Rapid Response Plan Following Detection of Dreissenid Mussels in Palisades Reservoir, Wyoming

Jackson Regional Fisheries Management Crew, Wyoming Game and Fish Department, 420 N. Cache Street, Jackson, WY 83001

SUMMARY

Palisades Reservoir is formed by Palisades Dam on the Snake River in Idaho. It impounds up to 1.2 million acre-feet of water from the Snake, Salt, and Greys rivers. Palisades Reservoir was completed as the core of the United States Bureau of Reclamation's Palisades Project and provides irrigation water, flood control, and produces hydroelectric power from four turbines. Most of the produced power is used to pump water in the Minidoka Project, and the surplus is sold on the open market. The town of Alpine, WY sits at the head of the reservoir, while the town of Palisades, ID is located just downstream of the dam.

Depending on the water year, the reservoir is typically drawn down in Wyoming to just the river channel, limiting access in the state. There is one established boat ramp in Wyoming that is located to the west of the Highway 89 Bridge over the Snake River channel. Boater use on Palisades Reservoir typically occurs between late May and September, but the season can be cut short in Wyoming if the reservoir is drawn down significantly.

From statewide inspection data collected in 2018 and 2019, about 3.7% of boaters who were inspected and launching next on Palisades Reservoir required a High-Risk Inspection, and 0.5% of all boats needed decontamination. