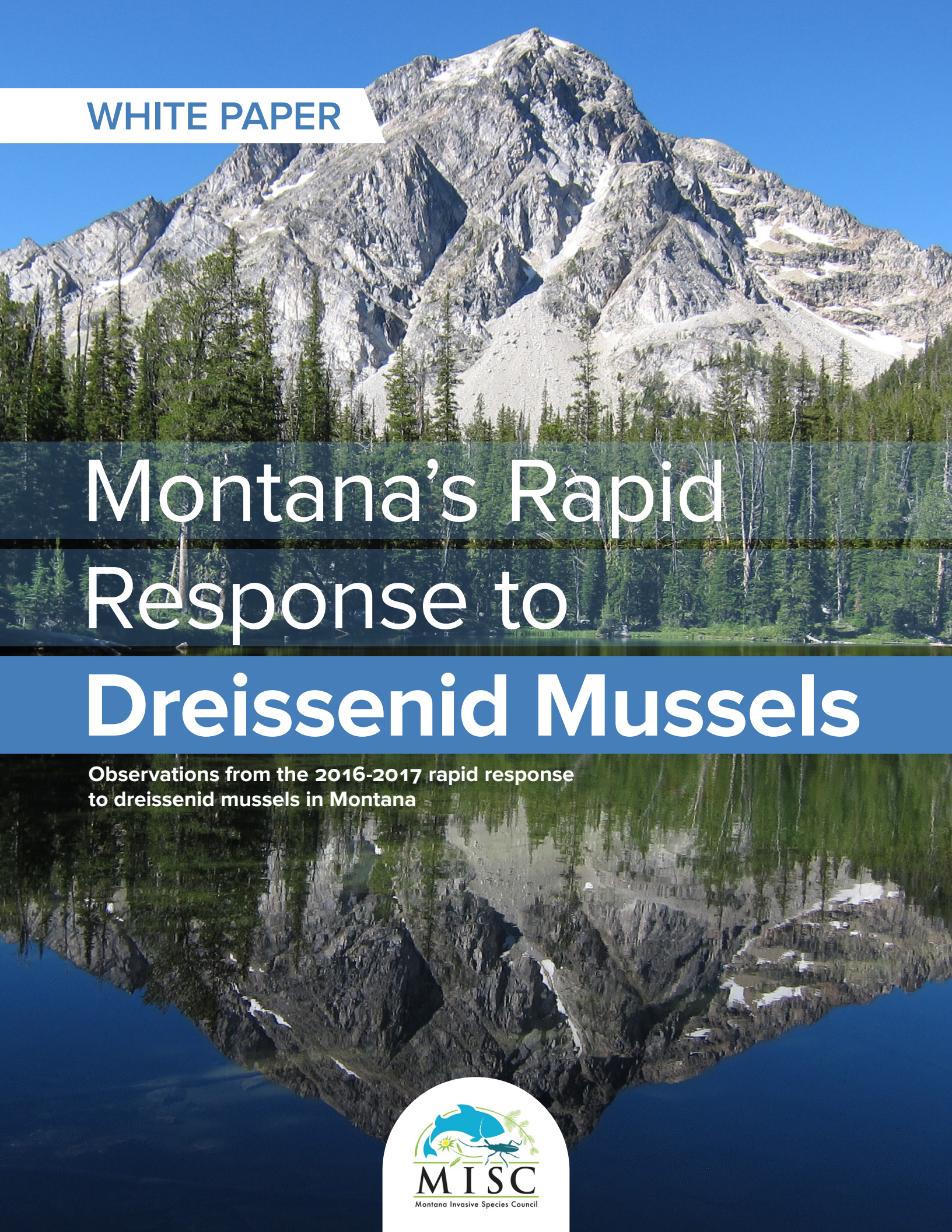
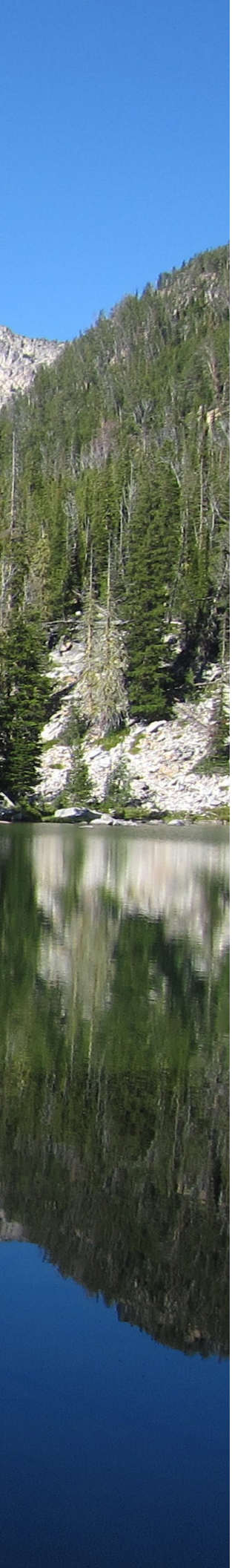


WHITE PAPER

Montana's Rapid Response to Dreissenid Mussels

Observations from the 2016-2017 rapid response to dreissenid mussels in Montana

MISC
Montana Invasive Species Council



WHITE PAPER: MONTANA'S RAPID RESPONSE TO DREISENID MUSSELS

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Montana Fish, Wildlife & Parks unless otherwise noted.
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Page 3, Eastern Montana photo by Gary Adams, MISAC 2014-2016.

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We would like to thank all those who contributed to the 2016-2017 dreissenid mussel rapid response. This white paper is based on interviews with the following individuals who shared their experience:

- Randy Arnold, Montana Fish, Wildlife & Parks
- Justin Bush, Washington Invasive Species Council Executive Coordinator
- Bryce Christaens, Missoula County Weed District Manager & Montana Invasive Species Council (MISC) Chair
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- Steve Wanderaas, MISC Member
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Funding for this White Paper was provided by the National Invasive Species Council. This paper reviews the Montana 2016-2017 dreissenid mussel response successes and challenges. Our goal is to provide insight for future Early Detection & Rapid Response efforts.

EXECUTIVE SUMMARY

Eastern Montana

THE FIRST DETECTION of dreissenid mussels in Montana waters in 2016 dramatically transformed the aquatic invasive species program. For almost two decades prior to the discovery, Montana had actively participated in regional partnerships that anticipated the spread of mussels west from the Great Lakes Basin and other waters where they are widely established. Regional plans including the Columbia River Basin Interagency Invasive Species Response Plan guided Montana's response following the mussel detection. The unfolding state response required more detailed plans than the regional documents provided and highlighted the need for stepped-down planning to facilitate rapid response. The awareness that Montana was at high risk of mussels establishing in state waters was known to the natural resource agencies but general awareness and urgency was lower among stakeholders as the nearest mussel populations were still several states away. The lower population density and lack of awareness of the threat posed by mussels to the agricultural water users in the eastern and central region contributed to fewer watercraft inspection stations along the eastern perimeter of the state creating a gap in prevention efforts. Annual sampling for mussels had previously confirmed of their absence. In October 2016, a mussel detection was confirmed in a sample collected in July. Pressure from local and regional partners for a comprehensive response led to the establishment of a joint command using Incident Command System. The rapid response was funded via an emergency declaration that provided an initial $750,000 then an additional $200,000 to support the rapid response from the Governor's emergency fund. A scaled-up management plan transitioned operations from rapid response to management and funding was allocated by the legislature during early 2017. This plan and authorization tripled the size of the existing program allowing for more watercraft inspection, monitoring, and grants to partners including tribes, watershed

coalitions and conservation districts. The new larger program is more inclusive, better funded, and has encouraged a broader adoption of incident command training, stronger interagency and non-governmental cooperation, and more inclusive communication with stakeholders.

Montana at the Headwaters

The Missouri flows east and Columbia River watersheds flow west from the Rocky Mountains at the Continental Divide and the Saint Mary River runs north and east to Hudson Bay from the Triple Divide Peak in Glacier National Park. Montana holds the headwaters for these rivers and is proud of its stewardship of the 11,000 individual waterways in Montana[1].

The communities and industry in Montana, as with much of the west, are founded on the distribution of water. In 1903, the U.S. Congress authorized construction of the Milk River Project as one of the first five reclamation projects built by the newly created Reclamation Service (now the Bureau of Reclamation) under the Reclamation Act of 1902[2]. Since then the rivers have been managed and developed as a state and regional resource and continue to be treasured for their beauty and wildlife.

Early Detection and Rapid Response

The spread of dreissenid mussels (collectively this will refer to the zebra mussel, *Dreissena polymorpha* and quagga mussel, *Dreissena bugensis)* across the United States has been well documented and efforts to share knowledge about effective prevention tools and policies, containment practices, and detection methods have been the focus for national aquatic invasive species efforts. Montana had been monitoring for mussels and participating in regional efforts to stop the spread since 1998. On October 17, 2016 dreissenid mussel larvae were identified from Montana samples taken earlier in the year at Tiber Reservoir. Subsequently, Canyon Ferry Reservoir tested suspect for dreissenid mussel larvae.

Governor Steve Bullock issued an executive order November 30, 2016 declaring a statewide natural resource emergency for Montana water bodies due to the first detection of invasive dreissenid mussel larvae in state waters. The State of Montana's Mussel Response Team was formed to rapidly assess the extent of the mussel populations in Montana's waters. The team organized under incident command system and managed a coordinated response. As the response transitioned to management by March 2017 they developed a list of suggestions for a long-term strategy to mitigate economic and ecological damage.

1 Montana River Action. Web. 10 July 2018.

2 Montana Watercourse. *What is the History of Water Planning in Montana?* April 2015. Montana Department of Natural Resources Conservation. Web. 14 June 2018.

1997

Western Regional Panel (WRP) on Aquatic Nuisance Species

The initial, organizational meeting of the Western Regional Panel was held at Portland State University in 1997 and Montana is a part of this panel.

1999

Bonneville Power Administration (BPA), recognizing the potential impact to its operations, funded the Pacific States Marine Fisheries Commission (PSMFC) to carry out an ANS prevention program for the Columbia River Basin (CRB).

The PSMFC has also provided funding to Montana to conduct Boat User Surveys and install Traveler Information Systems (TIS) in the state. One of the goals of this regional program is to include ANS outreach and inspection in Montana, Washington, Idaho, and Wyoming.

2002

The Montana Aquatic Nuisance (ANS) Management Plan is finalized. Budget for FY03 for combined state and federal spending on AIS is $808,500

Montana Aquatic Nuisance Species (ANS) Technical Committee, a subgroup of the Montana ANS Steering Committee produces the first statewide aquatic invasive species plan which identified dressenid mussels as Priority Class 1 species, not currently known to be present in Montana, but have a high potential to invade.

2004

AIS Coordinator hired in Fish, Wildlife & Parks

2008

Montana is a signatory to the Columbia River Basin Interagency Invasive Species Response Plan: Zebra Mussels and Other Dreissenid Species

Montana Fish Wildlife & Parks is part of a notification structure for Dreissenid response and reporting. The plan utilizes an Incident Command Structure and is designed to initiate a coordinated response among states and agencies in the Columbia River Basin.

