lake Michigan over a 10-year period. Once established, they cause considerable impacts to the ecosystem and water-related infrastructure, as described in Section 3.1 of this report. The invasion of dreissenids has already generated extensive costs

related to infrastructure, biodiversity, and water quality in other regions of the United States.

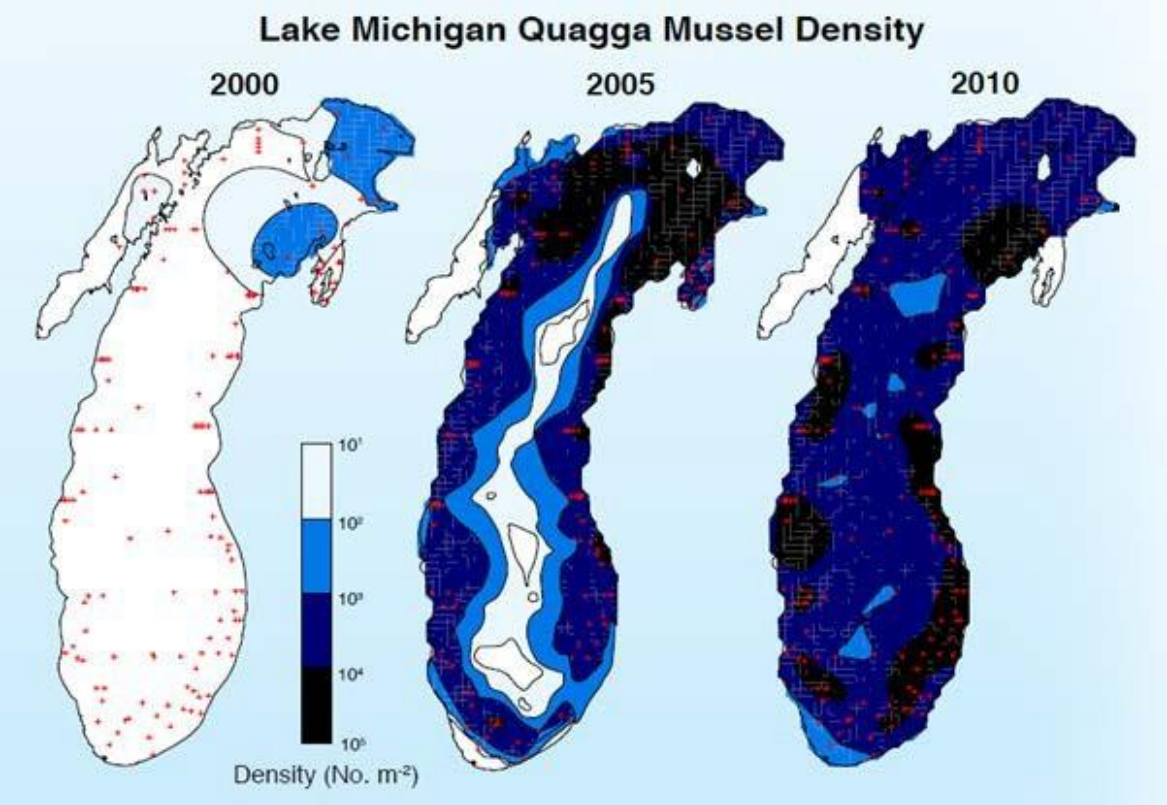

Figure 6. Quagga Mussel Density Lake Michigan 2000-2010
Source: NOAA Great Lakes Environmental Research Laboratory, n.d.

2.1 REGIONAL RESPONSE

The discovery of adult quagga mussels at Lake Mead, Nevada, in 2007, led many resource management agencies in the Western United States to initiate watercraft inspection and decontamination (WID) programs (Elwell and Phillips 2016). Since then, not only have watercraft inspection station programs expanded substantially, but state, federal, provincial, Tribal, local, and non-governmental organizations are engaged in regionally coordinated efforts in the defense against dreissenids throughout the West. Montana, Wyoming, North Dakota, South Dakota, and Nebraska, in cooperation with other states, coordinate efforts and make decisions as part of this regional strategy, while operating within the scope of their specific budgets and statutory authorities. Regional coordination occurs through collaboration with the AIS-prevention organizations described below.

Aquatic Nuisance Species Task Force

The Aquatic Nuisance Species Task Force (ANSTF) was established by the Nonindigenous Aquatic Nuisance Species Prevention and Control Act of 1990 (PL 101-636). The ANSTF is an interagency organization co-chaired by U.S. Fish and Wildlife

Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) (USFWS 2022). Activities of the ANSTF include aquatic nuisance species prevention, research, and control; public and stakeholder education; and state coordination efforts (USFWS 2022). The ANSTF works with six regional panels, including the Western, Great Lakes, Northeast, Mississippi River Basin, Mid-Atlantic, and Gulf and South Atlantic. The mission of the Western Regional Panel is "to protect western aquatic resources by preventing the introduction and spread of non-native invasive or nuisance species into western marine, estuarine, and freshwater systems" through coordination with state, Tribal, federal, and other entities (PNWER and PSMFC 2015).

The Stop Aquatic Hitchhikers! (stopaquatichitchhikers.org/) campaign was launched by the Aquatic Nuisance Species Task Force in 2002. It is designed to raise awareness about aquatic invasive species with the "Clean. Drain. Dry." message for recreational watercraft.

Western Regional Panel on Aquatic Nuisance Species

The Western Regional Panel on Aquatic Nuisance Species (WRP; westernregionalpanel.org) is one of six regional panels under the ANSTF that meets annually to address the spread of invasive species in the waters of the western United States. The WRP annual meeting brings together the public and private sector researchers, industry representatives, agency representatives, and legislators to discuss invasive species management in 19 Western States and four Canadian provinces. The meeting focuses on AIS research and development, including the most innovative and forward-thinking research in the region. WRP documents (westernregionalpanel.org/key-documents/) provide stakeholders with standardized training for conducting inspections and monitoring.

Regional coordination efforts by the WRP also include establishing protocols and standards, which are provided in a PSMFC document called Uniform Minimum Protocols and Standards for Watercraft Inspection and Decontamination Programs for Dreissenid Mussels in the Western United States III (Elwell and Phillips 2016). These protocols and standards are scientifically based and are intended to help provide consistency across watercraft inspection stations in the West. The five states in the study area aim to meet these standards and protocols commensurate with their budgets and authorities.

Aquatic Invasive Species Network

The (Western) Aquatic Invasive Species Network (AISN, https://www.westernais.org/) website, supported by the PSMFC, is collaborative source of information. It provides information on the efforts of states and provinces in the United States and Canada to prevent the introduction and spread of AIS. The network maintains links to a broad range of activities throughout western North America and around the world. The site complements information maintained by the WRP and other organizations.

100th Meridian Initiative

The 100th Meridian Initiative (www.100thmeridian.org/) was one of the first organizations with a goal of preventing the spread of AIS in the Western United States. The 100th Meridian Initiative provided the foundation for the WRP.

Regional Watercraft Inspection and Decontamination (WID) Data Sharing System

In addition to participation in a number of cooperative organizations, states coordinate their watercraft inspection station efforts through the Regional Watercraft Inspection and Decontamination (WID) Data Sharing System (System) in use at more than 200 locations across the West (Figure 7).

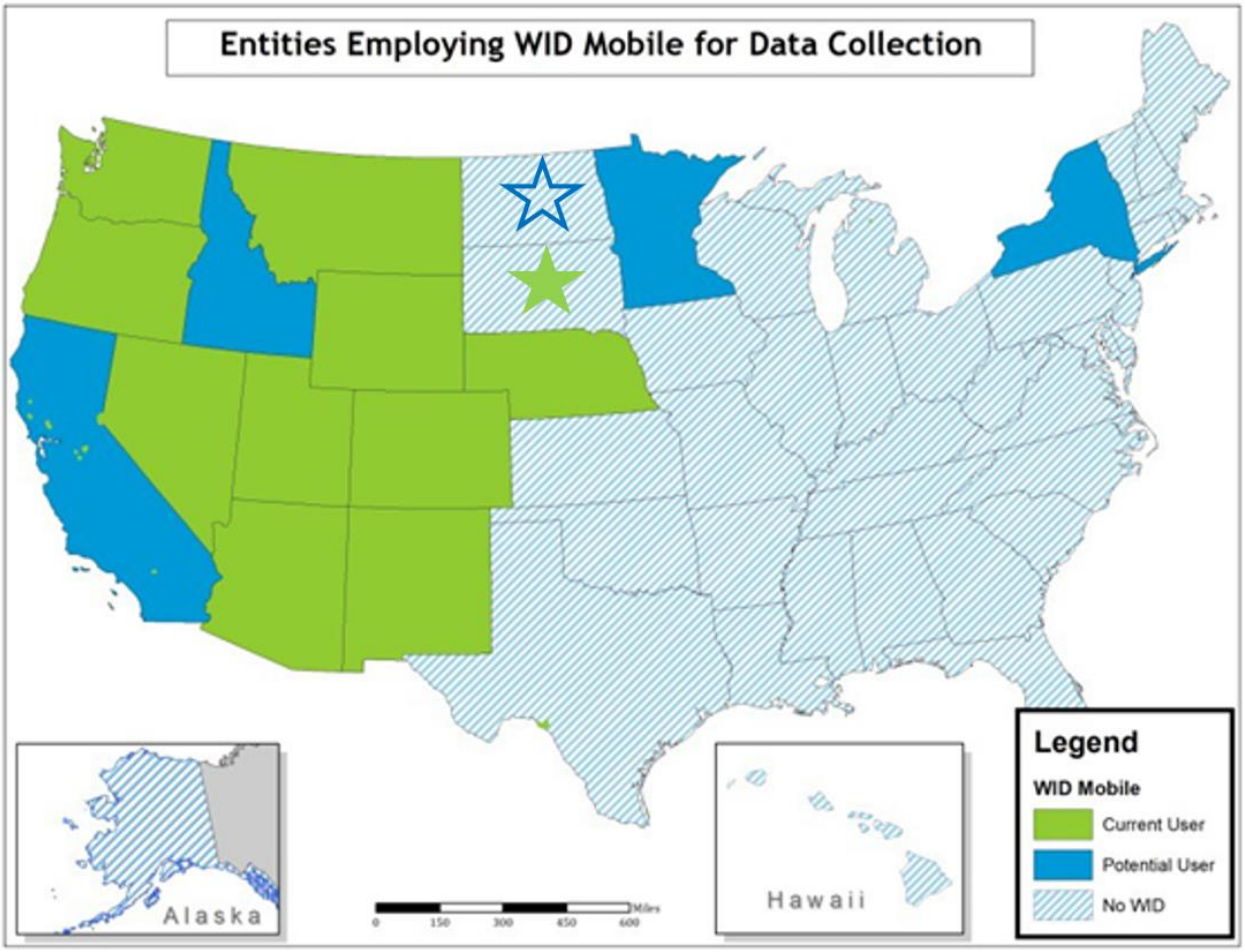

Figure 7. Map Showing States Using the Watercraft Inspection and Decontamination Data Sharing System as of 2019
Note: Filled green star=South Dakota began implementing the WID mobile app during the 2020 season; Hollow blue star = North Dakota intends to begin implementation of the WID mobile app in the near future.

Colorado Parks and Wildlife developed the System to record WID information electronically and share information in a timely manner across jurisdictions to aid collaborative efforts to prevent the spread of zebra and quagga mussels and other AIS.

The System consists of a website, shared database, and phone app for iOS and Android devices. The System reduces operating costs for mobile data collection while increasing accuracy and reliability, and it can be queried for on-demand reporting. The System includes a risk assessment tool to show where boats are moving after launching in mussel-infested waters, and it sends an alert to the next known destination. With the benefits of data sharing proving to be abundant, the states are beginning to utilize the technology and system to send out timely electronic alerts for watercraft leaving infested waters. This increased timely communication has directly increased the number of infested watercraft being intercepted before launching into uninfested waters.

Pacific Northwest Economic Region

The Pacific Northwest Economic Region (PNWER) is a statutory bi-national body that coordinates state AIS efforts with the Canadian jurisdictions of British Columbia, Alberta, Saskatchewan, Yukon, and Northwest Territories. Coordination with the Canadian provinces and other adjacent watersheds in the defense against a dreissenid introduction is important because there is already an example of dreissenids spreading from Minnesota, across the border into Manitoba, through the Red River.

Northwest Power and Conservation Council

The Northwest Power and Conservation Council (NWPCC) is an interstate compact agency established in 1980 under the authority of the Northwest Power Act. It is charged with developing a 20-year energy plan for the Pacific Northwest, as well as a Columbia River Basin Fish and Wildlife Program (NWPCC 2014, 2017). Under the Fish and Wildlife Program, the NWPCC provides independent scientific review of fish and wildlife projects implemented by four federal action agencies (i.e., USACE, Bonneville Power Administration (BPA), U.S. Bureau of Reclamation (Reclamation), and the Federal Energy Regulatory Commission). A key strategy of the NWPCC's 2014 Fish and Wildlife Program focuses on reducing the threats from AIS through preventing the establishment of dreissenids, monitoring and managing introduction pathways, promoting regional coordination and collaboration, and promoting public education and outreach about invasive species.

2.2 EXISTING WATERCRAFT INSPECTION STATIONS IN UPPER MISSOURI RIVER BASIN

As previously stated, watercraft inspection stations are part of the regional response to the growing concern of an introduction of dreissenids into the UMRB. Watercraft inspection programs were established in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska between 2006 and 2011. Watercraft inspection stations for these states are operated by the following organizations:

- Montana – Aquatic Invasive Species Bureau, Montana Fish, Wildlife & Parks.
- Wyoming – Aquatic Invasive Species Program, Wyoming Game and Fish Department.

- North Dakota – Aquatic Nuisance Species Program, North Dakota Game and Fish.
- South Dakota – Aquatic Invasive Species Program, South Dakota Game, Fish and Parks – Wildlife Division
- Nebraska – Aquatic Invasive Species Program, Nebraska Game and Parks Commission.

These states have enforcement capabilities/jurisdiction over prohibited AIS and/or the possession or transportation of AIS that vary according to their statutes and regulations (enforcement programs are generally through fish and wildlife agencies and/or state/county police agencies). The common state law concerning mandatory watercraft inspection stations is that persons transporting watercraft and/or conveyances must stop for inspection or be subject to criminal prosecution in state courts. On the federal side, zebra mussels are listed as an injurious species under the Lacey Act (18 USC §§ 42-43 *et seq*.; 16 USC §§ 3371-3378 *et seq*.), which makes importation (transportation) across state lines a violation and therefore federally enforceable.

2.2.1 Types of Watercraft Inspection Stations and Operations

Many watercraft inspection sites in Montana, Wyoming, North Dakota, South Dakota, and Nebraska are established at strategic locations each year during the recreation season, which typically ranges from early spring to early fall, depending on the state and specific station. Implementation and management of station sites range from use of permanent or long-term sites to temporary or intermittently used sites. Each state uses the management strategy that best addresses their AIS objectives. For example, Colorado has permanent inspection and decontamination stations at heavily used recreational reservoirs near the Denver metropolitan area (e.g., Chatfield State Park), but Nebraska deploys mobile stations to address periods of increased boating activity at several heavily used recreational areas throughout the state. Hours of operation vary by state and specific station. Operations for most stations begin between approximately 7 a.m. and 10 a.m. and end between 5 p.m. and 9 p.m. Permanent stations are typically operated by two personnel for each shift, with additional personnel for high traffic areas or on weekends and holidays. Mobile stations are typically operated by one person per shift.

For this LR/Programmatic EA, watercraft inspection stations were separated into five types:

- Roadside inspection station, which is “conducted at a port of entry, major highway junction, management area, or other geographically relevant choke point. The roadside inspection is typically used to prevent AIS from entering a defined geographic area” (Elwell and Phillips 2016).
- Rampside inspection station, which is set up at a specific water body to inspect watercraft entering/exiting a lake or reservoir (Elwell and Phillips 2016).

- Inspection conducted by appointment at state agency offices, which is available in most of the UMRB states.
- Authorized private inspections by appointment. Independent contractors identified by the state agency are available by appointment to inspect boats at locations throughout the state. These commercial inspections provide flexible options for inspection compliance.
- Roving station, which are typically assigned to a predetermined geographical area, sometimes remaining in a location for only hours at a time, which makes them effective for inspections at high-use boating recreational areas or during watercraft-related activities such as fishing tournaments or boating-related competitions.

2.2.2 Station Locations

All types of watercraft inspection stations are used within the study area, but efforts are focused on roadside and rampside stations associated with lakes and reservoirs (Figure 8). Roadside inspection stations are often strategically located along state borders, with an emphasis on major routes entering the UMRB from the Lower Colorado River Basin and the Great Lakes, two areas in which dreissenids are well established. Many of these stations have a site arrangement that allows some equipment to remain onsite until the end of season. Rampside stations within the study area are best positioned to provide another layer of defense against dreissenids and prevent the spread of locally established plant AIS (e.g., Eurasian watermilfoil, flowering rush, curlyleaf pondweed, purple loosestrife (*Lythrum salicaria)* and common water hyacinth (*Eichhornia crassipes*)*;* EDDMapS 2020[1]).

[1] https://bugwoodcloud.org/CDN/eddmaps/tools/EDDMapS_Entering_Data_Online022020.pdf

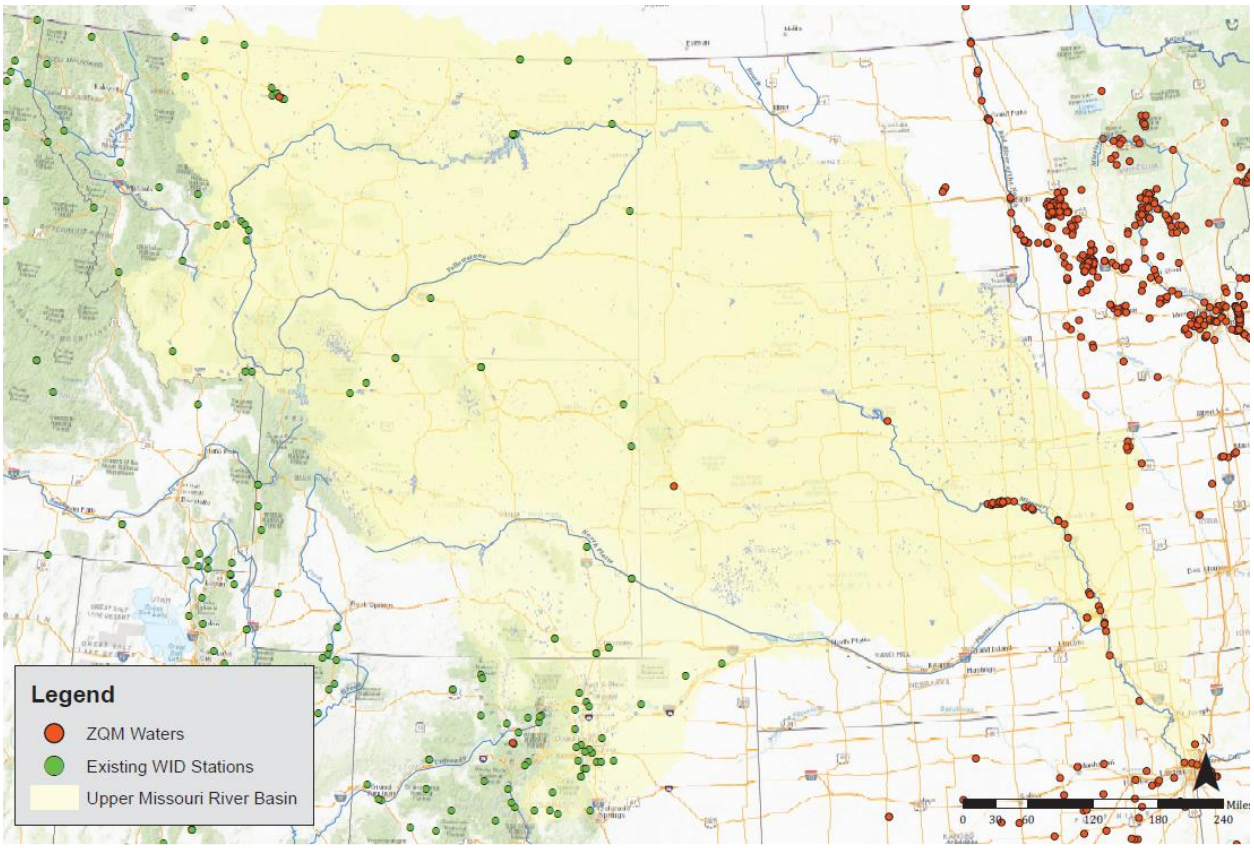

Figure 8. 2019 Watercraft Inspection and Decontamination Stations (green circles) and Established Zebra/Quagga population (red circles) in UMRB

The process of selecting locations for watercraft inspection stations includes the following considerations: safety of personnel and public; ease of public access; infrastructure availability for setting up facilities (electricity, water, restrooms, etc.); and where applicable, availability of a suitable space for conducting decontamination procedures that does not pose any threat to the environment. Although only water is used to decontaminate watercraft, watercraft inspection stations are set up in parking lots, gravel pits, or other areas where water runoff does not present an environmental concern. Some states use a catch mat that is placed under the vessel to capture the runoff, as shown in Figure 9, below.