2010

"Inspect, Clean, Dry campaign" launched.

This campaign provides outreach to Montana boaters about the importance of cleaning their watercraft and gear. A follow-up survey in 2012 indicates that anglers and boaters are increasingly cognizant of the threat of aquatic hitchhikers and increased frequency boat- and gear-cleaning among anglers.

2011

Columbia River Basin partners Rapid Response Exercise in Libby, MT

The goals of the table-top exercise were to increase coordination between the US and Canada as per the Columbia River Response Plan, and to further develop a containment strategy for watercraft moving in and out of an infested waterbody.

2014

Montana Aquatic Invasive Species Conference hosted by Fish Wildlife and Parks

This was a two-day, panel-style conference attended by 80 AIS partners. This event generated in-depth discussions about coordination, law enforcement, outreach and education, future needs, and other critical AIS topics.

Montana Invasive Species Council, FY 15 combined state and federal AIS spending is $2,534,993

Governor Bullock signed Executive Order No. 13-2014 creating the Montana Invasive Species Advisory Council (MISAC) on December 4, 2014. The council is comprised of twenty-one members, appointed by the governor.

2016

Invasive mussel larvae detected in Montana.

A positive sample of invasive mussel veligers at Tiber Reservoir and a suspect sample at Canyon Ferry Reservoir were identified on October 17. The first detection was from Bureau of Reclamation samples. Montana Fish Wildlife & Parks samples which also tested positive at Tiber were processed days later.

2017

Legislative approval of expanded funding for AIS to $13.2 million.

Overall monitoring and early detection efforts increased steadily in the preceding years but nearly tripled between 2016 and 2017.

2018

The Central and Eastern Montana Mussel Response Team was formed.

Partnerships to address mussels in the eastern watersheds of Montana allow the statewide AIS program to incorporate locally unique stakeholders and increased pass-through funding from state agencies fosters active collaborations and expanded effort.

How prepared was Montana for the 2016 mussel detection?

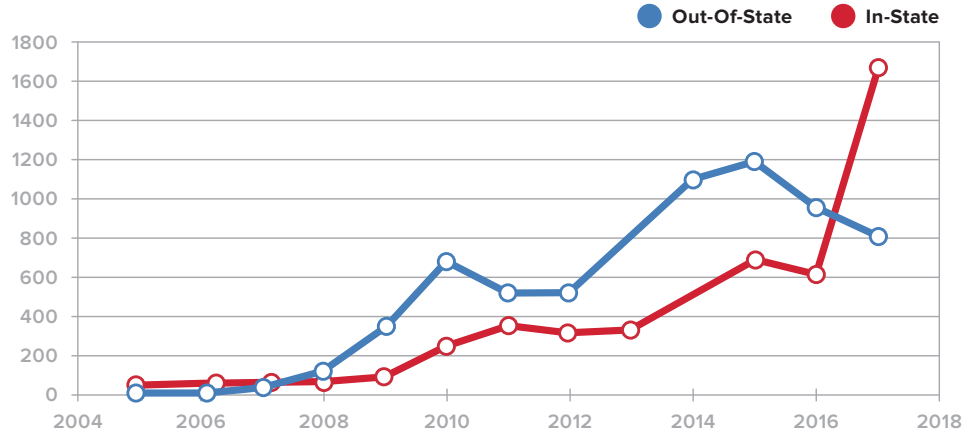
From the Montana Aquatic nuisance Species Management Plan 2002

Aquatic Nuisance Species (ANS) are a serious problem in Montana. There are currently over 70 nonindigenous aquatic species reported in the state and more are expected to arrive. Current state activities and authorities address some ANS, their prevention, and control. However, these activities are not coordinated nor comprehensively managing the impacts of ANS. The importance of Montana's aquatic resources requires a coherent response to the threat posed by ANS. This management plan is the initial step in establishing a program in Montana to specifically address ANS issues.[3]

The 2002 Montana Aquatic Nuisance Species plan included an outline of the strategies and resources needed to prevent the introduction of dreissenid mussels. The Montana Fish, Wildlife & Parks (FWP) Aquatic Invasive Species Program worked to implement the Aquatic Invasive Species (formerly Aquatic Nuisance Species) Management Plan through coordination and collaboration, prevention of new AIS introductions, early detection and monitoring, control and eradication, and outreach and education.

Montana's Aquatic Invasive Species (AIS) early detection and monitoring program was established in 2004. Montana FWP biologists prioritized monitoring and prevention for dreissenids as well as other priority aquatic invasive species including: New Zealand mudsnails, Eurasian watermilfoil, flowering rush, and curlyleaf pondweed, as well as other species not known to occur in Montana. Plankton sampling for both dressenid and Asian clam veligers (microscopic larvae) increased each year, in part due to an increase in volunteer sampling efforts as well as increasing agency staff effort.

Figure 1: Number of plankton samples processed by year: in-state vs. out-of-state. Adapted from the original.[4]



3 Aquatic Nuisance Species Steering Committee. *Montana Aquatic Nuisance Species (ANS) Management Plan.* By the Montana Aquatic Nuisance Species (ANS) Technical Committee. 2002. *Montana Fish Wildlife & Parks AIS Resources* Web. 30 May 2018.