Figure 9. A Portable Decontamination Unit with a Containment Mat for Wastewater

Most watercraft inspection stations can easily be moved and placed in the most effective locations. Each year, the states engage in an evaluation process to determine whether stations should be added, relocated, closed, or if hours of operation should be adjusted. This evaluation process includes coordination among states and takes into account their specific budgets and statutory authorities as well, as data collected related to boat transportation traffic and fouled boat interceptions.

Together, the states provide multiple levels of protection as vessels travel north or west through the region. As stated in the report by PNWER and PSMFC (2015), "[i]t is important to understand that no one station is the key to prevention efforts. There are examples of fouled conveyances passing through stations, or avoiding stations on certain roadways. As a result, a network of perimeter and interior stations, including permanent and roving stations, is integral to preventing a dreissenid introduction."

The states have varying strategies for distributing inspection station efforts (Figure 10). The Nebraska effort is currently dominated by mobile roving stations, and they consider recreation patterns and risk of infestation to determine the best use of inspection stations. Colorado, adjacent to the UMRB states, tends to establish permanent stations associated with lakes and reservoirs, while Wyoming operates under a hybrid strategy with both permanent and mobile roving stations. States maintain an active web presence with information to inform the public on location and hours of inspection and decontamination planning and locations. Up-to-date information is provided at each state's AIS web page (e.g., https://wgfd.wyo.gov/Fishing-and-Boating/Aquatic-Invasive-Species-Prevention/AIS-Inspection-Locations).

Figure 10. Strategies Adopted among Western States and Provinces as of 2019 to Address Distribution of Watercraft Inspection and Decontamination Station Effort
Note: Green star represents that South Dakota began transitioning to the hybrid model in 2020.

The following tables (Tables 2-6) and figures (Figure 11 and Figure 12) summarize available information on the 2019 inspection stations in the five study area states,

including location, type of station, whether the station is inside or outside the UMRB, and operational information.

Table 2. 2019 Watercraft Inspection Stations in Montana

Location	Type	Upper Missouri River Basin	Avg Hours of Operation
Nashua	Permanent	Inside	13
St. Regis	Permanent	Outside	13
Dillon	Permanent	Inside	13
Eureka	Permanent	Outside	12
Hardin	Permanent	Inside	12
Seville (Blackfeet Nation)	Permanent	Inside	8
Troy	Permanent	Outside	13
Wibaux	Permanent	Inside	13
Anaconda	Permanent	Outside	13
Browning (Blackfeet Nation)	Permanent	Inside	13
Hwy 12 Helena	Permanent	Inside	13
Sula	Permanent	Outside	10
Clearwater Junction (MSLA)	Permanent	Outside	13
Broadus (PRCD)	Permanent	Inside	12
St. Xavier (BCCD)	Permanent	Inside	12
Flowing Wells (GCCD)	Permanent	Inside	13
Fresno Reservoir	Permanent	Inside	9
Ravalli (CSKT)	Permanent	Outside	19
Plains (CSKT)	Permanent	Outside	12
Whitefish Lake City Beach (WLI)	Permanent	Outside	16
Whitefish Lake Decontamination Station (WLI)	Permanent	Outside	9
Bighorn NRA Fort Smith (NPS)	Permanent	Inside	10
Tongue River Reservoir State Park	Permanent	Inside	10
Whitefish Lake State Park (WLI)	Permanent	Outside	16
Glacier National Park (NPS)	Permanent	Outside	Varied
Swan Roving	Roving		8
FWP Region 1 Office	Regional Office	Outside	9
FWP Region 2 Office	Regional Office	Outside	9
FWP Region 3 Office	Regional Office	Inside	9
FWP Region 4 Office	Regional Office	Inside	9
FWP Region 5 Office	Regional Office	Inside	9
FWP Region 6 Office	Regional Office	Inside	9
FWP Region 7 Office	Regional Office	Inside	9

Lewistown Area Resource Office	Regional Office	Inside	4
Havre Area Resource Office	Regional Office	Inside	4
Helena Area Resource Office	Regional Office	Inside	9
Goose Bay Marina	Permanent	Inside	14
Hellgate Recreational Area	Permanent	Inside	14
North BOR Site	Permanent	Inside	14
Silos Area	Permanent	Inside	14
Tiber Boat Ramp -- Marina	Permanent	Inside	14
Tiber Boat Ramp -- VFW	Permanent	Inside	14
Tiber Boat Ramp – Willow Creek	Permanent	Inside	11

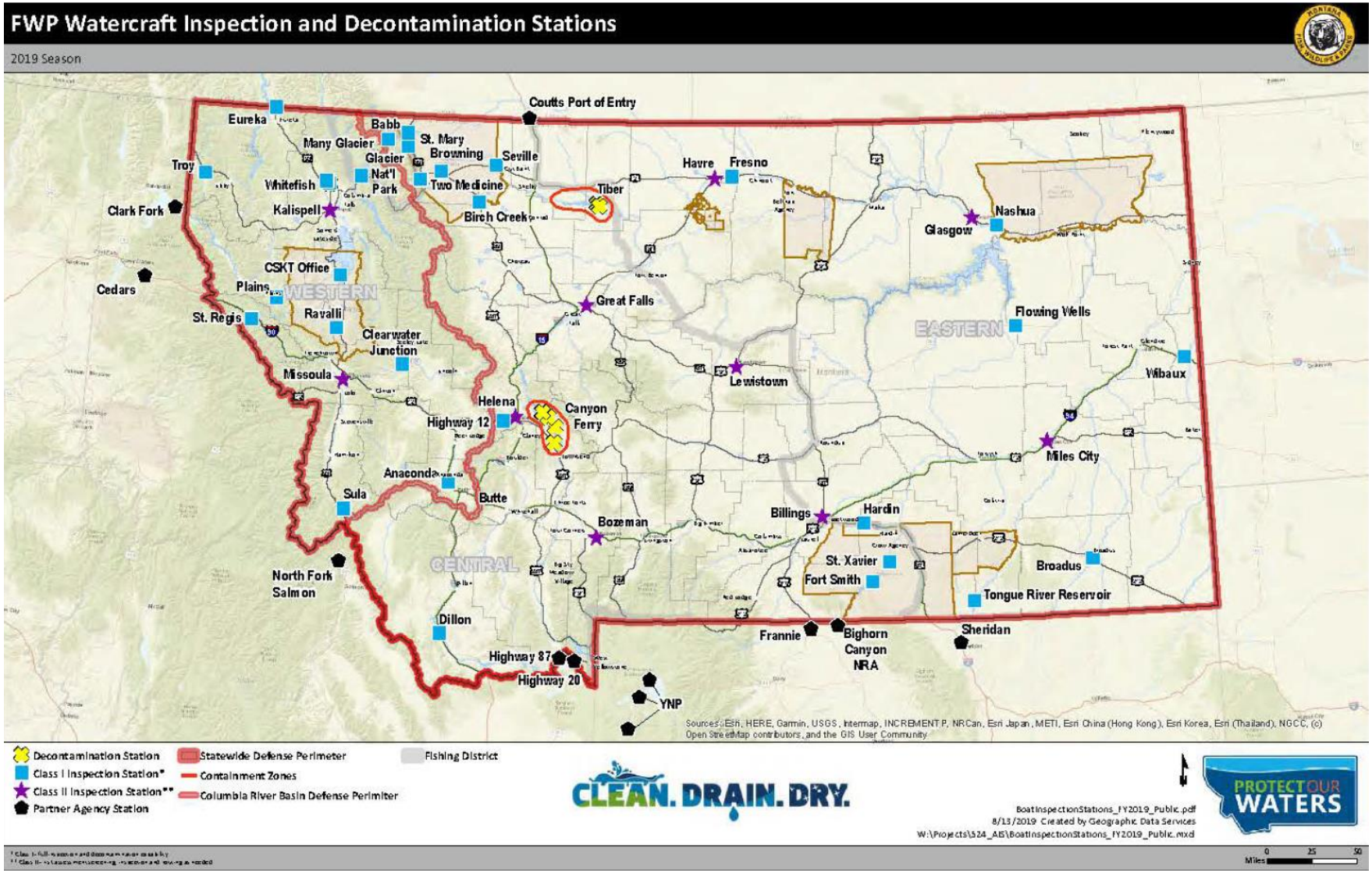

Figure 11. Location of Watercraft Inspections Conducted during 2019 in Montana

Table 3. 2019 Watercraft Inspection Stations in North Dakota

Location	Type	Upper Missouri River Basin	Number of Inspections
Alkaline	Roving	Inside	30
Ashtabula	Roving	Outside	122
Audubon	Roving	Inside	13
Brewer Lake	Roving	Outside	21
Devils Lake	Roving	Outside	512
Dry Lake	Roving	Outside	4
Jamestown	Roving	Inside	10
Metigoshe	Roving	Outside	54
Oahe	Roving	Inside	62
Red River	Roving	Outside	18
Sakakawea	Roving	Inside	145
Sheyenne	Roving	Outside	4
Spiritwood	Roving	Inside	14
Stump Lake	Roving	Outside	54

Table 4. 2019 Watercraft Inspection Stations in South Dakota

Water or Location	Station Type Access or Roadside	Upper Missouri River Basin	Number of Inspections
Angostura Reservoir	Access	Inside	921
Belle Fourche Reservoir	Access	Inside	1490
Pactola Reservoir	Access	Inside	177
Sheridan Lake	Access	Inside	96
Shadehill Reservoir	Access	Inside	239
Lake Oahe	Access	Inside	623
Lake Sharpe	Access	Inside	627
Lake Francis Case	Access	Inside	777
Brant Lake	Access	Inside	14
East Vermillion	Access	Inside	46
Lake Albert	Access	Inside	2
Lake Madison	Access	Inside	96
Lake Mitchell	Access	Inside	1
Lake Thompson	Access	Inside	6
Wall Lake	Access	Inside	29
Lewis and Clark Lake	Access	Inside	164
Antelope Lake (Day Co.)	Access	Inside	9
Bitter Lake	Access	Inside	50
Clear Lake	Access	Inside	5
Enemy Swim	Access	Inside	9
Lake Pointsett	Access	Inside	14
Mina Lake	Access	Inside	10
Pickerel Lake	Access	Inside	23
Richmond Lake	Access	Inside	9

Water or Location	Station Type Access or Roadside	Upper Missouri River Basin	Number of Inspections
Roy Lake	Access	Inside	4
Waubay Lake	Access	Inside	88
Oahe Dam	Roadside	Inside	1637
Hwy 14/34 Hayes	Roadside	Inside	84
I-90 Vivian	Roadside	Inside	35
Hwy 50 Wagner, SD	Roadside	Inside	33
Junct. Hwy 44 and 50 Platte	Roadside	Inside	30
I-90 Presho, SD	Roadside	Inside	124
I-90 White, SD	Roadside	Inside	433
Hwy 14 Volga and Brookings, SD	Roadside	Inside	73
Fisheries Shop - Sioux Falls	Roadside	Inside	2
I-29 north of Sioux City	Roadside	Inside	146
I-90 Mitchell	Roadside	Inside	177
I-29 north of Dell Rapids	Roadside	Inside	170
I-90 Salem	Roadside	Inside	96
Junct. Hwy 50 and 37 Avon and Tyndall	Roadside	Inside	14
Hwy 50 - Vermillion	Roadside	Inside	50
Junct. Hwy 81 and 46 north of Yankton	Roadside	Inside	135
Junct. Of Hwy 20 and 25 south of Webster	Roadside	Inside	73
I-29 at Sisseton, SD	Roadside	Inside	2
Junct. Of I-29 and Hwy 12 near Summit, SD	Roadside	Inside	236
HWY 10 - Sisseton	Roadside	Inside	10
Hwy 81 south of Cones Corner	Roadside	Inside	21
	Total Access- Based Inspections		**5,529**
	Total Roadside-Based Inspections		**3,581**
	Total Inspections		**9,110**

Table 5. 2019 Watercraft Inspection Stations in Nebraska

Location	Type	Upper Missouri River Basin	Avg Hours per Visit
Blair (Missouri River)	Roving	Outside	2
Calamus*	Roving	Outside	6
Davis Creek*	Roving	Outside	6
Decatur (Missouri River)	Roving	Outside	2
Gavins Point Tailwaters (Missouri River)	Roving	Outside	3
Kramper Lake	Roving	Outside	3

Miller Creek (Lewis and Clark Lake)	Roving	Outside	2
Pelican Point (Missouri River)	Roving	Outside	2
Summit Lake	Roving	Outside	3
Sunshine Bottoms (Missouri River)	Roving	Outside	3
Weigand Marina (Lewis and Clark Lake)*	Roving	Outside	6
Willow Creek	Roving	Outside	3
Lake Yankton	Roving	Outside	3
Verdel Landing (Missouri River)	Roving	Outside	3
Box Butte	Roving	Outside	6
Lake Minatare	Roving	Outside	6
Merritt*	Roving	Outside	6
Valentine Refuge Lake	Roving	Outside	6
Bellevue (Missouri River)	Roving	Outside	2
Bluestem	Roving	Outside	2
Branched Oak*	Roving	Outside	6
Brownville (Missouri River)	Roving	Outside	2
Burchard	Roving	Outside	3
Carter*	Roving	Outside	4
Cunningham*	Roving	Outside	4
Flanagan	Roving	Outside	2
Indian Cave (Missouri River)	Roving	Outside	2
NP Dodge Park (Missouri River)*	Roving	Outside	6
Olive creek	Roving	Outside	2
Pawnee*	Roving	Outside	6
Peru (Missouri River)	Roving	Outside	2
Prairie Queen	Roving	Outside	2
Riverview Marina (Missouri River)	Roving	Outside	2
Rockford	Roving	Outside	3
Rulo (Missouri River)	Roving	Outside	2
Wagon Train	Roving	Outside	2
Walnut Creek	Roving	Outside	2
Wanahoo	Roving	Outside	3
Wehrspann	Roving	Outside	2
Wildwood	Roving	Outside	2
CNPPID Canyon Lakes	Roving	Outside	4
Enders	Roving	Outside	4
Elwood	Roving	Outside	4
Harlan*	Roving	Outside	6
Johnson*	Roving	Outside	6
Maloney	Roving	Inside	6
McConaughy*	Roving	Outside	6
Medicine Creek	Roving	Outside	4
Red Willow	Roving	Outside	4
Jeffrey	Roving	Outside	2
Sherman*	Roving	Outside	6
Sutherland	Roving	Inside	4
Swanson*	Roving	Outside	6
Wellfleet	Roving	Outside	2

Sites denoted by asterisk (*) are emphasis areas where historically, the majority of the inspection station efforts have been expended in these areas.

Table 6. 2019 Watercraft Inspection Stations in Wyoming.

Location	Type	Upper Missouri River Basin	Effort
Glendo Check Station	Permanent	Outside	N/A
Frannie POE	Permanent	Outside	N/A
North Cody Check Station	Permanent	Outside	N/A
Anvil Draw - FGR	Permanent	Outside	N/A
Evanston POE	Permanent	Outside	N/A
Kemmerer	Permanent	Outside	N/A
Alpine POE	Permanent	Outside	N/A
Salt River Pass	Permanent	Outside	N/A
Cheyenne I-25 POE	Permanent	Inside	N/A
Cheyenne I-80 POE	Permanent	Inside	N/A
Laramie POE	Permanent	Outside	N/A
Beulah Visitor Center	Permanent	Outside	N/A
Sheridan POE	Permanent	Outside	N/A
Torrington POE	Permanent	Outside	N/A
Casper Regional Office	Regional Office	Outside	N/A
Cody Regional Office	Regional Office	Outside	N/A
Lander Regional Office	Regional Office	Outside	N/A
Green River Regional Office	Regional Office	Outside	N/A
Jackson Regional Office	Regional Office	Outside	N/A
Pinedale Regional Office	Regional Office	Outside	N/A
Cheyenne Headquarters	Regional Office	Inside	N/A
Laramie Regional Office	Regional Office	Outside	N/A
Sheridan Regional Office	Regional Office	Outside	N/A

See Figure 12 for distribution of inspection stations in Wyoming.

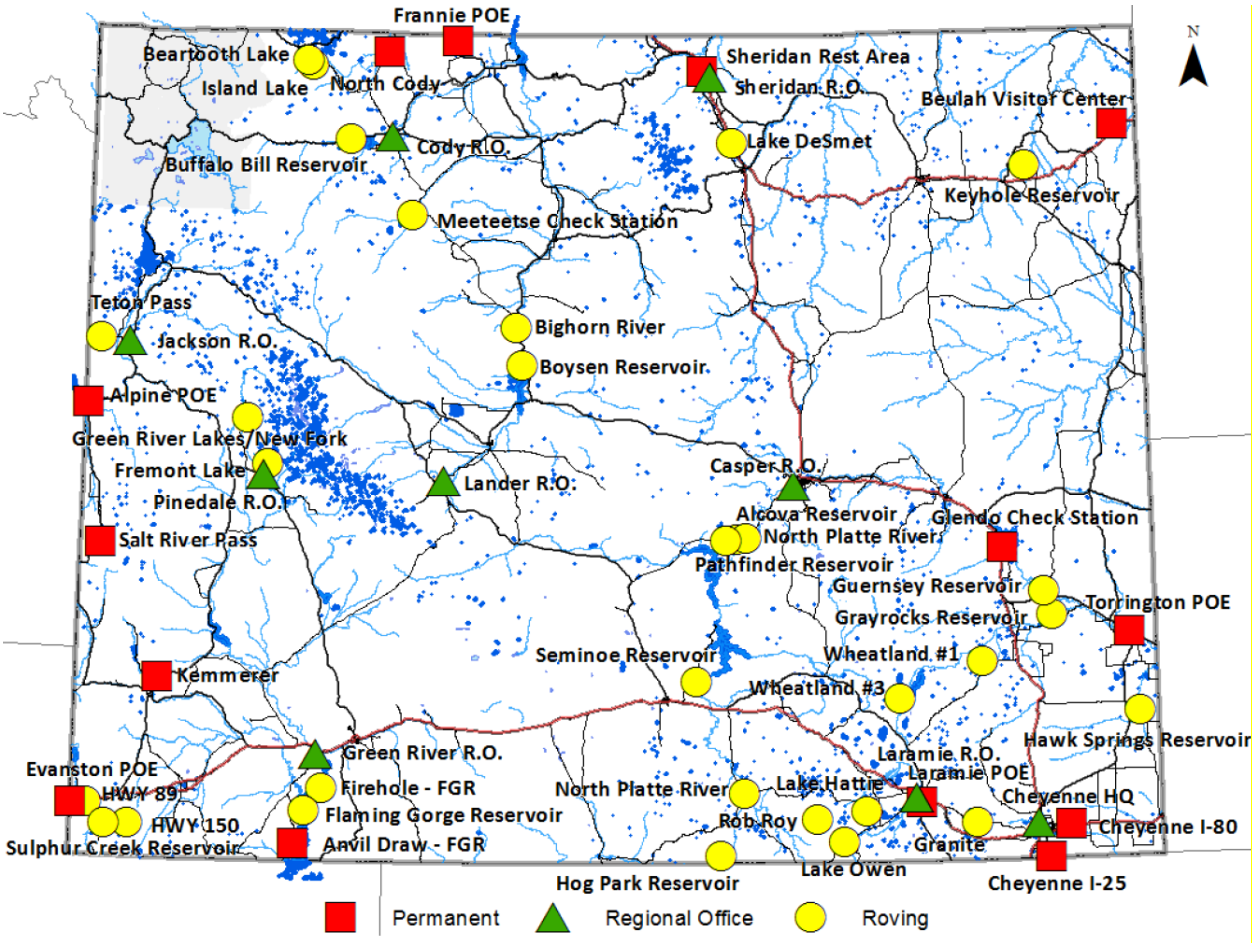

Figure 12. Location of Watercraft Inspections Conducted during 2019 in Wyoming

2.2.3 Station Equipment and Inspection and Decontamination Procedures

A typical station consists of a shelter/covering, such as a shipping container, a construction trailer, canopy, or tent; a transport vehicle; a hot water pressure washer; outreach and educational materials; directional devices such as cones and signage; and applicable personnel amenities (heaters for cold weather, portable restrooms, etc.). Figure 13 shows an example of a roadside inspection station.

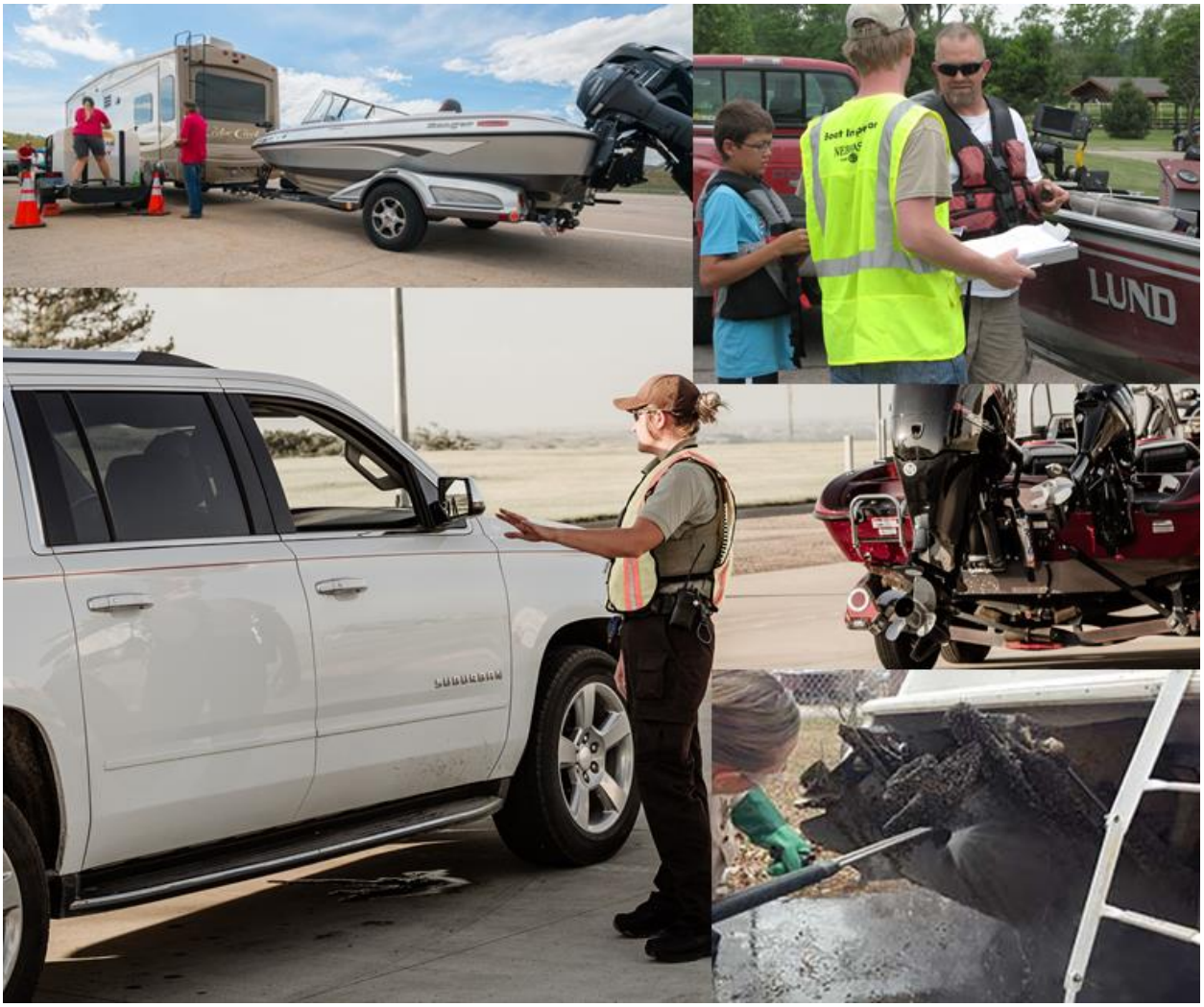

Figure 13. Example of Roadside Watercraft Inspection Station

The states follow similar protocols and standards for watercraft inspections based on the Uniform Minimum Standards and Protocols for Watercraft Inspection and Decontamination Programs for Dreissenid Mussels in the Western United States III (Elwell and Phillips 2016). Procedures include a screening interview to assess the risk level of the watercraft, distribution of information about AIS (Section 2.2.5), and a boat inspection based on risk level.

The screening interview includes questions pertaining to watercraft origin; usage, including when and where it was last used; whether it was cleaned, drained, and dried; knowledge of AIS. Based on the interview, the inspector conducts an inspection ranging from a cursory investigation of key boat and trailer elements to a full investigation of all potentially infested areas. The outcome of the inspection results in either letting the boat pass through or performing a partial decontamination (often called a “hot wash”) or full decontamination.

A partial decontamination is typically performed when a vessel has recently been in a water body that is dreissenid infested, positive, or suspect; is grimy; or contains dead mussels or AIS plants. It entails using a pressure washer to spray hot water all over the surface of the vessel and into the engine to kill anything not seen and takes approximately 20 minutes to complete (USACE, NWW 2016).

A full decontamination is performed when live mussels are present. Full decontaminations involve the same equipment, but are more detailed, taking hours instead of minutes (USACE, NWW 2016). Some decontaminations can be performed onsite at the inspection station if equipment and situation allow, and some decontaminations require sending the boat to another location, such as a shipyard, impound lot, or other location. Following a full decontamination, additional dry time may be required to ensure no live mussels remain on the vessel, and a 30-day dry time is the typical protocol. In its simplest form, drying is a technique for desiccating dreissenids or other invasive species to decrease their viability (Morse 2009).

On occasion, watercraft owners request a decontamination if they have been at infested water bodies; these decontaminations may be performed at the owner's home if there are adequate containment provisions.

To achieve effective decontaminations (partial or full), inspectors use water temperatures of 120°F for interior compartments and 140°F for the exterior (hull, engine, and trailer) (Elwell and Phillips 2016).

2.2.4 Magnitude of Existing Watercraft Inspection Programs

Data provided by each UMRB state was used to characterize the existing watercraft inspection station effort during 2019 (Table 7). The states provided 2019 data to establish a baseline, and it is anticipated that they will have similar numbers of sites and costs in the future. There were over 178,000 inspections completed in 2019, and at least 35 watercraft showed evidence of dreissenid contamination. In some cases, watercraft were decontaminated based on the launch history reported by the boater. For example, in Nebraska, one watercraft was decontaminated during 2019 because it was previously launched at Angostura, a suspect contaminated water body in South Dakota. All fouled boats found in Wyoming during 2019 originated from outside of Wyoming.

Table 7. 2019 Watercraft Inspection/Interception Program Data by Select States

State	Number of Watercraft Inspected	Fouled Dreissenid Boats Intercepted	Origin of Fouled Watercraft	Destination of Fouled Watercraft
Montana	113,168	16	Not specified, but data pooled from 2017-2019 includes the following states: MN, IA, WI, IL, MI, IN, OH, NY, TX AZ, NV, CA.	Not available

State	Number of Watercraft Inspected	Fouled Dreissenid Boats Intercepted	Origin of Fouled Watercraft	Destination of Fouled Watercraft
Wyoming	52,131	19	Lake Powell (7), Jordanelle Reservoir (2), Willard Bay (2), East Canyon Reservoir (1), Flaming Gorge (1), Rockport Reservoir (1), Pineview Reservoir (1), St Lawrence River, Canada (1), Lake Havasu (1), unspecified water, Michigan (1), unspecified water, New York (1)	Bear Lake (7), Flaming Gorge (6), Undecided (2), Lake Pend Oreille (1), Alcova Reservoir (1), Pinedale (1), unspecified water, Washington (1)
North Dakota	1,063	0		
South Dakota	9,110	0 intercepted during standard WID activities	Lewis and Clark and Francis Case (SD) – noted during end-of-season decontamination events at marinas	Off-water winter storage
Nebraska	2,843	0		

2.2.5 Public Awareness

Public awareness about the seriousness of AIS is an important element of the ongoing efforts to prevent an introduction of dreissenids and further spread of other AIS within the UMRB. The states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska and regional organizations work to educate the general public about AIS issues and ways individuals can help with prevention efforts. Public outreach includes ad campaigns such as “Clean. Drain. Dry.” and “Stop Aquatic Hitchhikers” and “Don’t Let it Loose,” which are aimed at keeping boats free from AIS. These and other AIS messages are communicated through targeted trainings and presentations, social media, news releases, videos, public service announcements, signage, materials included with fishing and boating licenses, and flyers and brochures distributed at sporting and boat shows, fairs, and other special events.

Watercraft inspection stations provide a valuable opportunity to increase public awareness. During the inspection, educating the public about AIS is a main focus of every inspector/boat owner interaction, whether or not any type of AIS is found on the watercraft. Additionally, most inspection stations offer displays (Figure 14), posters, brochures, rack cards, or other materials to educate the public about AIS. Signage used to direct traffic to the inspection station location may include educational messages.

Advances to more modern platforms in station technology (Figure 15) are also improving outreach and education. For example, mobile and fixed stations (e.g., CD3 units, cd3systems.com) can be wrapped like a public billboard, and closed circuit WiFi accessible to the public can provide mobile device connectivity for digital education resources. Custom applications or platforms could provide interactive data and feedback from users, such as having the user certify that prevention or decontamination tasks were completed, and tracking the number and timing of users. Interactive technology may provide users a sense of belonging and purpose in the fight against AIS, and promote the outreach and education aspect as an increasingly effective tool.

Figure 14. Display Demonstrating How Mussels Can Attach to Watercraft

Figure 15. Example of an Advanced Technology Decontamination Station

In addition to educating recreational boaters about AIS, organizations such as PSMFC and PNWER are communicating with commercial entities on the issue. They are communicating with boat manufacturers about providing easy access to ballast water tanks on wakeboard boats, which would allow decontamination of water left in the ballast tanks. The regional partners are also communicating with commercial boat haulers, boat brokers, auctions, online sale sites, and marinas with moored boats in infested water bodies such as the Lower Colorado River and Great Lakes.

2.2.6 Current Costs

In 2019, there were at least 181 watercraft inspection stations established in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska. Of those stations, at least 86 were in the boundary of the UMRB within the five states. The same number of stations or more are projected for current and future years. Annual costs for operating watercraft inspection stations in each state are provided in the table below. The cost to implement in South Dakota is estimated to be the costs necessary to comprehensively implement the ideal WID program; it is estimated that cost of the 2020 inspection station season was $280,957.

Table 8. Annual Watercraft Inspection Station Operating Costs by State

State	Cost to Implement
Nebraska	$276,738
Wyoming	$841,730
S. Dakota	$2,138,010
N. Dakota	$425,250
Montana	$825,630
Total	**$4,507,358**

In addition to operating costs, annual maintenance required for the hot water pressure washers (wash unit), include winterization, changing the oil, and replacing tires, valves, thermostats, hoses, and fittings. The annual maintenance cost for the wash unit averages $1,500 per unit, and the total estimated annual maintenance cost for the wash units for stations inside the UMRB is $4,507,358.

2.3 EXISTING WATERCRAFT INSPECTION STATIONS AT SOURCE WATER BODIES

Infested water bodies of significant concern include the Great Lakes; Lake Powell (Utah and Arizona), Lake Mead (Nevada and Arizona), and Havasu Lake (Arizona and California) on the lower Colorado River; and Lake Pleasant (Arizona) on the Aqua Fria River. In 2019, 8 of the 19 fouled vessels intercepted at watercraft inspection stations in Wyoming originated from one of these infested sources (Table 7, Section 2.2.4).

Currently, there are many watercraft inspection/cleaning stations in the Great Lakes states operated by a combination of state, county, city, and private organizations.

Lakes Powell and Mead are both within National Recreational Areas (NRA) and are administered by the National Park Service. Lake Powell is within the Glen Canyon NRA, and Lake Mead within the Lake Mead NRA. Jurisdiction over Lake Havasu is complex, including federal, state, and local government agencies. The roles and responsibilities of all these agencies at Lake Havasu are outlined in a memorandum of understanding (BLM 2014). Currently, fouled boats can leave the NRAs without requirement of decontamination.

In September 2018, the Arizona Game and Fish Department updated Director's Order 3 – R09/18 (originally issued May 2016), which establishes the mandatory conditions and protocols for all watercraft movement from AIS-infested waters and locations (AZGFD 2018). The protocols use exposure time in infested waters to determine which treatment to apply to watercraft, vehicles, conveyances, or other equipment. For example, if the watercraft was exposed or moored in infested waters less than 5 days, the watercraft is mandated for a partial decontamination. If the watercraft was exposed or moored in infested waters more than 5 days, the watercraft is mandated for a full decontamination with drying times up to 7 days during May through October and up to 18 days during November through April. The other states mentioned above with infested water bodies do not have mandatory conditions and protocols for watercraft movement from AIS-infested waters.

2.4 EXISTING MONITORING ACTIVITIES

This LR/Programmatic EA addresses two kinds of monitoring, water chemistry monitoring and early detection monitoring. Water chemistry monitoring includes monitoring water bodies to identify a variety of characteristics, including temperature, minerals, sedimentation, etc. Water chemistry information of infested and uninfested water bodies can be compared to determine if dreissenids in particular infested water bodies could pose a greater risk for establishment in particular uninfested water bodies due to similar water chemistry. When considered in conjunction with pathways (transportation routes and boater traffic) that exist between the water bodies, this information can help determine the level of risk different infested water bodies may pose to a specific uninfested water body, such as specific USACE reservoirs.

Monitoring supports WID and possible rapid response activities to halt the spread of dreissenids by identifying infested waters within the UMRB and in adjacent river basins. Early detection monitoring is required to assess the efficacy of prevention efforts, such as watercraft inspection programs, and for the early detection of new dreissenid populations. Under certain circumstances, small isolated dreissenid populations could be controlled or eradicated. Failure to detect new populations through early detection programs would likely result in rapid uncontrolled spread of dreissenids throughout the UMRB. Therefore, monitoring in the UMRB is key to prevention efforts.

Reclamation, along with the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska, and USACE perform early detection monitoring for dreissenids in the UMRB. However, current monitoring efforts may be insufficient according to a report by Counihan and Bollens (2017) that discusses early detection monitoring for veligers.

Without adequate monitoring, dreissenids could go undetected and become established, while at the same time, watercraft inspections stations are established in locations based on inaccurate dreissenid population location data. As an example of the importance of monitoring, Montana tested positive for veligers in the Tiber Reservoir in November 2016, although they were previously not thought to be present in the state at all (Montana Fish, Wildlife and Parks 2016). With this information, appropriate measures can be taken to reduce the risk of them spreading.

The Omaha District of USACE perform seasonal veliger sampling and adult mussel monitoring at various locations within the UMRB using two standard methods: plankton tows and solid substrate inspections. This Dreissenid monitoring effort is included as part of the standard water quality sampling regime conducted by USACE. A plankton tow is a method of collecting plankton, other organisms, and sedimentation by towing a net-like structure through the water. Solid substrate inspections involve placing a structure in the water that is composed of various surface types known to be conducive to dreissenid establishment and inspecting regularly for the presence of dreissenids, and/or conducting visual inspections of hard surfaces such as riprap, submerged walls, and boat ramps.

In spring of 2020, USACE began collecting subsamples from surface tows at near-dam sampling sites into standardized eDNA (environmental DNA) collection vials. The eDNA subsamples are processed to detect presence of Dreissenid DNA particles in the subsampled water, with the intent to increase efficiency and more rapid turn-around of results to improve response and reactive timing if results indicate the presence of dreissenid DNA.

Monitoring locations are generally determined by the proximity of watercraft recreation areas to river confluences and likely areas of introduction. Standard monitoring is additionally occurring in the Salt Valley (Lincoln, NE) and Papillion Creek watersheds (Omaha, NE) where high recreational boater use is distributed among many small impoundments in the densely populated area of eastern Nebraska. Sampling typically starts in early June and runs until early October, which is when the number of veligers is expected to be the highest. Samples and data collected from these monitoring methods are sent to contracted laboratories monthly, or more frequently as eDNA methods continue to be incorporated into the monitoring regime.

2.5 EXISTING CONTINGENCY AND RESPONSE PLANNING

Regional Efforts

In 2008, PSMFC and USFWS, in cooperation with the Columbia River Basin Team of the 100th Meridian Initiative, completed the Columbia River Basin Interagency Invasive Species Response Plan: Zebra Mussels and Other Dreissenid Species (Heimowitz and Phillips 2008). The plan was updated in 2014. Wimbush et al. (2009) demonstrated the potential for eradicating zebra mussels with a robust rapid response plan. The WRP on Aquatic Nuisance Species developed the Quagga-Zebra Mussel Action Plan (QZAP) (WRP 2010) in response to the rising threat of invasive quagga and zebra mussels in

the West. The QZAP summarizes strategies to address the invasion of zebra and quagga mussels in the West, and to identify and prioritize the specific actions that are needed to comprehensively prevent the further spread of quagga and zebra mussels, respond to new infestations, and manage existing infestations. The 2019 QZAP update (WRP 2019) documents progress made over the last ten years, provides direction, and informs future decision making for quagga and zebra mussel management.

State Efforts

The state of Montana has rapid response integrated into their Zebra/Quagga Mussel Management Plan and is planning rapid response exercises to scenario-based invasion risks or presumed positive results from monitoring/sampling. The site for the scenario-based rapid response exercise is Fort Peck reservoir and will include collaborative efforts from federal partners and neighboring states. Wyoming, North Dakota, South Dakota, and Nebraska also have rapid response planning integrated into their state invasive species management procedures. For example, when Zebra mussels were detected during summer 2018 at Glenn Cunningham Lake in Nebraska, the reservoir was drawn down to allow freeze kill during winter 2018/2019. These plans are critical in that they are the guidance document for natural resource managers to plan for and provide a rapid response effort to a dreissenid mussel infestation in their state waters.

Federal Efforts

The Department of Interior framework (DOI 2016) provides guidance for developing rapid response plans. The Reclamation (2010) Regional Plan covers the Upper Colorado River Basin, along with the Rio Grande River Basin. The DOI's initiative to safeguard the West (2021) includes expansion of dreissenid prevention efforts to the UMRB.

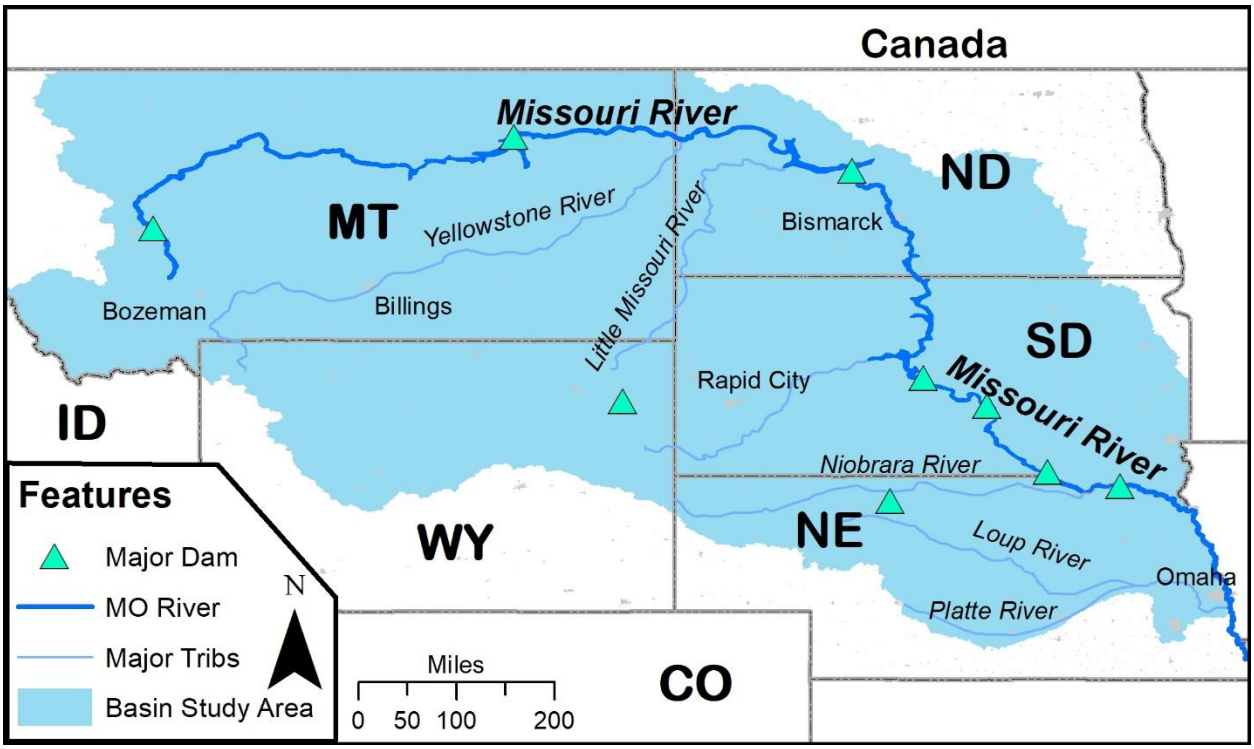

Figure 16. Distribution of Large Dams (≥ 75' high) within the UMRB relative to the Major Population Centers

SECTION 3 - PLAN FORMULATION

Development of this report generally followed the USACE six-step planning process. This process identifies and responds to problems and opportunities associated with the federal objective, as well as specified state and local concerns. The process provides a flexible, systematic, and rational framework to make determinations and decisions at each step based on constraints, objectives, and assumptions. This allows the interested public and decision-makers to be fully aware of the basic assumptions employed, the data and information analyzed, the areas of risk and uncertainty, and the significant implications of each plan that is considered.

3.1 PROBLEMS

The UMRB is at high risk of dreissenid infestation due to the mobility of recreational boats and other watercraft that are trailered across watersheds over interstate transportation systems, which provides an easy mechanism for transferring infestations. In addition, the high survival rate of the dreissenids once established, their ability to be hidden on or inside of boats and other structures, and the high financial and environmental costs of infestation present serious problems to those who live, work, or recreate in the UMRB. Fundamentally, the problems can be divided into three categories: Impacts to Infrastructure, Impacts to Health and Safety, and Impacts to the Environment. These impacts are summarized below. Additional details related to the impacts are provided in the subsequent paragraphs and in Section 4.