4 Montana Fish Wildlife and Parks. *2017 Report on Aquatic Invasive Species Monitoring*. January 2018. By Stacy Schmidt and Craig McLane. *Montana Fish Wildlife & Parks AIS Resources* Web. 26 July 2018

Plankton samples are examined under a microscope for dressenid veligers (microscopic larvae)

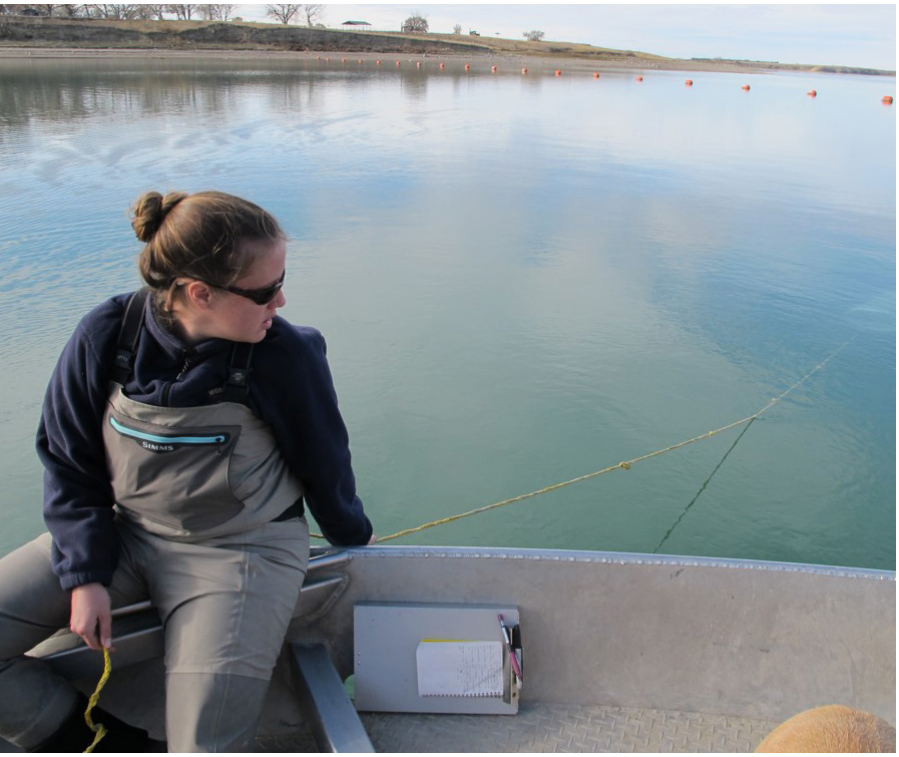
The populations of mussels nearest to Montana in 2016 were one state away as neighboring Idaho, Wyoming, and North Dakota did not have established mussel populations. Downstream states including far south east South Dakota and Nebraska did have established populations. Because there was a buffer, the sense of urgency among many recreational users and some managers was lower than warranted by the threat posed by the introduction of mussels. Stakeholder groups including watershed partnerships did discuss mussels, but attention was on immediate concerns including water quality and stream restoration, water quantity and drought.

In 2016, the Montana FWP Aquatic Invasive Species program had five permanent staff conducting early detection and monitoring surveys in addition to their other duties. Seasonally, Montana FWP hired about 65 watercraft inspectors to staff 12[5] stations located across the state. Roughly fifteen of those inspectors worked at roving locations to improve coverage and respond to boater traffic and address known gaps in coverage especially in the eastern Montana watersheds. Part of those inspectors' duties was to collect plankton samples from each location they visited. In 2016, a total of 135 waterbodies, 499 unique sites and 581 total sites were inspected in Montana.[6] Partner agencies including the Bureau of Reclamation submitted in-state samples for testing to the FWP Aquatic Invasive Species lab in Helena as well.

On October 17, 2016 the Bureau of Reclamation identified a dreissenid veliger in Tiber Reservoir samples taken earlier in the year. Ongoing analysis through the FWP lab prioritized Tiber

5 Tom Woolf, April 18, 2018.

6 Montana Fish Wildlife and Parks. *2016 Report on Aquatic Invasive Species Monitoring*. January 2017. By Stacy Schmidt and Craig McLane 2017. *Montana Fish Wildlife & Parks AIS Resources* Web. 30 May 2018.



Plankton sampling in Tiber Reservoir

samples and the July 16 & 17, 2016 samples confirmed the detection. As additional high priority samples were processed, a second veliger was found in a sample on October 26 collected from Canyon Ferry near Helena on August 16. The lag in processing samples was recognized as Montana received an increasing number of samples from neighboring states as well as in-state samples. A FWP 2015-2016 annual report observed that the Aquatic Invasive Species laboratory was over its capacity to process samples in a timely manner. Steps had already been taken starting in the winter of 2015 to address the gap by adding a permanent staff member in laboratory sample processing techniques in Helena and establishing a secondary Aquatic Invasive Species lab in Kalispell, Montana.

Once veligers were found in the samples, the water conditions in the suspect waters were too cold to support swimming veligers, making re-sampling to confirm the positive result with plankton tows less effective. As shoreline and structure sampling in response to the veliger detections proceeded, no adult mussels were found and it was determined that mussels were likely detected early. As the late fall also coincides with a decrease in the number of water users the response initially followed an internal FWP protocol for establishing an incident command-based structure within the agency to manage the response. Additional sampling was planned and scheduled to occur as possible during the winter and as waters became ice-free again in spring.