Infrastructure Impacts:

- Dreissenids attach to submerged hydropower, navigation, and water supply infrastructure, making them less efficient or entirely ineffective, resulting in significant impacts to electrical generation; the movement of goods; and irrigation, municipal, and industrial water supplies.
- A dreissenid infestation is rapid and destructive and may not be noticed until it causes a failure of operations of critical infrastructure. By that time, significant actions may be required to clean and restore infrastructure functions.

Health and Safety Impacts:

- Infestation could present safety issues for employees of utilities, dams, and other facilities if fire suppression systems are impacted or disabled by dreissenids.
- The presence of dreissenids and the shells of dead dreissenids along beaches raise the risk of physical injury (cuts and scrapes), albeit minor, to the recreating public.
- Dense colonies of dreissenids attached to docks, buoys, and other recreational boating infrastructure can negatively impact the integrity of such structures and represent safety risks to the recreating public.

Environmental Impacts:

- Dreissenids colonize rapidly, and have potential to dramatically affect water quality once established. Their ability to filter and remove nutrients from the water affects the base of the food chain by significantly reducing the nutrients that are available to other organisms. There could be compounding effects with other AIS, leading to additional loss of resources for native biota.
- The habitat impacts of an infestation of dreissenids and the potential cascading effects to the food chain would be expected to negatively impact Endangered Species Act (ESA)-protected species in the UMRB in a significant way (see attached *Federal Natural Resources Law Compliance and Biological Evaluation* appendix for a list of threatened or endangered species). An uncontrolled infestation in the UMRB could reduce the quality of designated critical habitat for ESA-listed fish, diminish necessary aquatic resources that contribute to the critical habitat, and undo millions of dollars in Federal investment in pallid sturgeon recovery improvements made over the previous 20 years.
- An infestation of dreissenids in the UMRB could significantly disrupt hatchery operations, affecting sport fish abundance and commercial and Tribal fisheries.

The inherent potential for dreissenids to spread via fouled watercraft, combined with the large adverse impacts to existing infrastructure and ecosystems that would result from an infestation, present significant risks to the UMRB. Once established in one area, they can rapidly spread downstream within watersheds during their free-swimming larval stage. The November 2016 discovery of veligers in the Tiber Reservoir in Montana is further indication of the level of risk.

Dreissenids have an ability to rapidly colonize and their high water filtration rate (Fanslow et al. 1995) causes dramatic effects on water quality and the base of the food chain, causing detrimental effects to native fish populations and the entire food web, with the potential for cascading trophic effects. Invasive mussels filter particles from the water column and concentrate nutrients in their feces, changing the nutrient regime and enriching sediment. Water clarity can increase as plankton are filtered out of the water column, which can alter the prey base of native fishes. This can also lead to an increase in aquatic plants, as well as aquatic plants taking root in deeper water.

Conditions for invasive plants and non-native fish improve, which further decreases habitat for native organisms and could result in increased competition and predation on native fishes, including ESA-listed species. In the Great Lakes, zebra mussels contributed to a bloom of toxic cyanobacteria (Vanderploeg et al. 2001), sometimes called blue-green algae, which can have a detrimental effect on water quality, as well as cause health impacts to people and pets.

Adult dreissenids attach to surfaces, and as they colonize, they can biofoul all types of water-related infrastructure. Many facilities located in basins already infested by dreissenids face costs from control measures and additional O&M required to manage the impacts of an infestation. These costs are typically passed on to consumers or taxpayers. From 1989 to 2006, estimated direct costs associated with zebra mussels in the Great Lakes and Mississippi Basin ranged from $1 billion to $1.5 billion, and similar costs are expected in the West in the event of an invasion (Connelly et al. 2007).

Based on the facility vulnerability assessments completed by Reclamation, authorized purposes at USACE projects (e.g., hydropower, navigation, and fish and wildlife mitigation) are all vulnerable to the impacts of a dreissenid infestation. Examples of infestation impacts are described below:

- Major hydropower components at risk of being fouled or damaged by a dreissenid infestation include:
    - Raw water systems, which could result in a powerhouse shutdown.
    - Flap gates, which could result in water entering protected areas.
    - Instrumentation, which could result in plant operation problems.
- Major water control components at risk of being fouled or damaged by a dreissenid infestation include raw water systems, instrumentation, and gate seals.
- Major fish passage and hatchery facility components at risk of being fouled or damaged by a dreissenid infestation include all submerged surfaces in low velocity areas, screens, and fish bypass systems.
- Major water supply and treatment facilities components at risk of being fouled or damaged by a dreissenid infestation include all submerged surfaces and screens.
- Dreissenid establishment in the bypass system and piping of juvenile and adult fish bypass and monitoring facilities would cause extraordinary stress on ESA-listed fish due to injury, descaling, and impact trauma.
- Due to their water filtration abilities, dreissenids can affect the food chain, decreasing the food supply for young and small fish and increasing habitat for fish that prey on ESA-listed fish.
- Recreation, Tourism, and Waterfront Property Values: a dreissenid infestation affects the recreational fishery by altering fish population dynamics, and the fresh-water beaches, turning sandy beaches to jagged shorelines due to the life cycle of dreissenids. The negative effects to both the recreational fishery and the quality of fresh-water beaches will reduce recreation and tourism in the affected area.

An example of the degree of damage they can impose is shown in Figure 17. More detailed descriptions of impacts and associated estimated costs to USACE authorized purposes, as well as to water supply, recreation, and tourism are provided in Section 4.

Figure 17. Quagga Mussels on the Davis Dam in California
Source: Reclamation 2007

3.2 OPPORTUNITIES

Within the limits of the authorizing legislation, several opportunities were identified to address the significant problems associated with dreissenids and other AIS by decreasing the risk of infestations within the UMRB and at USACE-owned and operated reservoirs. The opportunities, which were developed by collaborating with the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska, include augmenting the AIS detection and decontamination efforts and expanded monitoring and contingency planning activities.

USACE has the opportunity to collaborate in a multi-state and multi-agency partnership that will do the following:

- Use existing knowledge to identify high risk infestation areas, transportation corridors, and types of infrastructure to address UMRB vulnerabilities to an infestation by inspecting watercraft traveling from infested waters to the UMRB.
- Educate recreational users of watercraft and public lands about the risk and damages caused by aquatic invasive species.
- Intercept dreissenids to reduce the risk of an infestation in the UMRB.
- Monitor the water chemistry in the UMRB and compare it to the water chemistry of infested water bodies to help determine the risk of dreissenids from specific infested water bodies becoming established in the UMRB. This provides an opportunity to inform risk management decisions.

- Detect veligers before populations of dreissenids become established in the UMRB.
- Prevent organisms from infesting new waters through strategically placed watercraft inspection stations, public education, and effective rapid response plans.
- Develop rapid response plans, which would be implemented upon initial detection of dreissenids in the UMRB.

3.3 PLANNING OBJECTIVES AND CONSTRAINTS

Planning Objectives

Planning objectives represent desired positive changes. They are generated to describe how problems could be addressed by taking advantage of available opportunities. The following objectives for the UMRB were identified for this evaluation and cover a 50-year period of analysis (2023-2073):

- Intercept watercraft on existing pathways between infested and non-infested water bodies in the UMRB to detect dreissenids on the watercraft and decontaminate the watercraft to reduce the risk of infestation.
- Identify water chemistry of the UMRB and compare it to the water the chemistry of infested water bodies to better understand the risks to waters of the U.S. in the UMRB, and to prioritize areas for development of follow-up actions.
- Prepare rapid response plans in the event dreissenids are detected.
- Using the existing facility vulnerability assessments performed by Reclamation (2012; 2016; 2017a-g), prepare site-specific plans with a focus on areas that monitoring efforts determine are a priority.

Planning Constraints

Project constraints are resource, legal, or policy considerations that limit the range or type of actions that could be implemented to meet planning objectives. The following constraint was identified for this evaluation:

- Comply with federal, state, and local laws, and regulations and policies.
- Implement the program consistent with the authorizing legislation and guidance.
- Avoid adverse effects to threatened and endangered species.

3.4 MEASURES

Sections 3.4 through 3.7 show potential improvements and expansions of the current operations through a federal partnership. This evaluation does not attempt to precisely define the future program. Optimization will occur annually at the regional level. Instead of attempting to define an optimal set of conditions, this report assumes that

providing federal funding to assist the state programs across the region will result in an increase in the investment and effectiveness of the overall program and a decrease in the risk of infestations. The measures discussed below were developed in cooperation with state AIS coordinators.

Measure 1 – Federal Participation in the Process to Strategically Select and Prioritize Locations to Establish Watercraft Inspection Stations in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

This measure would augment the future program by allowing USACE to participate in the process used to select locations to establish watercraft inspection stations to reduce the risk of dreissenids being introduced into Waters of the U.S. in the UMRB (see Section 2.2, Existing Watercraft Inspection Stations in the Upper Missouri River Basin, for further description).

Measure 2 – Increase the Number of Watercraft Inspection Stations in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

This measure would augment the future program by increasing the number of watercraft inspection stations in the program to reduce the risk of dreissenids being introduced into Waters of the U.S. in the UMRB. The type of inspection locations would be roadside, rampside, and roving (see Section 2.2.1, Types and Operations, for further description). New inspection locations would be established, depending on the availability of federal funding and each state's need to increase program effectiveness and its ability to share in the associated costs.

Measure 3 – Extend Daylight Inspection Hours to the Watercraft Inspection Program in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

This measure would augment the future program by extending daylight inspection hours to reduce the risk of dreissenids being introduced into Waters of the U.S. in the UMRB. Daylight inspection hours would be expanded based on each state's need to increase program effectiveness and its ability to share in the associated costs.

Measure 4 – Increase Nighttime Watercraft Inspections in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

This measure would augment the future program by adding or increasing the number of nighttime inspections that are performed. In 2015, Washington State Department of Fish and Wildlife (WDFW) implemented nighttime operations, from 10 p.m. to 6 a.m., through a grant from PSMFC and Bonneville Power Administration. Nighttime operations were conducted on six different occasions in August in Plymouth, Ridgefield, and Spokane, Washington. During this pilot program, 182 boats were inspected.

Although no dreissenids were found during these inspections, two boats originated from waters infested with dreissenids. A majority of the boats (~70%) were stopped between 3 a.m. and 6 a.m. (WDFW and PSMFC 2015). The effectiveness of nighttime

inspection stations is dependent on the location of the inspection station and major events in the area. This pilot program proved there can be a significant amount of nighttime watercraft transportation occurring within and outside a basin. The pilot program indicated a potential for boats originating from infested waters to enter the basin at night. Establishing nighttime operations at consistent locations could further reduce the risk of a dreissenid introduction in Waters of the U.S. in the UMRB. Night operations are not typically conducted without the presence of law enforcement, due to the need to ensure the safety of watercraft inspection personnel and the public. Law enforcement personnel can significantly increase the cost of station operations, and they are not always available. In some locations, law enforcement agencies either do not patrol after 10 p.m. or reduce their nighttime patrols, which limits their availability to assist with watercraft inspection stations. The ability to hire inspectors for night operations could also present a challenge, especially in more remote areas where recruiting daytime inspectors has been challenging. Another challenge is that the lack of effective lighting at night can limit the inspector's ability to accurately conduct inspections.

Nighttime inspections would be added depending on the availability of federal funding and each state's need to increase program effectiveness and its ability to share in the associated costs. If a federal partnership is established, the nighttime operations could be phased in as states establish agreements with law enforcement and as inspection personnel are hired and trained. The nighttime inspection locations and nighttime shift durations would be further developed based on the regional strategy.

Measure 5 – Construct Site Improvements at Watercraft Inspection Locations in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

This measure would augment the future program by helping to construct site improvements such as, but not limited to, utility connections and pavement.

Installing utilities at watercraft inspection stations provides several benefits, including lighting for expanded hours of operation, electricity without the need for portable generators, and increased reliability of systems that require electricity, such as data input and real-time communications. Utility connections would be implemented depending on the availability of federal funding and each state's need to increase program effectiveness and its ability to share in the associated costs.

Paving and otherwise developing site conditions at watercraft inspection stations has the potential to increase the efficiency and effectiveness of the existing inspection stations. Hardening the stations by adding pavement (concrete or asphalt) or gravel would provide additional safety buffers and ease ingress and egress at the inspection stations. Site improvements would be implemented depending on the availability of federal funding and each state's need to increase program effectiveness and its ability to share in the associated costs.

Providing electrical hookups and constructing trailer pads would have the added benefit in remote areas of attracting potential watercraft inspectors requiring living quarters. Inspectors could either bring their own trailers, or trailers could be provided.

The details of site improvements would be developed after the federal partnership is established. When improvements are planned at an inspection station location that involves any ground disturbance, USACE may need to tier from this LR/Programmatic EA and complete site-specific NEPA analysis, depending on the nature and magnitude of proposed work and associated impacts.

Measure 6 – Add Canine Detection Capabilities to the Existing Watercraft Inspection Program in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

For states that determine nighttime inspections are feasible and effective in certain areas, the use of canines can assist with the challenge of inadequate lighting. Dogs can use their keen sense of smell to detect dreissenids without light, and they have been shown to be more effective than human inspectors. Both the Canadian Province of Alberta and the state of California have trained dogs to successfully locate dreissenids at watercraft inspection stations and have demonstrated substantial results through their K-9 programs. Montana has also collaborated with Alberta in training dogs for use in some of their watercraft inspection stations. This measure would augment the future program by increasing canine detection capabilities and would be implemented depending on the availability of federal funding and each state's needs to increase program effectiveness and its ability to share in the associated costs.

Measure 7 – Increase Public Awareness and Education Related to the Existing Watercraft Inspection Program in the States of Montana, Wyoming, North Dakota, South Dakota, and Nebraska

This measure would augment the future program by increasing public awareness and education efforts, which could include ad campaigns; communication with commercial boat haulers, marinas, etc.; and the addition of permanent signs at locations where inspection stations are routinely established each year (such as at points of entry along interstates and major highways). Informing the public of the risks of AIS can increase their involvement in prevention efforts and potentially decrease the numbers of infested boats that enter the UMRB. Increasing public awareness and education efforts would be implemented depending on the availability of federal funding and each state's needs to increase program effectiveness and its ability to share in the associated costs.

Measure 8 – Require Watercraft Inspections at Federal Facilities at Infested Lakes

This measure would require that watercraft leaving infested water bodies (e.g., Great Lakes in the Midwest, Mississippi River Basin, and multiple federal lakes in the southwest) be inspected and decontaminated.

Measure 9 – Monitor to Identify UMRB Water Chemistry and Compare to Water Chemistry of Infested Water Bodies

This measure would augment the future program by identifying water chemistry of the UMRB for comparison to the water chemistry of infested water bodies to help inform early monitoring locations and risk management decisions within the UMRB. Dreissenids acclimated to the water chemistry of a particular water body may become established in the UMRB more easily than those established in a different water body. Using these monitoring results, USACE would develop a risk assessment matrix of infested water bodies of similar water chemistry to the UMRB in order to determine the risk of those dreissenid populations becoming established in the UMRB.

Measure 10 – Monitor for Early Detection

This measure would augment the future program by leveraging both states and USACE efforts to engage in monitoring activities for early detection of veligers in the states of Montana, North Dakota, South Dakota, Wyoming, and Nebraska, with a focus on protecting the UMRB. These efforts would focus on locations determined by the water chemistry data to be of highest risk and locations that state collection data indicate are high-use areas by boaters travelling from water bodies of concern.

Monitoring activities provide an additional level of defense in the event prevention measures fail and live mussels invade a water body in the UMRB. Early detection monitoring and having appropriate response plans in place increase the chances of initiating an effective response before widespread establishment occurs.

Water quality measurements, environmental DNA (eDNA), and Petite Ponar grab sampler are some indirect methods of monitoring for Dreissenid mussels. Sets of water quality measurements consisting of calcium, temperature, salinity, pH, dissolved oxygen, and visibility are conducted at each site to help identify the highest-risk water bodies and the times of year that water bodies are at greatest risk of a viable introduction. Monitoring for eDNA would require two liters of lake water to be collected at sample sites. Environmental DNA analysis would then be performed in a lab following rigorous quality control protocol developed by the Asian Carp Monitoring Program's Quality Assurance Project Plan, both in the field and laboratory, to ensure samples are not contaminated (USFWS 2015). Benthic samples would be collected using a petite Ponar grab sampler at each site from a watercraft for the presence of Dreissenid mussels during their post-veliger life history stage (post settlement to adults).

Section 104 of the RHA, as amended, provided authority to conduct fish tissue sampling, however dreissenids do not require a host fish during their larval development, and therefore fish tissue samples are not included as part of the proposed action.

Measure 11 – Regional WID Data Sharing System

This measure would encourage participating agencies to use the Regional WID Data Sharing System to document inspections and share data with other agencies throughout the Western United States.

Colorado Parks and Wildlife developed the System[1] to record WID information electronically and share information in a timely manner across jurisdictions to aid collaborative efforts to prevent the spread of zebra and quagga mussels and other AIS. The System consists of a website, shared database, and phone app for iOS and Android devices. The System reduces operating costs for mobile data collection while increasing accuracy and reliability, and it can be queried for on-demand reporting. The System includes a risk assessment tool shows where boats are moving after launching in mussel-infested waters and sends an alert to the next known destination. With the benefits of data sharing proving to be abundant, the states of Arizona, Nevada and Utah have been using the System to send out timely electronic alerts of watercraft leaving infested waters. This increased timely communication has directly increased the number of infested watercraft being intercepted within the western region before launching in uninfested waters.

Measure 12 – Develop and Implement Real-time Tracking of Watercraft Transportation

This measure would support the program through future development of a real-time tracking system by the states for watercraft traveling between lakes across the region, both within and outside the UMRB. The system would direct boaters toward inspection and cleaning stations to decrease the risk of introduction of invasive species into uninfested waters.

Measure 13 – Evaluate Traffic Patterns for Recreational Boating

This measure would support the future program by periodically funding regional traffic studies for identifying highway use patterns by the boating public traveling between lakes within and outside the UMRB. Understanding movement patterns of boaters would identify effective locations for permanent or roving inspection stations, support public awareness and education campaigns, and provide information for contingency and rapid response planning.

Measure 14 – Contingency Planning

This measure would augment the future program by helping to develop site-specific plans at USACE and other federal facilities, based on the facility vulnerability assessments conducted by Reclamation (2012; 2016; 2017a-g) (see Section 3.1 for information about vulnerability assessments).

Measure 15 – Rapid Response Planning

This measure would augment the future program by helping to develop rapid response measures at USACE and other Waters of the U.S. to find and eradicate dreissenids before they further spread and cause damage (see Section 2.5 for further information).

Preventing the introduction of invasive species is the first line of defense against biological invasion (Draheim et al. 2017; PSFMC 2019). However, for invasive species that circumvent prevention systems, early detection, and rapid response—a coordinated set of actions to find and eradicate potential invasive species before they spread and cause harm—can help stop the next lionfish, cheatgrass, or Asian carp (DOI 2016).

Where monitoring detects the presence of dreissenids, rapid response is the next most cost-effective management tool to quickly eliminate or minimize infestation impacts (Reclamation 2010). Rapid response measures include prevention, containment, control, eradication, enforcement, and education/training and outreach actions. Interagency (federal, state, local) exercises are essential for testing the strengths and identifying the weaknesses of rapid response plans. USACE, in collaboration with the five study area states, must be prepared to quickly respond to contain and limit any infestation in the entire water system in the UMRB.

3.5 OBJECTIVES AND MEASURES

Error! Reference source not found. lists the measures identified for this report and the individual objectives to which they contribute.

Table 9. Screening Measures by Objectives

Measures	Intercept Watercraft	Water Chemistry	Rapid Response	Contingency Planning
Measure 1 – Federal Participation in Selection of Watercraft Inspection Station Locations	X			
Measure 2 – Increase Watercraft Inspection Stations	X			
Measure 3 – Extend Daylight Inspection Hours	X			
Measure 4 – Increase Nighttime Inspections	X			
Measure 5 – Construct Site Improvements	X			
Measure 6 – Add Canine Detection	X			
Measure 7 – Increase Public Awareness and Education	X			
Measure 8 – Require Watercraft Inspections at Federal Facilities at Infested Lakes	X			
Measure 9 – Monitor to Identify Water Chemistry		X		X
Measure 10 – Monitor for Early Detection		X	X	
Measure 11 – Regional WID Data Sharing System	X		X	
Measure 12 – Develop and Implement Real-time Tracking of Watercraft Transportation	X		X	
Measure 13 – Evaluate Traffic Patterns for Recreational Boating	X			X
Measure 14 – Contingency Planning				X
Measure 15 – Rapid Response Planning			X	

The measures were screened to determine which met the identified objectives without violating any identified study constraints. Measure 8, Requirement of Watercraft Inspections at Infested Federal Lakes, was eliminated from further consideration due to the geographical limitations of Section 104 of RHA. Currently, USACE does have not the authority to execute Measure 8. All other measures were carried forward for consideration (alone or in combination) as shown in **Error! Reference source not found.** below.

Table 10. Measure Screening

Measures	Consistent with Authorizing Legislation (Sec. 104 RHA)	Avoid Effects Threatened and Endangered Species	Comply with Federal, State, local laws, regulation, and policies	Retained
Measure 1 – Federal Participation in Selection of Watercraft Inspection Station Locations	Yes	Yes	Yes	Yes
Measure 2 – Increase Watercraft Inspection Stations	Yes	Yes	Yes	Yes
Measure 3 – Extend Daylight Inspection Hours	Yes	Yes	Yes	Yes
Measure 4 – Increase Nighttime Inspections	Yes	Yes	Yes	Yes
Measure 5 – Construct Site Improvements	Yes	Yes	Yes	Yes
Measure 6 – Add Canine Detection	Yes	Yes	Yes	Yes
Measure 7 – Increase Public Awareness and Education	Yes	Yes	Yes	Yes
Measure 8 – Require Watercraft Inspections at Federal Facilities at Infested Lakes	No	Yes	Yes	No
Measure 9 – Monitor to Identify Water Chemistry	Yes	Yes	Yes	Yes
Measure 10 – Monitor for Early Detection	Yes	Yes	Yes	Yes
Measure 11 – Regional WID Data Sharing System	Yes	Yes	Yes	Yes
Measure 12 – Develop and Implement Real-time Tracking of Watercraft Transportation	Yes	Yes	Yes	Yes
Measure 13 – Evaluate Traffic Patterns for Recreational Boating	Yes	Yes	Yes	Yes
Measure 14 – Contingency Planning	Yes	Yes	Yes	Yes
Measure 15 – Rapid Response Planning	Yes	Yes	Yes	Yes

3.6 ALTERNATIVES

3.6.1 Alternative 1, Existing Conditions (No Action Alternative)

Alternative 1 represents a continuation of the states' current practice, in which USACE would not partner with the states to establish watercraft inspection stations to prevent

the spread of AIS into and out of Waters of the U.S. within the UMRB (see Section 2.2 for a description). Although the No Action Alternative does not meet the Purpose and Need Statement, it will be carried forward for further consideration and evaluation as required by NEPA for a baseline from which to compare other alternatives.

3.6.2 Alternative 2, Comprehensive Adaptive Improvements

Alternative 2, Comprehensive Adaptive Improvements, is made up of all measures identified in Section 3.5 that meet the study objectives without violating any planning constraints. This alternative assumes USACE would partner with the states and their agencies using federal funding to expand and support existing state programs, resulting in increased effectiveness in the watercraft inspection program to decrease the vulnerability of a dreissenid infestation. In coordination with their regional partners, the states would use the data gathered during the inspection season to develop a strategy and adjust the program to provide a more effective regional defense. The states would continue to implement existing quality assurance and quality control (QA/QC) protocols in their inspection station programs, and revise or adapt QA/QC protocols towards improved station efficacy during periods of strategy development; for example, partnering with local interest groups or Universities to evaluate accuracy in following station protocols. The Comprehensive Adaptive Improvements alternative also includes monitoring, contingency planning, and rapid response planning for USACE facilities and reservoirs. These actions are not currently eligible for cost-sharing. The measures in Alternative 2 are listed in Table 11.

Table 11. Measures Included in Alternative 2

Measures	Cost-Share 50% Federal / 50% Non-Federal
Measure 1 – Federal Participation in Selection of Watercraft Inspection Station Locations	X
Measure 2 – Increase Watercraft Inspection Stations	X
Measure 3 – Extend Daylight Inspection Hours	X
Measure 4 – Increase Nighttime Inspections	X
Measure 5 – Construct Site Improvements	X
Measure 6 – Add Canine Detection	X
Measure 7 – Increase Public Awareness and Education	X
Measure 9 – Monitor to Identify Water Chemistry	X
Measure 10– Monitor for Early Detection	X
Measure 11 – Regional WID Data Sharing System	X
Measure 12 – Develop and Implement Real-time Tracking of Watercraft Transportation	X
Measure 13 – Evaluate Traffic Patterns for Recreational Boating	X
Measure 14 – Contingency Planning	X
Measure 15 – Rapid Response Planning	X

Under the future program, each of the measures identified in Table 11 would be adjusted annually by each state based on its need and ability to fund its portion of the program, the results of the regional coordination effort, and the availability of federal funding. Over time, the locations of stations and the nature and timing of their operations may change significantly as the states continue to refine and optimize the program's overall effectiveness.

For this LR/Programmatic EA, Section 104 of the RHA of 1958, as amended, serves as a guide for determining the range of alternatives to be considered. When an action is taken pursuant to a specific statute, the statutory objectives of the project serve as a guide by which to determine the reasonableness of objectives outlined in the NEPA document. This LR/Programmatic EA is being prepared to determine if there is a federal interest in establishing or maintaining watercraft inspection stations in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska to protect the UMRB from the spread of aquatic invasive species. This alternatives analysis, therefore, focuses on identification of measures/alternatives that can be implemented under such a program.

NEPA does not require an agency to consider all alternatives; rather, only "reasonable alternatives" need to be explored and objectively evaluated. As such, USACE initially considered four alternatives, but screened them until only the "No Action" alternative and Alternative 2 (Comprehensive Adaptive Improvements), which is made up of all measures identified in Section 3.4 that meet the study purpose and need statement and objectives without violating any planning constraints, remained. Alternatives containing discrete subsets of measures would not be holistically applicable to the UMRB and would not satisfy the purpose and need of the action. Therefore, Alternative 2, Comprehensive Adaptive Improvements, was carried forward for further consideration and evaluation. This alternative includes the broad list of measures with the flexibility to address the varying and unique regional/local scenarios for watercraft inspection.

It is important to note that the "No Action" alternative is the result of a decade of iterative planning on the part of the states, as they each developed their own watercraft inspection station programs and grew to work together towards a regional strategy. A number of the measures listed above have been considered and/or implemented to greater or lesser extents, with different timing, locations, and scale, and subject to the constraint of available funding. Absent federal partnership, the states would continue to refine their watercraft inspection station programs, with the scale and components of those programs evolving from year to year.

Similarly, while Alternative 2 provides for comprehensive improvements subject to the constraint of available funding, it is more a framework for an annual adaptive planning process, with input provided by USACE. The measures listed are ones that were developed and analyzed through prior experience by the states. It would be possible to construct alternatives that included the listed measures separately, or in various combinations other than the final combination presented here, but they would not present a complete solution for all jurisdictions in the basin.

3.6.3 Alternatives Considered but Eliminated

USACE briefly considered, but ultimately screened out an alternative (Alternative 3) that was similar to Alternative 2, but with a smaller scale with fewer measures. Alternative 3 did not include Measure 4 (increasing nighttime inspections) or Measure 6 (adding canine detection). As mentioned elsewhere in this report, nighttime inspections entail higher costs than daytime inspections because of the necessity of securing law enforcement personnel. Canine detection also requires specially trained personnel, and while having a long history of use in drug interdiction efforts, is a relatively new tool for enhancing the effectiveness of watercraft inspection stations. Because of the increased cost associated with these measures, Alternative 3 was screened out because it failed to address the significant and documented concern that a high number watercraft could be transported within the basin at night, a concern that these two measures directly addressed: the first by having inspection stations open at night, and the second by making these stations more effective, due to the canine ability to detect the presence of mussels without the need for light. USACE determined that Alternative 3 would not effectively address a significant percentage of the watercraft that could potentially be bringing aquatic invasive species into the UMRB, therefore it was eliminated from further consideration and evaluation.

A fourth alternative (Alternative 4) that was briefly considered focused on locating new watercraft inspection stations at USACE reservoirs, and to have USACE employees or staff contracted by USACE operate and maintain them. However, Alternative 4 was eliminated from further consideration very early in the process because it was determined that locating these stations at USACE reservoirs did not provide the highest likelihood of preventing the spread of AIS into and out of Waters of the U.S.. As previously mentioned, the states have refined their station location selection process yearly, based on previous years' experience and data tracking. An important part of their selection process is to determine not only where boat traffic is most prevalent, but also where boats originate. Their focus is on a more efficient regional strategy which aims to intercept fouled boats before they have the opportunity to reach the UMRB. USACE and the states share a common goal of keeping the UMRB free from an infestation, which would result in high financial and environmental costs to federal and state interests.

SECTION 4 - ECONOMIC AND ECOSYSTEM CONSIDERATIONS

The Upper Missouri watershed is largely uninfested by dreissenids (specifically, zebra and quagga mussels) in the states of Wyoming, Montana, North Dakota, South Dakota, and Nebraska. There is a nation-wide and regional effort to reduce the economic damages and impacts that would result from dreissenids moving into the Platte and Upper Missouri Basins. The expansion of dreissenid populations from the Great Lakes, Lower Colorado River Basin, and the Lower Missouri River/Mississippi River Basin to other parts of the United States and the human-assisted pathways that exist between nearby infested waters present a risk of a dreissenid infestation in this area. Based on that risk, this report assumes that an infestation will occur at some point in the future and that the risk-reduction efforts described in the previous sections would lower the overall risks, thus delaying future infestations. It further assumes that investments in watercraft inspection stations would be re-evaluated and adjusted if a major infestation occurs. The Platte and Upper Missouri Basins have so far been untouched by dreissenid infestations. This means that there have not yet been any infestations in the Upper Missouri/Platte River Basins at the time of this report. The Upper Missouri Basin watercraft inspection expansion will focus on risk and damage reduction, and also aim to limit the spread of dreissenids to the uninfested parts of the watershed.

Values in the economic analysis are based on fiscal year (FY) 2023 price levels and the FY 2023 federal discount rate of 2.5 percent unless otherwise noted. Annualized benefits and costs are computed using a 50-year period of analysis.

This section evaluates the costs and benefits of the proposed action to address the economic elements of the Federal Objective. As stated in the Economic and Environmental Principles for Water and Related Land Resources Implementation Studies (U.S. Water Resources Council 1983), the Federal Objective is, “to contribute to national economic development while protecting the nation’s environment.” For there to be federal interest, the benefits must exceed the costs. These analyses rely on the policy and guidance published in Engineer Regulation 1130-2-500[2] (USACE 1996).

4.1 ECONOMIC CONSIDERATIONS

4.1.1 Infestation Impacts

The economic benefits and costs calculations in this section are intended to present the most recent information regarding dreissenids, potentially impacted infrastructure, and associated economic activities and business lines. The study extent for this report includes thousands of miles of river in the UMRB. Because of time and other constraints (budget, data availability, interstate data comparability), the information

[2] Project Operations Partners and Support (Work Management Policies): “…establishes the policy for the management of operation and maintenance activities of U.S. Army Corps of Engineers personnel performing civil works functions related to flood control, navigation, dredging, hydroelectric power generation, environmental stewardship, and recreation services at water resource, waterway, and other USACE projects…”

collected will not be a representation of every possible economic cost that could come as a result of a dreissenid infestation. This section monetizes large-level impacts to water-related resources in the study area.

The associated impact estimates are based on current available data related to additional O&M costs. Additional O&M costs are defined as "the increased annual cost incurred to maintain current levels of performance in an infested watershed." These costs include accelerated cleaning schedules involving clearing any potential fouled piping, anti-fouling chemical applications, and other routine maintenance schedules impacted by the invasive species.

Estimates for benefits were derived from several academic studies as well as previous USACE reports, including the Columbia River Basin watercraft inspection report, which addressed stations in Oregon, Washington, Idaho, Montana, Nevada, and Wyoming (USACE, NWW 2020). Benefits calculations were also calculated using A Cost-Benefits Analysis of Preventative Management for Zebra and Quagga Mussels in the Colorado-Big Thompson System (Thomas, 2010), Idaho Aquatic Nuisance Species Taskforce's report (2009), BPA's Zebra Mussel Response Plan (Athearn and Darland 2007), and the Economic Risk of Zebra and Quagga Mussels in the Columbia River Basin report (IEAB 2013). Many other government and non-government sources were used to find counts and data for the infrastructure on the Upper Missouri Basin.

Price levels were escalated from their initial studies using EM 1110-2-1304 Composite Yearly Cost Indices dated 30 September 2022. EM 1110-2-1304 was used because its purpose is for use in escalating USACE Civil Works (CW) project costs and applies to all USACE commands having CW design cost responsibilities. The Yearly Cost Indices are used instead of Quarterly Cost Indices because the months of the original price level are unknown via the initial studies.

Hydropower Facilities and Flood Control

The Arizona Game and Fish Department has estimated that, "zebra mussels alone cost the power industry $3,100,000,000 in the 1993-1999 period, with their impact on industries, businesses, and communities more than $5,000,000,000" (AZGFD 2016). Many of the important components of the hydropower system are at risk of being damaged due to dreissenid infestation in their impounded water bodies. The systems that are the most vulnerable to impacts are the raw water systems, instrumentation, and flood management infrastructure. The raw water systems are used to provide water for cooling and fire suppression purposes and could be clogged, resulting in a complete powerhouse shutdown. Flood control infrastructure such as emergency spillway gates, stoplogs, and flap gates are not only susceptible to an infestation, but they may be difficult to inspect. If a gate or stoplog is fouled and will not operate, high river stage flood waters could enter protected areas. Various hydropower facility pools supply water to the local area for municipal use, fish hatcheries, irrigation, and other requirements, which could all be impacted.

Cost estimates referenced by a BPA-commissioned study indicate that an expected average annual cost for additional O&M implementation could be as high as $100,000 per facility (Phillips et al. 2005). Although the estimates were derived from the adjacent Columbia River Basin facilities and not directly from UMRB facilities, it is reasonable to anticipate similarities among the basins. These costs represent recurring fees expected for labor and capital requirements involved in anti-fouling paint applications and parts replacement for all susceptible systems. Additionally, maintenance schedules for pipe and intake cleaning are likely to be increased due to the threat of fouling. Using the Willet 2010 study, hydropower facilities will have to incur one-time costs at the beginning of an infestation in order to retrofit to better handle an infestation onset.

These one-time costs are estimated to be $1,804 per megawatt of hydropower generation. Using the Philips et al. (2005) study, and sampling costs for hydropower facilities, the 2023 yearly cost per megawatt is $1,935. The total one-time retrofits would cost FY23 $4,840,000 as outlines in Table 12, Megawatts by Dam.

There are six mainstem dams within the Upper Missouri River Basin that may be affected. The 2005 $1,859 yearly megawatt cost translates into a 2023 cost of $1,994. The mainstem Missouri River dams generate around 2,500 megawatts per year. Multiplying the anticipated 2023 yearly megawatt cost of $1,994 by the 2,500 megawatts generated by the UMRB dams results in the cost $4,980,000 to clean and inspect these power plants in the case of a dreissenid infestation per year. This estimate is in addition to the one-time retrofitting that must occur at each power station at the onset of the infestation that has been included in the cost estimate.

Table 12. Megawatts by Dam

	Gavins Point	Ft. Randall	Big Bend	Oahe	Garrison	Ft. Peck	UMRB Total
Megawatts	132	320	493	786	583	185	2,500
Reservoir Surface Size (acres)	31,000	102,000	56,000	370,000	307,000	245,000	1,110,000
One-time Retrofits (2023)	$256,000	$620,000	$954,000	$1,521,000	$1,130,000	$358,000	$4,840,000
Yearly Benefits (2023)	$264,000	$638,000	$983,000	$1,567,000	$1,163,000	$369,000	$4,980,000

Hatcheries

Fish hatcheries are also at risk for incurring dreissenid-related costs. One of the biggest impacts to hatcheries would be the clogging of surface water supply systems. O'Neill's (1997) base costs estimates were escalated to present dollars, and these new estimates indicate that hatcheries may be forced to spend, on average, $15,000 per year in the event of an infestation. There are 8 publicly owned hatcheries in the Upper

Missouri Basin, and the total yearly cost in the event of an infestation is approximately $120,000.

Water Supply and Treatment Facilities

Many studies, including those cited in the Columbia River Basin watercraft inspection report, calculate the cost to clean water pumping facilities using a per-gallon cost for different sized pumping systems. The Thomas (2010) study cited the New York Sea Grant and National Zebra Mussel Information Clearinghouse Study (O'Neill 1997) that surveyed power plants and water drinking facilities. Their results indicated that the costliest control measures that dominated the average repairs were bleach injectors and anti-fouling paint. They estimate that the average cost per facility per year is approximately $30,000 in 2004 dollars. Using Reclamation's most recent data on the estimated number of water-treatment facilities, as well as information from local websites, there are around 1,600 water intake stations in the basin. Using the 2023 cost of $67,000 per year per station, it would result in a total yearly cost of $107,000,000 in the 2023 Price Level.

Boats and Marine Infrastructure

Dreissenid infestation represents a serious cost for boaters and requires time and money once the boat has been put in infested waters and mussels become attached to the hull, propeller, or motor of a boat. Rogers (2008) suggests, "without regular maintenance to brush away the fingernail-sized mussels, colonies can build up on the hull and in the cooling water intake of outdrives," which could result in "serious safety problems caused by drag on the boat and lack of cooling water," Research from Lake Erie suggests that per-boat costs were $265 in 1994 (Vilaplana and Hushak 1994). When these costs are escalated to 2023 dollars, the cost becomes $724 per boat.

Boat counts were estimated using state title counts for the number of boats in each state. The number of boats for each state used in the benefits estimation was calculated by taking the population in the counties adjacent to the river and then dividing that by the state population to get the percentage of people living near the river. That percentage multiplied by the number of boats in each state is the number of boats within a very close distance to the river. While there are likely many boaters from out-of-state that travel to use the large reservoirs on the Missouri for recreation, very few formal counts are recorded. By using precedent from previous studies such as the Thomas report (2010), the number of boats in adjacent counties is an accurate proxy for the number of boats that will be placed in the river in a given year. In order for a boat to be infested, it only needs to be in the infested waters once; however, longer duration and more trips increases the likelihood of an infestation. Using data from the Big Thompson report, as well as reporting from the USACE Districts on the Great Lakes, for this estimate, it assumed there is an 80 percent chance that a boat in a county adjacent to the basin will be put into the watershed a 90 percent chance of the boat becoming infested if it is put in infested waters.

The total number of boats for Upper Missouri Basin is estimated to be 60,700. When multiplying this by the average yearly cost the boater will incur from an infestation, the average annual cost becomes approximately $31,700,000.

Boat Ramps and Marinas

Boating facilities on the lakes and rivers in the Upper Missouri/Platte Basin will also face costs associated with a dreissenid infestation. Using estimates from Thomas (2010) and other reports like the 1995 New York Sea Grant and National Zebra Mussel Information Clearinghouse Study (O'Neill 1997), the cost per boating facility in 2023 dollars will be $1,536. There are approximately 288 boat ramps on the Platte and Upper Missouri Basins resulting in a total yearly cost of $442,000. There are also 20 commercial marinas on the Upper Missouri Basin that would require similar cleaning activities, which would result in $31,000 of related costs per year. The cost for commercial marinas is not different from other boat ramps, as cleaning costs for the dock and pylons is the same.

Cost of Watercraft Inspection Implementation

The costs for watercraft inspections are self-reported from the states in the Basin: Wyoming, Nebraska, Montana, North Dakota, and South Dakota. The population in the Upper Missouri Basin includes towns such as Pierre, SD; Bismarck, ND; and Helena, MT.

Due to the highly uncertain nature of how fast dreissenids reproduce and populate watersheds, the differing chemical compositions of watershed regions, and changing methodology, a 50 percent contingency was added[3] to account for any conceivable changes. Because dreissenid infestations can occur rapidly, extra resources that have not been accounted for may need to be included to focus effort on a specific geographical region. (See Quagga-Zebra Mussel Action Plan for Western U.S. Waters [WRP 2010] for further reading). The total cost for the study area is $7,249,775, as shown in Table 13.

Table 13. Annual Watercraft Inspection Station Costs

State	Cost to Implement	Cost With 50% Contingencies
Nebraska	$297,000	$445,000
N. Dakota	$456,000	$684,000
S. Dakota	$2,300,000	$3,440,000
Montana	$886,000	$1,330,000
Wyoming	$903,000	$1,360,000
Total	**$4,840,000**	**$7,250,000**

[3] A 50% contingency was added upon review of the Idaho Watercraft Inspection rollout, and the costs associated with the program implementation.

Qualitative Effects

While many of the impacts on the resources in Upper Missouri and Platte River Basins have quantitative impacts that can show damages in terms of a decrease in the National Economic Development (NED), a dreissenid infestation can cause numerous other impacts that cannot be easily shown as a cost. Many of the impacts are related to passive use and recreation damages. Passive use is an economic term that describes the value people receive from something when they are not using the resource in a monetary way. In the Upper Missouri, passive use benefits come from viewing a clean watershed that has not been visually damaged from a dreissenid infestation. Many people hike and walk along the lakes and rivers that make up this watershed and enjoy the current and natural condition of the water. A dreissenid infestation would hurt native fish and plant species that currently reside in the water, thereby reducing the benefit many people receive from this watershed.

Anglers could also see a decrease in the number and size of fish they catch in dreissenid-infested waters. Dreissenids compete with both fish and aquatic plants for food and minerals, which often results in decreased native fish populations. This would reduce the benefit that anglers receive from fishing, and they may choose not to travel to this watershed, which is famous for fly fishing. The effects of a dreissenid infestation on fishing is not well-studied and could have varying levels of impact between basins. There is also a large uncertainty in the number of anglers in a given area, as well as the change in their benefits due to a decrease in the native fish population.

Benefit Calculation

The total yearly benefits (or costs now avoided by the implementation of inspections) calculation for the watercraft inspection implementation plan is $106,785,362, excluding the one-time hydropower retrofits (Table 14). The one-time retrofits will be performed at the onset of infestation.