When the Montana FWP Aquatic Invasive Species Laboratories in Helena identified the first set of samples as positive for dreissenid mussels, the recommended verification steps as agreed in the Aquatic Invasive Species Western Regional Panel's 2014 meetings was used; the samples were sent to a second lab and additional samples were collected. In table-top exercises for rapid response in Montana and regionally, the trigger to initiate action has been given as "mussels were found." The more complex reality is that an initial positive result triggered the need to follow up which takes days or weeks. When the initial results were released, the inherent delay created by the process of collection and testing created pressure to begin taking actions beyond those identified in the verification protocol.

An early challenge following the spread of the news of the detection outside of FWP was to reconcile the differing views on how to organize a response that was appropriate in scope. Existing FWP staff did not have the capacity to address all of the concerns identified by

regional partners that included the broader implications of mussels establishing adjacent to the Columbia headwaters, and the socio-economic impacts within the state. There was also frustration by stakeholders and fellow agencies about the limited nature of the response given the threat posed by mussels. Calls came for the response to be shifted away from FWP. Requests to immediately increase in-state containment efforts to keep the possible population of mussels from being transported over the Continental Divide to the Columbia River system could not be addressed with existing resources and pressure built to mobilize emergency funds. The demand to expand the program to address additional mussel containment, increase state-wide watercraft inspections, expand monitoring, and increase education would require not only more resources but the involvement of many additional partners over the course of a few weeks.

Existing planning will be adapted during a response.

The understanding of what constitutes an Incident Command System response varied between agencies. In August 2016, prior to the dreissenid mussels being identified, the Montana FWP responded to a large fish kill (the Whitefish Parasite Kill) on the Yellowstone River. The Montana Invasive Species Council (MISC) followed the response and due to the number of parties impacted by closures and the federal and state jurisdictions over the area they recommended using Incident Command. The agency responded that they were using incident command to guide their response but it was internal to the agency. However, core elements of an incident response including a communications plan and an after-action report to review and evaluate the steps taken during the response were not carried out, limiting both partner engagement and the ability to learn from the response. Based on this experience there was a background of frustration and lower levels of trust for a single-agency response.

Trained mussel detector dogs used to inspect boats were tasked with shoreline searches for adult mussels during the response

The mussels detections were officially shared by Montana FWP with the Montana Department of Natural Resources Conservation about 11 days after the initial results. At this time there were operations underway to survey the

suspect areas and take additional samples. Regional participation and good standing relationships with the Alberta Environment and Parks staff facilitated the arrival of mussel detector dogs that typically work on watercraft inspections. The dogs were able to adapt to searching docks and shorelines in Tiber Reservoir. Dive teams from the US Fish & Wildlife Service offered assistance. While the dive and dog teams were in place, boats launched at the marinas of the suspect waters raising concerns among the managers working at the sites that the level of the response was not well matched to the threat posed by a new population so close to the Columbia headwaters. There was frustration outside the agency with the channelized and closed nature of the decision-making and the perceived increased risk to other water resources in Montana from a limited response to the mussel discovery. On November 30, 2016 the Governor of Montana issued an "Executive Order Proclaiming an Invasive Species Emergency to Exist in the State of Montana" (Appendix: Montana Executive Order 18-2016) which released both emergency funds and facilitated the formation of an incident command team.

The authority for the response was transferred to the Incident Command Team away from the FWP staff who had been organizing the response in coordination with MISC. These staff that were initially leading the response and following the internal response protocol were not initially included in the command team. As the decision making for the response was shifted to a command team, there was frustration within FWP as the response was under their regulatory authority and due to the exclusion of agency staff from leadership of the response. With the political pressure growing to approach the response aggressively, the planning and training that had taken place was adapted to meet new expectations.

Initiating Incident Command System

Initiating a Joint Incident Command allowed the rapidly expanding mussel detection response to be addressed in an organized way. Staff with experience in emergency response from outside the natural resources agencies who had the skills to train others in incident response were recruited to join the team. Biologists with expertise in the region, aquatic invasions, and sampling both within the agency and from other jurisdictions who volunteered, were not always included leading to frustration among stakeholders who had pushed for greater involvement in the response when it was under a single agency's management. Local stakeholders understood the need for outside assistance, but skepticism of outside management was widespread. A lack of familiarity with incident response including the difference between the strategic management of the incident vs. the tactics that would provide the best outcome for dreissenid containment fed this frustration.

The residents, stakeholders, and agency staff in Liberty County where Tiber Reservoir is located along with the City of Great Falls just south of the response area were engaged and invested in both the outcome and in reducing the response impacts to their resources. Neighboring regions to the west of the Divide including the Flathead Lake, the largest lake in the state, were watching closely. Areas outside the containment region recognized the increased risk to their

recourses and with the Flathead Lake partnerships advocated for additional layers of prevention including in-state watercraft inspections to prevent movement of mussels across the Continental Divide from the Missouri Basin to the Columbia. New stakeholders including the Montana Association of Ditches and Canals and the Association of Conservation Districts with their strong ties to the irrigators and agricultural operations began to follow the response as the risk of damage to their infrastructure by mussels became more broadly understood. Statewide communications tools had been used for several years but these new stakeholders who were following the response had not previously interacted with the natural resources agencies on aquatic invasive species issues. The layered and multi-channeled communications set up by the response were widely praised for making the response inclusive of diverse stakeholders.

One of the most valuable outcomes of the response for natural resources managers were connections with different sets of constituents including the irrigators. The subsequent development of extensive phone-trees for notification, expanded roles for Conservation Districts to connect with agricultural and rural water infrastructure operators has positively influenced planning for resource related emergencies on a watershed scale. The notifications and forums set up by the incident response joint communications were repeatedly identified as helpful, and a core reason given for increased trust in the command team (and incident response more generally), and Montana's ability to effectively respond to mussels.

The science advisory panel meets in support of the rapid response

While the frequent updates from the communications team received positive feedback, the rapid pace supported (and anticipated) by an Incident Command System response frustrated some of the biologists and managers interacting with the command team. A natural resources response has inherent lags in collecting information from the field about the status of the species being targeted. Examining the schedule for the incident and scaling back repeating tasks, meetings, and briefings from the prescribed schedule used in wildfires and adjusting manuals and trainings appropriately would improve future responses as increased adoption of incident command in natural resource agencies grows.

The three months of incident response operations expended the initial $750,000 that was provided from Montana's emergency funds when the Emergency Declaration was signed. The Montana Legislature passed House Bill 4 to provide an additional $200,000 during the winter when command team operations were still underway. The mechanisms to expend the funds included cooperating agreements and overtime approvals that required significant time from

agency fiscal staff. Integrating Montana FWP fiscal and administrative staff into the structure of the Incident Command Team was strongly recommended by those involved.

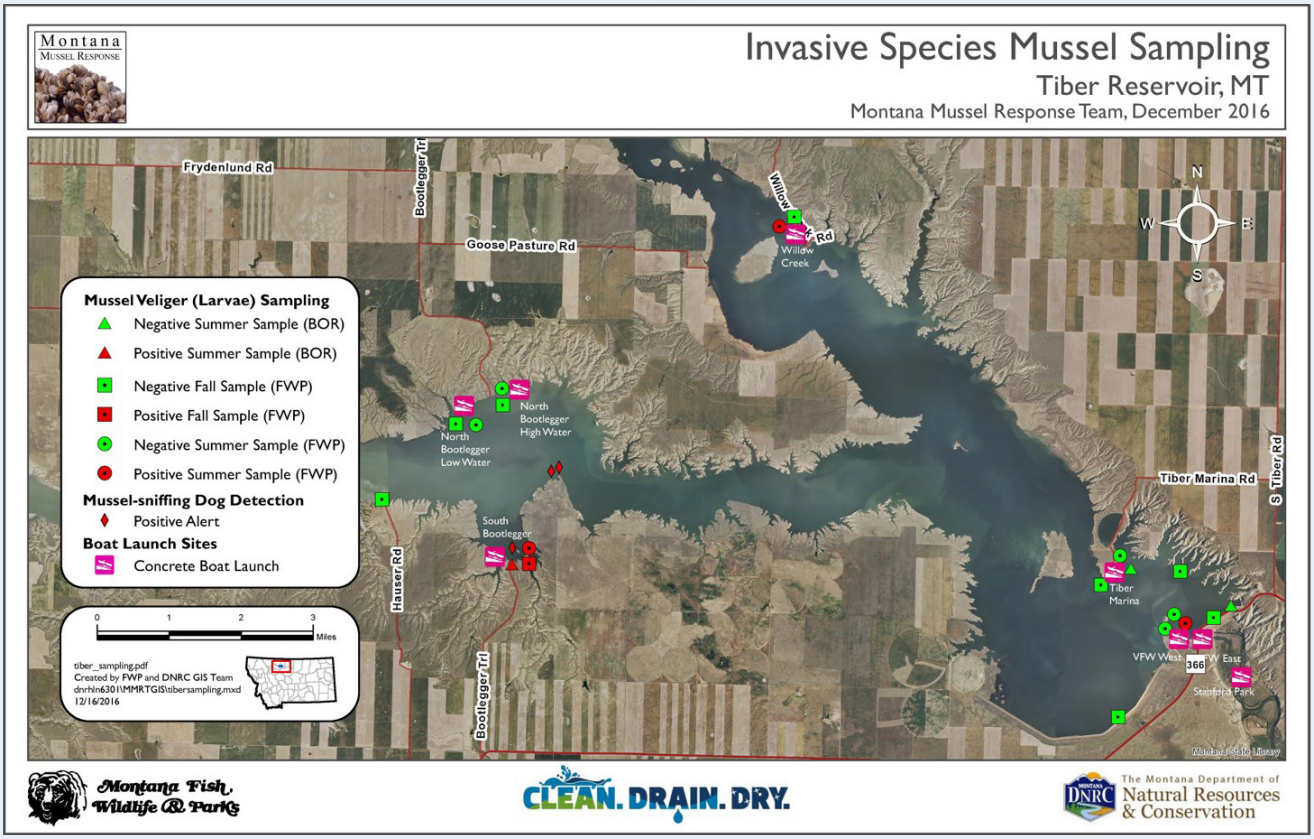
What state resources and planning were changed by the response?

Prior to the response, MISC was established by Executive Order and was re-formed under statute in early 2017. The new law additionally requires MISC to report to the Interim Committee for the Environmental Quality Council. The reporting requirement provides a forum to discuss invasive species issues with decision makers that did not previously exist. The Council can review and collect agency and stakeholder reports and keep the legislature informed about emerging threats and response outcomes.

The capacity to use Incident Command System depends on trained staff and FWP has hired a contractor to both train staff and integrate Incident Command into response pre-planning. Subsequent natural resources responses have used Incident Command System in part due to familiarity with the operations during the mussel response.