Table 14. Average Annual O&M Costs of a Total Infestation

Benefit Category	Cost/Year
Hydropower	$4,980,000
Hatcheries	$120,000
Water Intakes	$107,000,000
Boat Counts	$31,700,000
Boat Ramps	$442,000
Marinas	$31,000
Total	$107,000,000

The total benefits of the implementation of watercraft inspections in the Upper Missouri Basin utilizes the 2.50 percent Federal Discount Rate for the year 2023. The study period length is 50 years. While the goal of the watercraft inspections in the basin is to prevent the infestation of dreissenids entirely, there is a possibility that it only prevents

an infestation for a few years from the plan's inception. In order to account for these uncertainties and risks, economic modeling was performed assuming different years of future onset. For the final total benefit figure, it was assumed that the watercraft inspections could stave off a dreissenid infestation for at least 25 years from the project's inception. A 25-year assumption is based on biological rates of infestation from the Thomas (2010) study, as well success rates of the states' program implementation. In some areas, watercraft inspection stations are highly effective; the Idaho Invasive Species Law of 2008 enabled the Idaho State Department of Agriculture to run state-wide inspection and prevention programs. These programs have shown to successfully intercept infested watercraft and points to a direct decrease in risk for watersheds within the state (Quagga-Zebra Mussel Action Plan for Western U.S. Waters [WRP 2010]). However, the success of these programs and inspections cannot be guaranteed, as there are thousands of watercraft that travel across the country every week. Inspection stations and targeted risk reduction can only reduce a portion of the long-term risk that dreissenid infestations pose to the Upper Missouri.

The calculation of benefits assumes all benefit categories (annual costs avoided via hydropower, hatcheries, water intakes, etc) occur at the same time. There are two key reasons for inclusion of an instantaneous infection (less than or equal to one year's time) across a watershed. The first is the possibility, without mitigation efforts, that multiple infested watercraft could be placed in the waterways in the same year, leading to an infestation of aquatic invasive species that spread from multiple vectors. This was deemed to be a reasonable assumption based on watershed managers' and USACE biologists' expertise. Second, it would be difficult to determine what portion of the watershed an infestation of aquatic invasive species may occur in. Because an infestation could occur from the most remote portion or the most populated (where a majority of the affected facilities are) portion of the region, it could spread slower or faster than the one-year time frame while regardless, the majority of the basin has the ability to get infected. If it is adult (breading) introduction of infestation, it is constant introduction until water temperature and other breading factors are no longer conducive to veliger production. Adult introduction could lead to a large window in which veliger spread can inhabit, spread, and establish in the system. This could be multiple events and locations within a year, leading to the lost benefits categories all occurring in one year as a large portion or majority of the system can be impacted. Furthermore, while the relevant facilities may not all be infected at once, it is reasonable to assume they would take precautionary measures. Because the lost benefits are measured in terms of cleaning costs, the 10-year ramp-up period where the cleaning costs are slowly applied can be viewed as the beginning of precautionary cleanings to infrastructure in preparation for a full infestation of aquatic invasive species. Preventative measures include costs to operations that reduce and keep veligars out as well as reduce adult establishment, creating overlap between prevention and cleaning costs that typically occur simultaneously.

Table 15 shows a sensitivity analysis of the avoided costs associated with a 10-year delay in infestation versus longer infestation delays because of the program.

Table 15. Avoided Costs Associated with Differing Levels of Delay in Infestation

Benefits	No Infestation Delay	10-Year Infestation Delay	25-Year Infestation Delay	50-Year Infestation Delay
Average Annual Benefits	**$0**	**$36,400,000**	**$81,600,000**	**$123,100,000**
Total Benefits	**$0**	**$1,031,000,000**	**$2,313,000,000**	**$3,492,000,000**

The costs represented in the benefit category would begin to occur after year 25. It is unlikely that the costs would reach the 100 percent full infestation figure in the first year, and it would take some time for the infestation to spread. Therefore, it was assumed that the one-time hydropower retrofits would occur in year one, while the yearly total costs would increase from 10 percent in year one to 100 percent in year ten.

The total benefit for the 25-year protection is calculated by summing the present values of the 25-year onset subtracted from the sum of the no-protection option, which assumes that the onset starts in year zero—which is what would occur in the absence of any watercraft inspection program in the Missouri Basin.

The average annual benefits per delay scenario are calculated as the difference between the no infestation scenario yearly benefits and the individual infestation delay scenario yearly benefits. Where the yearly benefits per delay scenario are computed by summing the present values per delay scenario and multiplying the resulting summed figure by a capital recovery rate of 0.03526.

Benefit Cost Analysis

The current benefit-cost ratio (BCR) range for the Upper Missouri is between 2.11 and 7.14 for the different sensitivities, which is above the 1.0 threshold needed to federally justify the implementation of a project. These calculations are shown in Table 16. The most likely projected outcome is the 25-year protection plan, which results in a BCR of 4.73.

Table 16. Benefit-to-Cost Ratios for Incremental Deferments

Protection Plan	Annual Cost	Annual Benefits	BCR
Without Project	0	0	0
10-Year Infestation Delay	$7,250,000	$36,400,000	5.01
25-Year Infestation Delay	$7,250,000	$81,600,000	11.25
50-Year Infestation Delay	$7,250,000	$123,100,000	16.98

4.2 ECOSYSTEM CONSIDERATIONS

If dreissenids become established in the UMRB, many changes to the aquatic environment would occur. As the density of dreissenids increases, water clarity would increase due to plankton being consumed. This would decrease the food supply for young and small fish. As water clarity increases, light penetration would also increase, which would lead to aquatic plants being able to take root in deeper water. The area of rooted aquatic plants would increase, which would provide additional habitat for fish that might prey on young pallid sturgeon. The bottom substrate would become covered with live and dead mussels. Shorelines would be lined with sharp shells. Dreissenids would also attach to native mussels, competing with them for food and eventually killing them.

Hundreds of millions of dollars have been invested within the UMRB to protect, restore, and recover riparian and riverine aquatic habitat to support native plant and animal populations. An infestation of dreissenids would not only change the ecosystem, but could cause physical injury as fish migrate. Recreational fisheries could also be affected. Modified water quality could lead to habitat changes, which affect fish populations and composition. Native fish populations could also be negatively affected.

It may not be possible to avoid an infestation and associated impacts forever, but even delaying the establishment of dreissenids would allow for additional time for preparation. There could be additional education to reach a wider audience of the potential effects of transporting invasive species. Additional monitoring in the UMRB could occur that would allow for implementation of rapid response plans in an effort suppress their spread.

4.3 CONCLUSION

Based on the information evaluated in this LR/Programmatic EA, USACE has determined that there is federal interest in partnering with the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska to address the vulnerability of the UMRB to a dreissenid infestation. As described in Section 4.1, a conservative estimated annual cost avoided by delaying an infestation by 1 year exceeds the estimated annual costs associated with the watercraft inspection station program, thus demonstrating an economic benefit. Alternative 2 helps to address the vulnerability issues indicated in this section. The risk reduction efforts would also protect the environment by delaying potential impacts described in Section 4.2 (effects of the prevention efforts on the environment is provided in Section 6).

As previously described in Section 4.2 and later in Section 6, Alternative 2 would also generate significant ecosystem quality benefits that have not been quantified. Although they have not been quantified, these benefits are considered in the USACE decision making process.

Consistent with the USACE planning process, alternatives must be formulated in consideration of four criteria described in the Principle and Guidelines Report (U.S.

Water Resources Council 1983) for completeness, effectiveness, efficiency, and acceptability, which are described below.

- **Completeness.** Alternative 2, Comprehensive Adaptive Improvements, is the most complete solution available to reduce the risk of a dreissenid infestation. It includes every potential measure considered except Measure 8, which is outside existing authority. Together these measures address all planning objectives, without violating any planning constraints, creating powerful preventive actions, including monitoring, educational opportunities, planning for contingencies, and preparing for quick response to potential infestations. While this alternative cannot completely eliminate the possibility of a dreissenid infestation, it is the most comprehensive solution available.
- **Effectiveness.** Alternative 2, Comprehensive Adaptive Improvements, includes a combination of different actions to prevent the spread of dreissenids, while allowing watercraft to be transported between infested and uninfested areas of the country. In addition, the alternative promotes collaboration between the Western States to continue developing methods to reduce the risk of AIS infestations. This alternative is not 100 percent effective, but it is a broad solution that will do much to prevent a dreissenid infestation.
- **Efficiency.** Based on the current level of knowledge, if dreissenids continue to expand through the waters of the UMRB, it is likely they will become permanently established. For every year an infestation can be deferred through the actions that comprise Alternative 2, Comprehensive Adaptive Improvements, significant costs associated with an infestation can be avoided. The costs of improvements detailed in Alternative 2 would be a small fraction of the O&M costs resulting from an infestation.
- **Acceptability.** Alternative 2, Comprehensive Adaptive Improvements, is acceptable to all entities. The collaborative effort between the states will promote effective communication, intercept and prevent potential infestations, educate the public, and lead to continuous improvements in the early detection of dreissenids within the UMRB. The public will be able to transport watercraft from infested states to non-infested states with minimal disruption. While the solution is not all-encompassing, it is accepted as the most complete and effective solution available. The recommended alternative will not conflict with other regulation efforts.

4.3.1 Plan Selection

Using this guidance, each alternative was evaluated to determine if it met the four criteria described above. Using these criteria, it was determined that only Alternative 2 meets the study objectives and will contribute to an effective and efficient plan to defer dreissenid infestation and the associated negative impacts to the environment and infrastructure in the UMRB. There are no significant technical or engineering challenges associated with any of the measures. Compared to Alternative 1 (the No Action Alternative), Alternative 2 reduces the risk of deissenid infestations by delaying

the rate of development through the proposed measures such as federal participation in the selection of watercraft inspection station locations, increasing the number of watercraft inspection stations, extending daylight inspection hours, and more (see Table 9 for additional details). Risk is reduced through a delay based on the assumption that with success, an infestation could be staved off for at least 25 years from the project's inception and from there, develop gradually and thus incurring costs at Year 26 from project inception as opposed to Year 1 with FWOP. Based on the federal interest and environmental acceptability, Alternative 2, is the Recommended Alternative.

SECTION 5 - EXISTING CONDITIONS

This section provides general information about the environmental conditions within the approximately 352,173-square-mile study area. The background environmental information provided is limited due to a general lack of impacts associated with existing inspection stations and anticipated changes to station sites and operations.

5.1 FISHERIES/AQUATIC RESOURCES

The UMRB study area contains habitat for hundreds of species of native and non-native aquatic organisms. A diversity of trout species (Salmonidae) occupy the Rocky Mountain eastern slope rivers and streams in the upper reaches of the UMRB. Fisheries are characterized as cold to cool water species, and sport fishes such as rainbow and cutthroat trout are present in many waterways. Reservoirs support a wider range of fish species, ranging from cool water to warm water fish communities. Sport fish such as walleye (*Sander vitreus*), yellow perch (*Perca flavescens*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), and channel catfish (*Ictalurus punctatus*) are common in UMRB water bodies.

5.2 WATER QUALITY

Surface water in the UMRB is relatively clean compared to other regions in the nation. However, concern about the permanence of this status has been growing. Population growth, mining, logging, agriculture, and industry have created, and are continuing to create water quality issues and concerns. While some streambank erosion is natural, human alterations in the watershed have caused additional erosion, leading to increased turbidity at some times of the year.

Manmade reservoirs have changed water quality characteristics of the large rivers. Due to the large volume of stored water, temperatures do not fluctuate as much as in a natural river. The reservoirs warm slower in the summer and cool slower in the fall. Daily temperature fluctuations are also depressed. Slower water velocity and water quality changes also modified the types and density of various plankton, which affects water clarity and nutrient levels.

5.3 WILDLIFE/TERRESTRIAL RESOURCES

Terrestrial habitat within the basin includes many types, from mountainous forests to wide river valleys. The large quantity of water in the rivers of the basin make irrigated agriculture possible. There are now millions of acres of irrigated agriculture, which has dramatically altered native prairie habitats. Wildlife present throughout the basin includes both large and small mammals, birds, and reptiles. There are several protected species (see appendix). Other terrestrial resources, such as plants, including a variety of trees, shrubs, forbs, and grasses, can be found near the many and diverse habitat types throughout the states in the study area.

5.4 AESTHETICS/VISUAL RESOURCES

Aesthetics or visual resources are the natural and cultural features of the landscape that can be seen and contribute to the public's appreciative enjoyment of the environment. The aesthetic quality of an area is a subjective measure of one's perception of how pleasing an area is. The UMRB consists of a complex tapestry of mountains, high plateaus, semi-arid plains with plateau and canyons, the badlands, rolling grassland prairie with uplands and wetlands, and riparian river valleys woven together by the Upper Missouri River and its tributaries. Mountains are a major and dramatic presence in the western part of UMRB. There are a number of mountain ranges in the basin, including the Wind River range, the Bighorn range, and Yellowstone National Park. However, the aesthetic values of the Missouri River, the mountains, and surrounding landscapes vary based on the viewer's perspectives and values.

5.5 RECREATION

The UMRB provides a wide variety of opportunities for outdoor recreation, which in turn provides genuine value to residents, as well as economic opportunities through tourism. Due largely to its rural nature and scenic terrain, the UMRB provides many recreation areas that attract visitors to the region. A considerable industry has been established due to water- and land-based recreational opportunities. Depending on the particular location, popular activities include boating, swimming, water skiing, jet skiing, fishing, camping, hunting, walking, biking, and bird and wildlife viewing.

5.6 CULTURAL RESOURCES

The rivers and tributaries in the UMRB have provided the resources needed for human occupation of the basin for thousands of years. Prehistoric populations subsisted on riverine resources well before 9,000 B.C. (Chatters and Pokotylo 1998). These riverine cultures remained along the rivers and tributaries up until the middle and late 19th century when they were relocated to reservations (Walker 1998). During their extensive occupation along the rivers and tributaries of the UMRB, Native Americans subsisted on the abundant fish and aquatic resources available, and Traditional Cultural Properties and Historical Properties of Religious and Cultural Significance to Indian Tribes reflect important fishing locations and fishing villages native peoples occupied for collecting such resources.

5.7 CLIMATE CHANGE

Indications are that average global atmospheric temperatures are trending upward over the previous several decades and are correlated to increased atmospheric carbon dioxide levels (IPCC 2022). Internal combustion engines emit carbon dioxide (CO_2) as one byproduct of efficient burning of fuel (gasoline or diesel). International efforts are being directed at reducing carbon release into the atmosphere.

In the Rocky Mountains and plains of the UMRB, changes in snowpack, streamflows, and forest cover are already occurring. Future climate change would likely continue to influence these changes. Average annual temperature in the region is projected to

increase by 3-10°F by the end of the century, with the largest increases expected in the summer. Precipitation in the Western United States has seen a decline in both the amount of total snowfall and the proportion of precipitation falling as snow. Record snowpack in the upper Great Plains and Rockies during the winter of 2018-19, followed by heavy unseasonably warm rain in March 2019, contributed to severe flooding along the upper Missouri River and its tributaries during spring of 2019 in the UMRB. In contrast, in Washington State, where similar atmospheric factors operate and weather patterns occur, record low snowpack values were measured in April 2015 in 74 percent of long-term monitoring stations (USDA 2015). Changes in average annual precipitation in the West are likely to vary over the century. Winter precipitation in the form of rain not snow is projected to increase while summer precipitation is projected to decline by as much as 30 percent, with less frequent but heavier downpours (EPA 2016). Along with rising air temperatures, there would be a corresponding rise in stream temperature.

5.8 ENVIRONMENTAL JUSTICE

Executive Order 14008 *Tackling the Climate Crisis at Home and Abroad* states that environmental and economic justice are key concerns for the federal government and its implementing agencies. It further directs agencies to develop programs to address disproportionately high and adverse impacts to disadvantaged communities. A key tool for achieving these goals is the Justice40 Initiative which established a goal that 40 percent of the overall benefits of federal investments flow to disadvantaged communities.

The Council on Environmental Quality (CEQ) has developed a Climate Change and Economic Justice Screening Tool (CEJST) (Version 1.0) to identify these disadvantaged communities. The tool identifies census tracts that are burdened in one or more categories, including climate change, energy, health, housing, pollution, transportation, water, and workforce. A community is highlighted as disadvantaged on the CEJST map if it is in a census tract that is (1) at or above the threshold for one or more environmental, climate, or other burdens, and (2) at or above the threshold for an associated socioeconomic burden. Federally Recognized Tribes, including Alaska Native Villages, are also considered disadvantaged communities.

The tool is also available as a geographic information system (GIS) dataset. This dataset was downloaded on 12 April 2023, and census tracts within the UMRB were selected for analysis. According to the CEJST, 227 of the 965 census tracts in the UMRB are disadvantaged in at least one category, and many are disadvantaged across multiple burden categories (Table 17). The most common category of burden was Climate which identifies communities that are high risk of projected flood and wildfire risk or at high risk of agricultural, building, or population loss due to climate change. One hundred twenty-six tracts identified as disadvantaged in terms of Climate – these tracts are above the 90th percentile of one of the climate burdens and above the 65th percentile for low income. The second most commonly burdened category was Energy, which identifies low-income tracts that are also above the 90th percentile in energy costs

or fine particulate air pollution (PM2.5). Ninety-eight tracts in the UMRB were identified as disadvantaged in the Energy category. Ninety-three tracts were identified as disadvantaged in the Health category which indicates low-income tracts with very high rates of asthma, diabetes, or heart disease, or low life expectancy. Numerous tracts were disadvantaged across multiple categories; on average each disadvantaged tract was disadvantaged in three different categories.

Table 17. Summary of Environmental Justice Statistics

State	Tracts	DA Tracts	Climate	Energy	Traffic	Housing	Pollution	Water	Health	Work-force
Montana	198	62	27	27	5	19	37	23	33	14
Nebraska	405	86	29	46	21	47	51	33	27	40
North Dakota	94	6	5	3	0	1	2	1	2	3
South Dakota	219	68	61	19	0	18	17	7	30	19
Wyoming	49	5	4	3	0	1	4	1	1	2
Grand Total	965	227	126	98	26	86	111	65	93	78

Geographically, there was no distinct skew to the disadvantaged tracts. Disadvantaged tracts in each state are roughly proportional to the number of census tracts in the UMRB in each state. Similarly, there is also no distinct skew between cities and rural areas, with numerous disadvantaged tracts to be found in both.

SECTION 6 - ENVIRONMENTAL CONSEQUENCES

While Section 4 describes the economic and ecosystem effects of a potential dreissenid infestation in the UMRB, this section addresses the environmental and social consequences of the proposed federal action. Specifically, this section discusses effects anticipated to occur over a wide range of environmental resources and social considerations as a result of the proposed action. The anticipated effects associated with the No Action Alternative are compared to those of the Proposed Action Alternative. The USACE analysis did not identify any adverse environmental effects.

Federal participation in the program would be dependent on the states continuing to fund the program and Congress specifically appropriating funds for the program. In 2019, expenditures by the states totaled about $5.9 million in prevention efforts.

Although individual state budgets fluctuate annually, the initial estimated annual cost to the federal government to fully participate in the program would be the same. The commitment of resources may increase if risks increase, or it may decrease, or the program may be eliminated if an infestation becomes permanently established within the UMRB.

As of a result of coordination with the states, USACE did not identify any conflicts to land-use plans. The process of selecting locations for watercraft inspection stations (see section 2.2.2) accounted for existing land uses.

USACE considered, but did not identify, any potential effects to threatened and endangered species, noise pollution, vegetation, air quality, or hazardous/toxic materials. Therefore, those resource areas are not detailed below. However, a biological evaluation is included as an appendix, which describes the threatened and endangered species analysis and determinations.

The proposed action is intended to reduce the risk of invasive species infestations and, as a result, avoid or delay the adverse economic, environmental, and social consequences of such infestations.

6.1 ALTERNATIVES

6.1.1 Description of the No Action Alternative

The existing conditions are described in Section 5. The No Action Alternative represents a continuation of the states' current practice, in which USACE would not support establishing any watercraft inspection stations to protect the UMRB and USACE water-related infrastructure therein. Section 2.2 provides information pertaining to existing watercraft inspection stations and their operation.

6.1.2 Description of the Proposed Action Alternative, Comprehensive Adaptive Improvements

Implementation of the proposed alternative would mean that USACE, in collaboration with the AIS coordinators of the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska, would establish watercraft inspection stations at locations that have the highest likelihood of preventing the spread of AIS at reservoirs operated and maintained by USACE within the perimeter boundary of the UMRB. Monitoring reservoirs within and outside the UMRB for early detection of dreissenid veligers would occur independent of watercraft inspection stations.

The USACE would partner with the state's AIS coordinators to establish watercraft inspection stations very similar to the existing watercraft inspection station program in terms of configuration and operations (see Sections 2.2 and 3.4, Measure 1). States would also coordinate and direct the operation of inspection stations within their boundaries that fall outside the watershed boundary of UMRB with the intent to best protect UMRB waters from cross-basin transfer of dreissenids on, for example, trailered watercraft. If watercraft inspection and decontamination stations are proposed for cost share outside of the five UMRB states, a tiered EA would be required to analyze that action outside of the study area. Similarly, rapid response plans should include tiered environmental compliance as a component of plan development. Implementation of rapid response plans may require emergency environmental and ESA compliance documentation.