After the 2016-2017 dreissenid rapid response, FWP used Incident Command System to organize a response to a Chronic Wasting Disease detection and included a command post, press releases, pre-identified staff for an effort that unfolded quickly. The motivation for implementing incident command came partly from the increased familiarity due to the media and staff communication about the dreissenid response but also from agency leadership who had been involved in the dreissenid response and promoted Incident Command System training and rapid response planning internally to their agencies. While invasive species are not usually part of the Montana Department of Livestock's docket, another invasive species rapid response was mounted after the detection of feral hogs in northeast Montana. Incident command was used as the sightings are being investigated by US Department of Agriculture, Animal and Plant Health Inspection Service (USDA APHIS), Wildlife Services in partnership with Department of Livestock. The use of Incident Command for coordinating across multiple tiers of government and split authorities was seen as very useful. Another benefit described was encouraging staff to not get bogged down in tactics before the response strategy to the complex challenge of this feral animal had been identified.

Following the 2016 response, there have been more rapid response table top exercises including forest pests led by USDA APHIS Rapid Response Team expert Gary Adams. More are planned including tabletop response exercises for mussel detections in Flathead Lake (September 11, 2018), Fort Peck (August 28, 2018), and downstream states. The use of Incident Command System for natural resources is recognized as being different from all-hazards or emergency response training as natural resources responses are (usually) slower moving with a longer planning horizon. Creating a specialized set of training opportunities for biological responses



Dreissenid mussel plankton and shoreline sampling sites for Tiber Reservoir

will improve readiness and reduce the burden on fire and other emergency staff. Montana's experience was that incident command is a fundamentally useful tool for bridging both differences in agency culture and sharing authorizes necessary for a successful response. Training is needed to both improve familiarity with the Incident Command process and identify partners in advance. MISC is currently working with the Montana Disaster and Emergency Services and other state agencies to develop an all-hazards training curriculum and identify appropriate staff to complete the training.

The debate on whether or not Montana was using the most current and relevant science during a rapid response led to a directive in statue to create a Scientific Advisory Panel under MISC. The Panel evaluates and reports out on the best practices. One of their first products was a white paper on eDNA (environmental DNA samples) for use in identifying mussel presence in waterbodies.

MISC is evaluating the need for a generalized rapid response plan for Montana that would identify how to structure the decision making for new invasive species detection and scale the responses appropriately. Once there is an all-taxa plan in place, practicing it to build confidence and develop Incident Command skills will help identify the gaps that exist in the preparations

for new or as yet unknown invasive species. The level of invasive species awareness among many non-traditional stakeholders was increased by the mussel response setting the stage for planning to include more partners in future responses.

Adapting Incident Command System for Natural Resources

Initiating Incident Command is a political decision, so is scope.

Whether or not an invasive species is an emergency that warrants a rapid response can be anticipated for a subset of high risk, priority species. Even for these species, and most other new species detections, the scope of the response is a policy issue. This is true whether or not Incident Command System is used to manage the response. Incident Command System is a tool for organization that can support a rapidly moving response while the scale of the response is determined. One factor increasing resources prioritized for the initial response is that decision makers recognize that they are faulted for not making a robust initial response. A response which can later be scaled back is less likely to be criticized than a "wait and see" approach. As all rapid responses happen in a complex, local context of resources, priorities, environmental, and biological considerations the framework for making the decision to initiate rapid response should be flexible and clearly identify the objectives for a response.

An after action review was conducted once the rapid response phase concluded to identify areas for improvement for the next response

Integration is an art.

When invasive species experts who have not been trained in Incident Command System participate in a response there is a reasonable skepticism that the assigned command team staff from outside of the field can be effective. A dual approach that involves both on the fly incident response training for partners and stakeholders on one side, and careful selection of an Incident Commander and the Operations Chief from the discipline involved in the response on the other, shores up confidence. The trust in the effectiveness of the Incident Command tool is improved with understanding of its benefits and limitations, which can come from training or better yet, practice. The use of a Technical Advisory Group to inform the Operations of an incident can be beneficial for complex situations and can be drawn from experts in the discipline on an ad hoc basis. Formation of the Technical Advisory Group also strengthens ties to key stakeholders.

Beyond response, what else can be learned from fire-based ICS planning?

The difficulty involved in identifying and assembling resources quickly was one of the first barriers identified by the incident managers working on the 2016 response. Useful new tools including a GIS based map of water access points based on an incident resources information support tool developed by railroad operators for their emergency response along their right of ways is in progress in Montana. When stepped-down state or local plans are developed based on regional documents like the Columbia River Basin Interagency Invasive Species Response Plan, including inventories based on the example of fire caches (if not the physical stockpiling of equipment) would reduce the barriers to response. While the equipment needed for a biological response will very likely be in seasonal use and not held in a dedicated facility as is the case for fires or oil spill response, listing the equipment and staff along with the regional office where the resources are located will facilitate the initiation of rapid response operations.

State transitions from rapid response to management

The Montana aquatic invasive species program operating funds before the 2016 dreissenid mussel response were about $2.1m/biennium and expanded to $13.2 m/biennium. As the rapid response concluded and operations shifted to longer-term management after three intensive months the state invasive species coordinator and members of the mussel response team and then Montana Invasive Species Advisory Council drafted a long term plan that identified programmatic gaps and enhancements that were needed to protect Montana's waters from mussels. This was also one of the first opportunities for the Montana Invasive Species Advisory Council to collect agency and stakeholder reports and inform the legislators serving on the Interim Committee for the Environmental Quality Council. The expanded aquatic invasive species management plan was presented to the legislature and was a comparatively large request from the agencies. The question the legislature came back with was, "Is this enough to protect Montana?" and approved the funding increase that supports all aspects of invasive species management from prevention through control. The Montana Invasive Species Advisory Council previously established by an Executive Order was re-formed under statute and became the MISC. As a follow up on to the expanded funding, an economic analysis conducted in 2018 is reviewing the threat to Montana's resources and infrastructure by invasive species and whether or not the current level of investment is adequate.