6.2 FISHERIES/AQUATIC RESOURCES

A dreissenid infestation would adversely impact fisheries and aquatic resources within the UMRB, to include impacting species and habitats protected under the ESA. The amount of food and shelter for fish and aquatic resources would be altered, changing the types and abundance of species able to survive.

Spawning and rearing habitat, including critical habitat, for some species would also be negatively impacted. Physical injury to fish could occur from abrasion, especially at fish passage facilities.

6.2.1 No Action Alternative

Under the No Action Alternative, the risk of infestation affecting fisheries and other aquatic resources would remain similar to existing conditions, and thus would not result in any benefits. Taking no action would not result in impacts to aquatic resources, as the risk of an AIS infestation would also remain at levels similar to the existing conditions.

6.2.2 Proposed Action Alternative

Similar to the existing program, watercraft inspection stations would be established in paved or gravel areas. Any runoff from cleaning a vessel would be contained. It would either be collected, percolate directly into the ground, evaporate, or go into a retention

basin where it would percolate into the ground. No new ground disturbance would occur to establish watercraft inspection stations without further environmental review. Monitoring reservoirs for the early detection of dreissenid veligers would have no effect on fisheries or aquatic resources.

There would be no threat of runoff into any water body, as inspection stations would not be located close enough to any water body. On occasion, watercraft owners may request a decontamination at their home if they have been at infested water bodies.

In such instances, trained staff would evaluate the location, including where any runoff could go. If there is any chance of discharging to an uninfested water body, the watercraft would be hauled to an area where no water or debris from the wash/decontamination would be discharged into a water body.

The proposed action would not negatively affect fisheries or other aquatic resources in the UMRB either directly or indirectly over the short-term or long-term. There would be no additional cumulative effects on this resource. The proposed action would be expected to positively affect fisheries and other aquatic resources due to the reduced risk of infestation provided by the additional funding allocated to support the program.

6.3 WATER QUALITY

An infestation would adversely impact water quality within the UMRB. The adult mussels would filter huge quantities of water as they feed. Water clarity would increase, which would have negative effects on the ecosystem. In addition to the negative effects to aquatic resources, rooted aquatic plants would persist into deeper water than normal.

6.3.1 No Action Alternative

Under the No Action Alternative, water quality would remain at levels similar to the existing conditions because the risk of an AIS infestation would also remain at levels similar to the existing conditions. Taking no action would therefore not result in direct or indirect, short-term, long-term, or cumulative effects to water quality.

6.3.2 Proposed Action Alternative

The effects on water bodies of establishing and operating watercraft inspection stations, and thus water quality, would be the same as discussed in the fisheries/aquatic resources section. The proposed action would not negatively affect water quality in the UMRB directly or indirectly in either the short term or long term. There would be no additional cumulative effect on this resource. There would be no additional cumulative effect on this resource. The indirect effects would be positive due to the reduced risk of infestation provided by the additional funding allocated to support the program.

6.4 WILDLIFE/TERRESTRIAL RESOURCES

An infestation would adversely impact wildlife and terrestrial resources within the UMRB, potentially to a significant degree. Those adverse impacts would be expected to be conveyed through the ecosystem.

6.4.1 No Action Alternative

Under the No Action Alternative, the conditions related to wildlife and terrestrial resources would remain similar to the existing conditions. The risk of an AIS infestation would also remain at levels similar to the existing conditions. Taking no action would therefore not result in direct or indirect, short-term, long-term, or cumulative effects to wildlife or terrestrial resources.

6.4.2 Proposed Action Alternative

Under the proposed action, some wildlife could be present near a new inspection station from time to time. However, most inspection sites are established in areas that have constant human presence and wildlife would not be present. Some additional forbs or grasses could be trampled if shelters, equipment, or work vehicles are parked in vegetated areas alongside the watercraft inspection site.

The following stipulations would be followed to eliminate any impacts to ESA-listed and other protected species:

1. No new ground disturbance would occur to establish watercraft inspection stations without performing a survey of the area for ESA-listed species or protected migratory bird nests if they might be present in the area (see Table 17 in Section 7).
2. Water or debris from a hot wash or other decontamination would be prevented from entering any water body.
3. Wash water would not be allowed to flow over land covered by any type of vegetation without performing a survey of the area for ESA-listed plants in specific areas (see Table 17 in Section 7.1.2).
4. Any runoff from washing/decontaminating a vessel would either evaporate, percolate directly into the ground, be collected in a retention basin with no possibility of reaching water bodies or wetlands or be captured and transferred to a location away from any water body.
5. There could be instances where a wash/decontamination would be performed at a watercraft owner's residence. In such instances, trained staff would evaluate the location, including where any runoff could go. If there is any chance of discharging to an uninfested water body, the watercraft would be hauled to an area where no water or debris from the wash/decontamination would be discharged into a water body.
6. There would be no wetland disturbances or other negative effects to wetlands.

7. Watercraft inspection station sites would be assessed/surveyed to determine presence/absence of suitable habitat/location of ground-nesting or shrub-nesting birds.
8. Monitoring reservoirs for the early detection of dreissenid veligers would have no effect on wildlife/terrestrial resources.

By following the above stipulations to avoid impacts to wildlife and terrestrial resources there would be no direct or indirect, short-term or long-term, or cumulative effects impacts caused by the proposed action. In the absence of adverse impacts on terrestrial resources overall, the proposed action would be expected to be positive due to the reduced risk of infestation provided by the additional funding allocated to support the program.

6.5 AESTHETICS/VISUAL RESOURCES

If a dreissenid infestation were to occur there would be negative impacts on this resource. Small mussels would attach to virtually all hard surfaces, including rocks and manmade structures such as water intake pipes, rocks, boats, and others. The shoreline would be lined with dead mussel shells.

6.5.1 No Action Alternative

Under the No Action Alternative conditions related to aesthetics and visual resources would remain at levels similar to the existing conditions. No significant changes would be anticipated. Taking no action would therefore not result in in direct or indirect, short-term, long-term, or cumulative effects to aesthetic or visual resources.

6.5.2 Proposed Action Alternative

The proposed action would cause minimal changes to the aesthetic or visual resources of areas where watercraft inspection stations would be located, as the stations would be placed in already developed areas. Most travelers on major interstates may not notice a station. Inspection stations would include signage along the travel route requiring watercraft haulers to stop for an inspection. This is the only visual difference most travelers would notice. At the inspection location, there would most likely be a storage container or canopy, a portable restroom, and various equipment such as a pickup truck and wash-water tank, which would not be significantly aesthetically displeasing (Figure 18). Monitoring reservoirs for the early detection of dreissenid veligers would have no effect on aesthetic/visual resources.

The proposed action would not significantly affect aesthetic or visual resources in the UMRB directly or indirectly in either the short term or long term. There would be no additional significant cumulative effect on this resource.

Figure 18. Examples of State-Operated Watercraft Inspection Station in UMRB

6.6 RECREATION

If dreissenids were to become established, recreationists would be negatively impacted. Anyone walking along the shoreline or in the water would need to wear shoes, or risk being cut by sharp shells. The types and abundance of fish sought by anglers would likely change. Additional impacts to the quality of recreation from an infestation would be due to subsequent cleanup and maintenance at the infested waterbody. Cleanup and maintenance could include a range of actions, from closure of the waterbody from boat traffic and swimming to drawing down water levels to allow winter freeze kill of dreissenids. These impacts would likely endure for multiple years following dreissenid infestation and establishment.

6.6.1 No Action Alternative

Under this alternative, the AIS coordinators in the five study area states would continue their programs to prevent the spread of dreissenids, and the risk would remain unchanged. Taking no action would therefore not result in direct or indirect, short-term, long-term, or cumulative effects to recreation resources.

6.6.2 Proposed Action Alternative

USACE involvement in establishing watercraft inspection stations would have negligible effects on recreation and the recreating public in the proposed action area. Because the state AIS coordinators have been conducting watercraft inspections for the past ten years, most people hauling boats and other watercraft are accustomed to the routine of stopping for inspections.

Some people transporting watercraft may initially have a negative reaction to the inspection stations due to the feeling they are being inconvenienced or being required to stop for additional or multiple stations. However, many of these people may change their position once they learn the importance of stopping the spread of AIS (especially dreissenids) and that taking the necessary cleaning actions and precautions will shorten the length of their delay.

The proposed action would therefore not negatively affect recreational activities in the UMRB directly or indirectly in either the short term or long term. There would be no additional cumulative effect on this resource. The indirect effects would be positive due to the reduced risk of infestation provided by the additional funding allocated to support the program.

6.7 CULTURAL AND HISTORIC RESOURCES

6.7.1 No Action Alternative

The five study area states are likely to continue their watercraft inspection programs without federal funding or support. Therefore, negligible impacts to cultural and historic resources would be expected, as operations would continue as they currently exist.

6.7.2 Proposed Action Alternative

The proposed action would require USACE to collaborate with AIS coordinators of the study area states to establish watercraft inspection stations at and within the perimeter of the UMRB. These inspection stations would be located where infrastructure would support the facilities, and where a suitable space for decontamination exists that prevents contaminated runoff from reaching UMRB waters. This would, therefore, limit inspection stations to parking lots, gravel pits, and other previously disturbed localities. All proposed improvements, particularly if they include any new ground-disturbing activity, would require USACE to complete a separate NEPA analysis to include National Historic Preservation Act (NHPA) Section 106 review and the Programmatic Agreement for the Operation and Management of the Missouri River Main Stem system for Compliance with the National Historic Preservation Act, as amended.

After the site-specific analysis is complete, USACE would initiate the corresponding consultation with appropriate entities (State Historic Preservation Officers (SHPOs)), Tribal Historic Preservation Officers (THPOs), concerned Tribes, and other interested parties. If the appropriate SHPOs or THPOs concur with the findings for the proposed undertakings, the improvements would be authorized.

There would be no additional cumulative effects to cultural or historic resources.

6.8 CLIMATE CHANGE

Thermal ranges for dreissenid persistence are from approximately 3°C to as high as 30°C. Optimal thermal conditions for dreissenid reproduction and larval development are from 14°C to 22°C and would generally occur in the spring and summer (USGS 2016).

The Upper Missouri River and major tributaries are typically within this range from May to as late as November. Summer temperatures typically do not exceed this range. The UMRB is currently highly susceptible to dreissenid infestation as water temperatures are suitable for reproduction with a long potential reproductive season.

Potential consequences of climate change include reduced snowpack, higher winter streamflows and increased flooding risk, earlier snowmelt-generated peak flows, and lower summer flows (Reed et al. 2020). These conditions are likely to result in higher stream temperatures and an extended range of time within the suitable dreissenid thermal reproductive range, which could result in higher susceptibility to infestation and greater impacts of infestation.

6.8.1 No Action Alternative

There would not be any effects to climate change as a result of implementing the No Action Alternative. Gradual climate change would continue, in correlation with increasing CO_2 emissions worldwide. In addition, climate change would not affect implementation of the No Action Alternative.

6.8.2 Proposed Action Alternative

There would be extremely negligible effects on climate change as a result of implementing the proposed action. Vehicles idling at watercraft inspection stations is a part of world-wide cumulative contributions to change in climate by way of increases in greenhouse gas emission. Given the minuscule contribution of CO_2 emissions resulting from the proposed action to overall global emissions, effects are insignificant. Therefore, there would be no significant direct, indirect, short-term, long- term, or cumulative effects to climate change.

As with the No Action Alternative, climate change would not affect implementation of the proposed action.

6.9 ENVIRONMENTAL JUSTICE

6.9.1 No Action Alternative

A dreissenid or other AIS infestation could adversely impact environmental justice within the UMRB. A new infestation could reduce tourism to the UMRB or to specific lakes

within the UMRB, which could lead to income or job loss. Infestations of infrastructure could also create job loss or increase energy costs . While not specifically addressed as part of the water category, a new infestation of dreissenids would adversely affect water quality, potentially intensifying existing burdens in the UMRB.

6.9.2 Proposed Action Alternative

There would be minor beneficial effects to environmental justice from implementing the Proposed Action Alternative. Delaying new infestations in the UMRB would preserve present economic opportunities and be protective of infrastructure in the UMRB. These are direct beneficial effects, but difficult to quantify. Monitoring, contingency planning, and rapid response planning and preparation would have similar minor beneficial effects to environmental justice. The proposed action would not have adverse impacts to Justice40 communities. Given that the benefits to fish, wildlife, and water quality would be distributed broadly across the UMRB, the proposed action would likely support the Justice40 Initiative, as more than 40% of census tracts in the proposed action area are disadvantaged.

The watercraft inspection stations may have negligible effects to environmental justice. Inspection stations are along roadways and highway and may contribute slightly to traffic burdens. However, inspection stations would not meaningfully contribute to traffic burdens as they are few in number when compared to traffic as a whole and would not be noticed by most motorists. Inspection stations would increase travel time for those towing boats, but this is also a very small fraction of total roadway traffic and would have extremely minor impacts to overall traffic burdens. Therefore, there would be no significant adverse direct, indirect, short-term, long- term, or cumulative effects to environmental justice.

6.10 CUMULATIVE EFFECTS

NEPA and the CEQ regulations for implementing NEPA require federal agencies to consider the cumulative effects of their actions. Cumulative effects are defined as effects “on the environment which result from incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time” (40 CFR § 1508.7).

The primary goal of a cumulative effects analysis is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and reasonably foreseeable future actions.

Past and Present: Prior to 2007, there were no regional organizations whose primary missions were focused on aquatic invasive species prevention in the UMRB. The 100th Meridian Initiative was one of the first organizations with a goal of preventing the spread of AIS (specifically zebra and quagga mussels) in the west, and was for many years, the cornerstone of consistent efforts between the U.S. and Canada. Currently, the activities and efforts of the 100th Meridian Initiative are being funded by the USFWS and undertaken by non-governmental agencies, Tribal, state, interstate, and federal agencies.

Reasonably Foreseeable Future: Federal investment in this project would further expand and support existing state and Canadian programs, resulting in increased effectiveness in the watercraft inspection program to decrease the vulnerability to a dreissenid infestation to the UMRB. It is likely that the program would expand into the future to address a wide suite of aquatic pests.

The analysis of the environmental resources above concludes that implementation of the proposed action would not result in significant adverse effects, either individually or cumulatively with other effects.

SECTION 7 - COMPLIANCE WITH APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS

This section identifies the legal, policy, and regulatory requirements applicable to the proposed action and discusses the implications for each of those requirements. Summaries of compliance and coordination activities for each of the laws, policies, or regulation are also provided. Also included in this section are additional authorities and guidance related to the proposed action.

7.1 FEDERAL LAWS

7.1.1 National Environmental Policy Act

As required by NEPA and subsequent implementing regulations promulgated by the CEQ, this LR/Programmatic EA was prepared to determine whether the proposed action constitutes a "…major federal action significantly affecting the quality of the human environment…" and whether an EIS is required. This LR/Programmatic EA documents the evaluation and consideration of potential environmental effects associated with the proposed action.

USACE identified no impacts significantly affecting the quality of the human environment as a result of the analyses conducted in Section 6 of this LR/Programmatic EA. The Draft FONSI and this LR/Programmatic EA were distributed to relevant federal, state, and local agencies, the Services, the Tribes, and the public for a 30-day review and comment period from February 9, 2021, through March 2, 2021. Two comments were received, both expressing support of the Preferred Alternative. Due to editorial changes made to this LR/Programmatic EA, coupled with the extended time finalizing the document, USACE deemed it necessary to conduct a second public review, that began on April 3, 2023, and concluded on April 17, 2023. One comment letter in support of the program was received, therefore, compliance with NEPA will be achieved upon signing the final FONSI, which is the decision document associated with this LR/Programmatic EA.

7.1.2 Endangered Species Act

The ESA established a national program for the conservation of threatened and endangered fish, wildlife, and plants and the habitat upon which they depend. Section 7(a)(2) of the ESA requires federal agencies to consult with the USFWS and National Marine Fisheries Service if an action may affect a listed species to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Section 7(c) of the ESA and the federal regulations on endangered species coordination (50 CFR § 402.12) require that federal agencies prepare biological assessments of the potential effects of major actions on listed species and critical habitat.

There are 25 ESA-listed species that could potentially be present in the UMBR study area (see appendix for detailed assessment of each species): 5 mammals, 5 birds, 2

clams, 2 fish, 5 insects, and 6 plants. If any ESA-listed small mammal or plant species could be in a county or watershed where watercraft inspection stations are established and any ground-disturbing or vegetation-disturbing activity is planned, surveys for their presence would be conducted and impacts to the protected species would be avoided. Table 18 lists the ESA-listed species and the locations where watercraft inspection activities (e.g., roadside and rampside) would have a possibility of encountering them, so that surveys would be conducted to ensure there would be no effect to them.

Table 18. ESA-Listed Species Requiring Site-Specific Survey for Any Projects with Ground-Disturbing or Vegetation-Disturbing Activities

Additional Survey/Habitat Assessment Potentially Required for Ground Disturbance	
Location	**Species**
Montana, Wyoming, North Dakota, South Dakota, Nebraska	Northern Long-eared Bat
South Dakota	Leedy's Roseroot
Wyoming	Yellow-billed Cuckoo
Southeastern Nebraska	Salt Creek Tiger Beetle
Wyoming	Desert Yellowhead
Montana, Wyoming, Nebraska	Ute Ladies'-tresses

USACE determined that the establishment of watercraft inspection stations would have no effect on ESA-listed species or designated or proposed critical habitat. Monitoring at water bodies for the early detection of dreissenids would have no effect on terrestrial or aquatic ESA-listed species. Rapid response plans should develop separate programmatic biological assessments for initiating ESA consultation. However, there are some stipulations required to justify this determination (see Section 6.4.2 and appendix for detailed discussion).

7.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC. §§ 703-712 *et seq*., as amended) prohibits the taking of and commerce in migratory birds (live or dead), any parts of migratory birds, their feathers, or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof.

Watercraft inspection station sites would be assessed/surveyed to determine presence/absence of suitable habitat/location of ground-nesting or shrub-nesting birds. No trees, shrubs, or other bird habitat is proposed to be cut or damaged by the establishment of watercraft inspection stations. Birds would not be affected. There would be no take of migratory birds.

7.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC §§ 668-668c *et seq*.) prohibits anyone, without a permit issued by the Secretary of the Interior from taking

bald or golden eagles, including their parts, nests, or eggs. Take is defined in the BGEPA as any attempt to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. Disturb is defined the BGEPA as, to agitate or otherwise bother a bald or golden eagle such that it is likely to cause (1) injury, (2) interference with breeding, or (3) nest abandonment.

Watercraft inspection station sites would be assessed/surveyed to determine presence/absence of suitable habitat/location of bald or golden eagles. No trees, shrubs, or other bald or golden eagle habitat is proposed to be cut or damaged by the establishment of watercraft inspection stations. Bald or golden eagles would not be affected. There would be no take of bald or golden eagles.

7.1.5 National Historic Preservation Act

The NHPA of 1966, as amended (54 USC §§ 300101 *et seq*.), directs federal agencies to assume responsibility for all historic properties under their jurisdiction. Section 106 of the NHPA (54 USC § 306108) requires agencies to consider the potential effect of their actions on properties that are listed, or are eligible for listing, on the National Register of Historic Places. The NHPA implementing regulations, 36 CFR Part 800, require that the federal agency consult with the SHPO, Tribes, and interested parties to ensure that all historic properties are adequately identified, evaluated, and considered in planning for proposed undertakings.

All proposed improvements, particularly additional amenities requiring ground-disturbing activity will comply with Section 106 review and the Programmatic Agreement for the Operation and Management of the Missouri River Main Stem system for compliance with the National Historic Preservation Act, as amended.

7.1.6 Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (25 USC §§ 3001 *et seq*.) addresses the discovery, identification, treatment, and repatriation of Native American and Native Hawaiian human remains and cultural items (i.e., associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony).

Although not expected, in the event of an inadvertent discovery during construction, work would immediately halt, and reasonable resource protective measures would be implemented. After the area is secured, the appropriate authorities should be contacted, including local law enforcement, the federal land manager, appropriate SHPO, and regional Tribal groups.

7.1.7 Clean Water Act

The Federal Water Pollution Control Act (33 USC §§ 1251 *et seq*., as amended) is more commonly referred to as the Clean Water Act. This Act is the primary legislative vehicle for federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the United States. The Act was established to

restore and maintain the chemical, physical, and biological integrity of the Nation's waters and sets goals to eliminate discharges of pollutants into navigable water, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment. The Act has been amended numerous times and given a number of titles and codifications.

Section 402 of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) Program, which regulates the discharge of pollutants. No pollutants would be discharged into waters of the United States by activities proposed in this LR/Programmatic EA. Section 402 also regulates storm water runoff. A NPDES permit would not be needed, because there is no discharge of pollutants, and a Construction General Permit would not be required because ground disturbance would be less than an acre.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into wetlands or other Waters of the U.S. Because no fill material would be placed in wetlands, or other Waters of the U.S., a Clean Water Act Section 404(b)(1) Evaluation is not required, and therefore, no Least Environmentally Damaging Practicable Alternative (LEDPA) need be identified.

7.2 EXECUTIVE ORDERS

7.2.1 Executive Order 11988, Flood plain Management, May 24, 1977

EO 11988 requires federal agencies to recognize the significant values of flood plains and to consider the public benefits that would be realized from restoring and preserving flood plains. The Executive Order has an objective – the avoidance, to the extent possible, of long-and short-term adverse impacts associated with the occupancy and modification of the base flood plain and the avoidance of direct and indirect support of development in the base flood plain wherever this a practicable alternative. Each federal agency must evaluate the potential effects of actions on flood plains and avoid undertaking actions that directly or indirectly induce development in the flood plain or adversely affect natural flood plain values.

Due to the very nature of the proposed cost-share program (assisting states in bolstering existing and/or building new) watercraft inspection stations, it is probable that some watercraft inspection stations are currently, or would be located in the designated flood plain throughout the UMRB in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska. However, because a typical station only consists of a shelter/covering, such as a shipping container, a construction trailer, canopy, or tent; a transport vehicle; a hot water pressure washer; outreach and educational materials; directional devices such as cones and signage; and applicable personnel amenities (heaters for cold weather, portable restrooms, etc.), or is a roving station, there would be no long-or short-term adverse impacts, no alteration of the flood plain, and development in the flood plain would not be induced or promoted.

7.2.2 Executive Order 11990, Protection of Wetlands, May 24, 1977

EO 11990 directs federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands. Section 2 of this order states that, in furtherance of the NEPA, agencies shall avoid undertaking or assisting in new construction located in wetlands unless there is no practicable alternative.

No wetlands would be impacted by the proposed action.

7.2.3 Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021

EO 14008 directs states that environmental and economic justice are key concerns for the federal government and its implementing agencies. It further directs federal agencies to develop programs to address disproportionately high and adverse impacts to disadvantaged communities.

Implementation of the Recommended Alternative would not have adverse effects to human health or the environment, nor to any particular socioeconomic group. The effects of the proposed program are expected to be broadly positive due to the reduced risk of infestation provided by the additional funding allocated to support the program. The proposed program would not adversely or disproportionately affect minority or low-income populations.

7.3 ADDITIONAL AUTHORITY AND GUIDANCE

Additional authority and guidance related to the proposed action includes the following:

Executive Order 13751, Safeguarding the Nation from the Impacts of Invasive Species. Under EO 13751, federal agencies are required to prevent the introduction, establishment, and spread of invasive species, as well as to eradicate and control populations of invasive species that are established. (See also EO 13112, Invasive Species).

USACE Invasive Species Policy. USACE Invasive Species Policy of June 2, 2009, compliments the National Invasive Species Act (and related laws) and directs Civil Works to address invasive species concerns in analyses of project impacts, and authorizes permits to include stipulations regarding control of invasive species.

USACE Environmental Operating Principles. The USACE Environmental Operating Principles (EOPs) (https://www.usace.army.mil/Missions/Environmental/Environmental-Operating-Principles) have been taken into consideration throughout the study process, and would continue to be part of the implementation of the proposed action. Below are the USACE EOPs:

- Foster sustainability as a way of life throughout the organization.

- Proactively consider environmental consequences of all USACE activities and act accordingly.
- Create mutually supporting economic and environmentally sustainable solutions.
- Continue to meet corporate responsibility and accountability under the law for activities undertaken by USACE, which may impact human and natural environments.
- Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.
- Leverage scientific, economic, and social knowledge to understand the environmental context and effects of USACE actions in a collaborative manner.
- Employ an open, transparent process that respects views of individuals and groups interested in USACE activities.

In coordination with the agencies and other stakeholders, USACE proactively considered the environmental consequences of several measures and developed a comprehensive solution that supports economic and environmentally sustainable solutions.

SECTION 8 - COORDINATION, TRIBAL CONSULTATION, AND PUBLIC INVOLVEMENT

In preparation for developing this LR/Programmatic EA, AIS coordinators from the five UMRB study area states provided information on their respective watercraft inspection station programs and reviewed and consulted on the development of data summaries and other sections of the document during development. Because of COVID-19 and social distancing guidelines, no in-person meetings were held. However, the teams collaborated via conference calls and e-mail to discuss the project, identify challenges, and strategize solutions, and exchange data and ideas.

Tribal Coordination and Consultation

The U.S. Government has a unique legal relationship with Tribal Nations, governed by treaties, statutes, Executive Orders, court decisions, and the U.S. Constitution. The United States works with Indian Tribes on a government-to-government basis to address issues concerning Indian Tribal self-government, trust resources, and Indian Tribal treaty and other rights. As such, USACE will make good faith efforts to engage Tribes to ascertain interest in USACE projects and obtain information relevant to USACE federal decisions.

The USACE Tribal Consultation Policy is composed of the following six principles: Tribal Sovereignty, Tribal Responsibility, Government to Government Relations, Pre-Decisional and Honest Consultation, Self-Reliance, Capacity Building and Growth, Natural and Cultural Resources. Specific to this action, USACE Omaha District (Omaha District) strives to establish relationships that focus on successful communications and a collaborative process that ensures Tribal involvement in project development and implementation.

On February 19, 2021, USACE sent 68 information letters to points of contact for 34 Native American Tribes in the UMRB, and two information letters to the Advisory Council for Historic Preservation, to notify them of the proposed action and opportunity to review the NEPA documents. In this letter, USACE also extended the invitation of government-to-government consultation. Letters were sent to the following Tribes and organizations:

Advisory Council for Historic Preservation
Assiniboine and Sioux Tribes of Fort Peck
Blackfeet Tribe
Bureau of Indian Affairs
Cheyenne River Sioux Tribe
Chippewa Cree Tribe of the Rocky Boy's Reservation
Crow Creek Sioux Tribe
Tribal Historic Preservation Officer
Crow Nation
Eastern Shoshone Tribe
Flandreau Santee Sioux Tribe
Fort Belknap Indian Community
Gros Ventre and Assiniboine Tribes
Lower Brule Sioux Tribe
Mandan, Hidatsa & Arikara Nation
Montana State Historic Preservation Office
National Trust for Historic Preservation
History Nebraska

North Dakota Historical Society
Northern Arapaho Tribe
Northern Cheyenne Tribe
Oglala Sioux Tribe
Omaha Tribe of Nebraska
Ponca Tribe of Nebraska
Rosebud Sioux Tribe
Sac and Fox Nation of Missouri in Kansas and Nebraska
Santee Sioux Nation
Sisseton-Wahpeton Sioux Tribe
South Dakota Department of Game, Fish and Parks
South Dakota State Historical Society
Spirit Lake Sioux Tribe
Standing Rock Sioux Tribe
Turtle Mountain Band of Chippewa
Winnebago Tribe of Nebraska
Yankton Sioux Tribe

Public and Agency Review

USACE did not find any impacts significantly affecting the quality of the human environment as a result of the analyses conducted in Section 6 of this LR/Programmatic EA. The Draft FONSI and this LR/Programmatic EA were made available to interested members of the public, Tribes, and federal, state, and local agencies beginning February 9, 2021, with comments requested to be received or postmarked no later than March 2, 2021. The LR/Programmatic EA was also sent for review and comment to all five state AIS coordinators. Two comments were received, both expressing support of the Preferred Alternative. USACE considered all comments received, prepared responses, and made clarifications to the report to address the comments. The comments received were not substantive and did not affect the decision-making process.

Due to editorial changes made to this LR/Programmatic EA, coupled with the extended time finalizing the document, USACE deemed it necessary to conduct a second public review, that began on April 3, 2023, and concluded on April 17, 2023. One comment letter in support of the program was received. Compliance with NEPA will be achieved upon signing the final FONSI, which is the decision document associated with this LR/Programmatic EA. The final documents are available to the public on the USACE website at https://www.nwo.usace.army.mil/Missions/Civil-Works/Planning/Project-Reports/

To notify the public of the draft report available for review, a press release for each review period was issued to all major communities in the UMRB, including the following:

- Montana – Billings, Bozeman, Helena, Great Falls, Glasgow.
- Wyoming – Casper, Cheyenne, Lander, Sheridan.
- North Dakota – Bismark, Fargo, Dickinson, Minot, Williston.
- South Dakota – Sioux City, Pickstown, Pierre, Rapid City, Aberdeen.
- Nebraska – Omaha, Lincoln, Grand Island, North Platte, Norfolk, Scottsbluff.

SECTION 9 - RECOMMENDATIONS

Based on the information evaluated in this LR/Programmatic EA, USACE selects Alternative 2, Comprehensive Adaptive Improvements, as the Recommended Alternative. The features of the Recommended Alternative include augmenting the future AIS programs with the potential cost-shared measures below:

- Measure 1 - Federal Participation in Selection of Watercraft Inspection Station Locations
- Measure 2 – Increase Watercraft Inspection Stations
- Measure 3 – Extend Daylight Inspection Hours
- Measure 4 – Increase Nighttime Inspections
- Measure 5 – Construct Site Improvements
- Measure 6 – Add Canine Detection
- Measure 7 – Increase Public Awareness and Education
- Measure 9 – Monitor to Identify Water Chemistry
- Measure 10– Monitor for Early Detection
- Measure 11 – Regional WID Data Sharing System
- Measure 12 – Develop and Implement Real-time Tracking of Watercraft Transportation
- Measure 13 – Evaluate Traffic Patterns for Recreational Boating
- Measure 14 – Contingency Planning
- Measure 15 – Rapid Response Planning

The following recommendations include actions within the authority of Section 104 of the RHA of 1958 (33 USC § 610), as amended by Section 1039(d) of the Water Resources Reform and Development Act of 2014 (PL 113-121), Section 1178(b) of the Water Infrastructure Improvements for the Nation Act of 2016 (PL 114-322), Section 1170 of WRDA of 2018 (PL 115-270), and Section 505 of WRDA of 2020 (PL 116-260), as well as actions that will require additional authority to implement.

9.1 WATERCRAFT INSPECTION STATIONS IN MONTANA, WYOMING, NORTH DAKOTA, SOUTH DAKOTA, AND NEBRASKA

Montana, Wyoming, North Dakota, South Dakota, and Nebraska annually establish seasonal watercraft inspection stations in strategic locations both in and outside the UMRB based on several factors: safety of personnel and public; ease of public access; infrastructure availability for setting up facilities (electricity, water, restrooms, etc.); and where applicable, availability of a suitable space for conducting decontamination procedures that does not pose any threat to the environment. Although only water is used to decontaminate watercraft, watercraft inspection stations are set up in parking lots, gravel pits, or other areas where water runoff does not present an environmental concern.

The states' goal, as part of a regional strategy, is to build a multi-layered line of defense, first by intercepting fouled boats coming across state lines (within and outside of the

UMRB), and then providing additional protection closer to and within the UMRB. The states would continue to implement existing quality assurance and quality control (QA/QC) protocols in their inspection station programs and revise or adapt QA/QC protocols towards improved station efficacy during periods of strategy development, for example, partnering with local interest groups or universities to evaluate accuracy in following station protocols. It is recommended that states report their QA/QC results and include plans for improving QA/QC procedures, as necessary, in their annual scope of work review and/or submissions for cost share requests. USACE has deemed this strategy to be the most effective means of protecting all waters in the UMRB, including those maintained and operated by USACE. To focus only on preventive efforts inside the basin excludes a critical layer of protection.

The Recommended Alternative assumes the federal investment would augment state funds, resulting in increased effectiveness in the watercraft inspection program to decrease the risk of a dreissenid infestation. In accordance with the regional strategy, the states would use the data gathered during the inspection season to adjust the program to provide a more effective regional defense. With a BCR of 5.26 (derived as the most likely outcome protection projections from Table 16), USACE has determined that there is federal interest in partnering with the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska to address the vulnerability of the UMRB to a dreissenid infestation. The Recommended Alternative also includes inspection stations at federal facilities at infested lakes, regional data sharing efforts, real-time tracking of watercraft transportation and traffic pattern evaluation (measures 1-8 & 11-13).

9.2 MONITORING

Identification of water chemistry within the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska and comparison to water chemistry of infested water bodies could be used to inform risk management decisions within and outside the UMRB. Monitoring water bodies within the five UMRB states could provide early detection of dreissenids and facilitate rapid response measures to minimize infestation impacts. Therefore, monitoring in the UMRB is key to prevention efforts (measures 9-15).

9.3 CONTINGENCY PLANNING AND RAPID RESPONSE PLANS

Prevention remains the first priority for addressing the threat of dreissenid mussels in the UMRB. This includes keeping contaminated watercraft from entering uninfested water bodies in the basin. However, as prevention efforts fail, and live mussels continue to invade water bodies within the UMRB, advanced planning is needed to ensure an effective inter-jurisdictional response. USACE recommends the development of site-specific plans at the facilities using the facility vulnerability assessments conducted by Reclamation (2012; 2016; 2017a-g), with a focus on priority areas identified in the risk assessment matrix. USACE also recommends continued development of rapid response measures in coordination with the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska to find and eradicate dreissenids in the event an introduction occurs (measures 9-15).

Rapid response planning exercises provide opportunities for federal, state, and local agencies to prepare for a dreissenid invasion and go through the processes to develop action plans. These exercises, which are typically 2- to 5-day events, include developing invasion scenarios and responses, identifying response teams, and going through "dry run" scenario-driven exercises to improve planning and preparation to increase efficacy for when an actual invasion occurs .

Planning exercises have been occurring in the Columbia River Basin, and the Columbia River Basin Dreissenid Incident Response Toolkit (www.crbdirt.com) provides a valuable framework and suite of resources to improve rapid response efforts for the UMRB. The 100th Meridian Initiative of the Missouri River Basin AIS Team conducted a dreissenid-based rapid response exercise on September 8-9, 2021 at Fort Peck Reservoir, Montana in partnership with Montana Fish, Wildlife & Parks (FWP). The exercise was intended to explore the roles and responsibilities of FWP, the US Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (U.S. FWS), local Conservation Districts, Fort Peck Tribes and all other Montana or regionally responsible entities if faced with a dreissenid discovery in Fort Peck.

At the close of the exercise a brief conference call was held with the Missouri River Basin Multi-Agency Coordination (MAC) group. In this case the MAC included invitations to participate to leadership from Montana, North Dakota, South Dakota, Nebraska, Iowa, Kansas, Missouri, Minnesota, regional U.S. Fish and Wildlife Service, regional USACE, and the Department of Interior. The lead agency (FWP) provided a briefing of the situation and an outline of the proposed actions to the MAC.

Supplemental NEPA would be performed as necessary and appropriate to address the prescribed response treatment developed by the response team.

9.4 PUBLIC AWARENESS

As previously mentioned, public awareness about the seriousness of AIS is an important element of the ongoing efforts to prevent an introduction of dreissenids and further spread of other AIS within the UMRB. USACE recommends the following pertaining to public awareness (measure 7):

- Continue AIS ad campaigns, with collaboration among states, where possible, to obtain greater consistency and better recognition as boaters travel through the UMRB.
- Target outreach efforts to commercial boat haulers and other boat vector pathways such as boat brokers, auctions, online sale sites, and marinas with moored boats in infested hot spots such as the Lower Colorado River and Great Lakes. For example, PSMFC and partners including Idaho Department of Agriculture, Nevada Department of Wildlife, and others will be undertaking an outreach project in the coming year to provide messaging to these sources/haulers on the dreissenid issue and what they can do to reduce the risk of spreading dreissenids and lessen their chances of unknowingly (or knowingly) breaking state and federal laws.

- Increase efforts to communicate and work with boat manufacturers, especially to provide easy access to ballast water tanks on wakeboard boats, which would allow decontamination of water left in the ballast tanks.
- Continue to provide brochures, literature, and ads about AIS in state fishing and boating license applications and at recreational boating outlets and events.

Would require additional authority to implement:

9.5 WATERCRAFT INSPECTION STATIONS – IN OTHER STATES

USACE recommends that states adjacent to UMRB states implement similar or reciprocal laws governing watercraft movement from AIS-infested water bodies as Arizona Game and Fish Department Director's Order 3 – R09/18 (AZGFD 2018). Additionally, all watercraft inspection stations in states that border the UMRB should have mandatory inspections, especially at infested water bodies.

Considering the numerous access points at the Great Lakes, the establishment of the watercraft inspection program in that area may be impracticable or infeasible; however, there is still a need to inspect watercraft leaving the Great Lakes traveling to the UMRB. Performing regional inspections with a decontamination database system with standard protocols potentially could be a first step. This would allow the other states to accept the inspections and decontamination performed in other locations.

SECTION 10 - ROLES AND RESPONSIBILITIES

This section generally describes how the program would function. Upon review and approval of the LR/Programmatic EA, USACE will execute the Watercraft Inspection Program Project Partnership Agreement (PPA) with a non-federal sponsor in each basin, typically with a state or other organization(s) that represent several states. The non-federal sponsor may coordinate with and consider other entities' input on their program activities to reduce the risk of AIS within the basin including hydropower, hatchery, and marina facilities. While USACE may be involved in those discussions, the agency's primary relationship is with the non-federal sponsor(s) in the basin.

The Western Invasive Species Coordination Effort (WISCE) is a group of state AIS coordinators that collaborate to protect uninfested waters. The WISCE has expressed interest in providing a leadership role for implementing the Recommended Alternative and coordinating regional efforts among UMRB states with other Western states to provide the most effective and efficient use of federal cost-share funds to protect waters of the Western United States from a dreissenid infestation.

Upon receipt of the federal funds for the watercraft inspection program, USACE would send a letter to participating states, or their selected representative, asking for the statement of work for the upcoming season with the budget amount based on the federal funds available. USACE would then work with state AIS coordinators, or their representative, to draft a statement of work for each state that contains inspection station activities, and inspection station activities costs for the upcoming inspection season.

The term "inspection station activities" means the establishment, operation, and maintenance of new or existing watercraft inspection stations, including, but not limited to, the evaluation and selection of station locations, installation of stations, scheduling of daylight and night-time inspection hours, use of canine detection, increasing public awareness and education and other inspection enhancements, and constructing station site improvements, such as surface hardening, trailer pads, and utility connections, as generally described in this LR/Programmatic EA.

The term "inspection station activities costs" means all costs incurred following the date of execution of the statement of work by the USACE and states, in accordance with the terms of the PPA that are directly related to inspection station activities, including planning, engineering, design, establishment, O&M, related supervision and administration costs, and USACE costs of monitoring, inspection, and auditing of inspection stations activities.

During the statement of work preparation, USACE and the states would engage in an evaluation process to determine whether stations should be added, relocated, or closed, or if hours of operation should be adjusted. This evaluation process includes coordination among states and takes into account their specific budgets and statutory authorities, as well as collection data related to boat transportation traffic and fouled boat interceptions. To be considered for this cost-share program, the inspection

stations will be located in the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska, or near borders of neighboring states to the UMRB, and the stations must protect the UMRB and provide the highest likelihood of preventing the spread of aquatic invasive species at reservoirs operated and maintained by USACE.

USACE, with the states' assistance, shall complete all environmental compliance requirements, obtain all applicable licenses and necessary permits, and comply with applicable federal labor laws covering non-federal construction. The non-federal sponsor is responsible for ensuring that any real property or less-than-fee property interests acquired for the placement of a watercraft inspection station or related activity meet USACE Real Estate appraisal standards. Sponsors are encouraged to identify potential property purchases in their annual work plans so that USACE can provide guidance and insight on the documentation needed to help ensure reimbursement can be made. When using lands already within the State or Non-federal sponsors' control (fee or less than fee interests) they shall provide the real property interests required for the inspection station activities at no cost to the Government.

When site improvements are planned at an inspection station location that involves any ground disturbance, USACE may need to tier from this LR/Programmatic EA and complete site-specific NEPA analysis, depending on the nature and magnitude of proposed work and associated impacts. USACE would review any planned construction activities and the associated environmental compliance documentation before the construction activity is advertised for bids or executed with states' in-house labor forces. After the analysis is complete, the improvements would be allowed to proceed.

After the statement of work is finalized and approved by USACE, the statement of work will be signed by USACE. Signing the statement of work will obligate the funds to make them available for reimbursement.

No later than the 15th of each month, or as soon thereafter as practicable, the states shall submit properly executed and duly certified invoices covering inspection station activities performed during the preceding month. Appropriate documentation includes invoices and certification of specific payments to contractors, suppliers, and state employees that are performing inspection station activities. USACE shall review such documentation to determine and certify the inspection station activities costs as either allowable costs, not allowable costs, or costs that require additional supporting information. The submission must include sufficient information to support a determination by USACE that the costs are necessary to establish, operate, and maintain those inspection stations to protect the UMRB at locations with the highest likelihood of preventing the spread of AIS at reservoirs operated and maintained by USACE. Such written certification by USACE is required in order to support any payments under this authority. Following such certification, and subject to the availability of funding appropriated for watercraft inspection stations, USACE shall make payment in accordance with the authority and PPA.

Federal participation in the program would be dependent on the states continuing to fund the program and Congress specifically appropriating funds for the program. In 2019, expenditures by the states totaled about $1.3 million within the UMRB and about $1.1 million outside the UMRB. Although individual state budgets fluctuate annually, the initial estimated annual cost to the federal government to fully participate in the program would be about $5.9 million within the UMRB and about $2 million outside the UMRB. This number may increase if risks increase, or it may decrease, or the program may be eliminated if an infestation becomes established within the UMRB.

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