> *Having the 2016 mussel response occur during the Legislative Session was critical especially as Montana's legislature meets for 90 days in odd numbered years. There were only 6 months left in the fiscal biennium in which the response occurred and adequate funding was not available through the agencies with the authority to response. Access to the Governor's emergency fund allowed 20*

days of rapid response but extension would have required a legislative approval process. Because the detections occurred immediately prior to the onset of winter and during session, there was a process to authorize funding and authorities quickly that would not have been possible in other years or in a different time of year. For future rapid responses, the duration of emergency funding availability could prove to be a substantial constraint.

The broad impact of dressenid mussels on infrastructure increased the stakeholders for aquatic invasive species management. Prior to the detection of mussels, agricultural groups including irrigators and water supply managers were not the targets of invasive species outreach and prevention messages. Both out of state and local boaters were the main audience for outreach and regulations in an effort to reduce the transport of target invasive species. As a result of the response, authorities shifted as well. Out of state boaters must be inspected which also requires more outreach and staff. New collaborators in aquatic invasive species management, especially in Eastern Montana, are now included in regional watershed management discussions and aquatic invasive species detection and prevention, facilitated by grant funded regional coordinators.

Finding out that we didn't know what we didn't know.

Including a plan to access or release data during rapid response will aid in operations. Due to the complexity of protecting individual's information while making key maps and inventories available to the response organizers requires clear policies. For example, the Department of Natural Resources Conservation maintained maps of irrigation water users but the county-based Conservation Districts that were in regular contact with these water system operators and agricultural users did not have access to the maps or know that they had been made. The distribution and use of state-held information about privately held property is sensitive but releasing the locations of key infrastructure for emergency management can be made in advance with appropriate safeguards.

Additional stakeholders were identified as the mussel response progressed. Past efforts to identify infrastructure that was vulnerable to mussels had generally identified irrigators but these water users had not been included in mussel outreach. Conservation Districts and other county level partners already working in the area provided a channel for communication between the state agencies with the materials and information and the water users. Eastern Montana cooperators identified oil and gas fracking operations as moving substantial volumes of surface water creating a possible pathway for moving mussels that had not been previously taken into account.

Communication, more communication.

The transition from rapid response to management required defining new clear goals and increasing agency capacity to meet those goals but most importantly, reassuring the coalition of partners involved and invested in the response that dreissenid management remained a priority

and would be successfully carried out as the joint command was demobilized. Communicating these goals and setting these new expectations in line with management is proceeding through stakeholder meetings, regional working groups, and updates from the agencies via mailing lists. Increased funding through Montana FWP has developed a partnership model that includes funding tribes and conservation districts to provide the man power for inspection stations and increased outreach.

Both the experience of collaborating during the response and the trust built by the higher level of communication provided by the joint communications team have strengthened ongoing partnerships. Response plans previously identified tribes, federal, regional, and local classes of contacts that should be informed but the specific "phone-trees" with positions, names, and direct contact information developed during the response are now incorporated into the stepped-down response plans that support successful local responses to invasive species.

Appendix: State of Montana, Office of the Governor, Executive Order No. 18-2016: Executive Order Proclaiming an Invasive Species Emergency to Exist in the State of Montana.

Appendix

STATE OF MONTANA
OFFICE OF THE GOVERNOR
EXECUTIVE ORDER No. 18-2016

EXECUTIVE ORDER PROCLAIMING AN INVASIVE SPECIES EMERGENCY TO EXIST IN THE STATE OF MONTANA

WHEREAS, invasive *Dreissenid* mussel larvae, commonly referred to as zebra and quagga mussels, have been detected in bodies of water in the State of Montana;

WHEREAS, the existence and spread of invasive *Dreissenid* mussels within waters of the State of Montana poses a significant threat to the natural resources of the state;

WHEREAS, invasive aquatic species comprise a grave threat to the waters and economic resources within the State of Montana, and such introduced species are best controlled when experts take management measures quickly after their introduction is discovered;

WHEREAS, the Department of Fish Wildlife and Parks and the Department of Natural Resources and Conservation both have responsibility for control, containment, and prevention of introduction and spread of aquatic invasive species;

WHEREAS, the coordination of a rapid response effort to address this issue is of utmost importance to the State of Montana;

WHEREAS, response resources from these and other agencies are currently working on management strategies;

WHEREAS, under these conditions, the Directors of both agencies have the authority to direct the personnel within their departments to commit time, personnel, funding and resources to meet the requirements and contingencies that may arise from this emergency; and

WHEREAS, the Governor has authority under Mont. Code Ann. 80-7-1013(1) to declare an invasive species emergency and may spend funds to meet needs that arise from this emergency pursuant to Mont. Code Ann. 10-3-302 and 312, and take other necessary action.

NOW, THEREFORE, I, STEVE BULLOCK, Governor of the State of Montana, pursuant to the authority vested in me as Governor under the Constitution and the laws of the State of Montana, do hereby declare that an invasive species emergency exists, as defined in Mont. Code Ann. 80-7-1013, and direct as follows;

1) The Directors of the Departments of Fish, Wildlife and Parks and Natural Resources and Conservation shall develop an Incident Management Organization to manage the State of Montana's response to this Invasive Species Emergency; and

2) All Directors of other Departments of the State of Montana shall fully cooperate with the Incident Management Organization.

This Order is effective immediately.

GIVEN under my hand and the GREAT SEAL of the State of Montana this 30 day of November, 2016.

STEVE BULLOCK, Governor

ATTEST:

LINDA MCCULLOCH, Secretary of State

FOR: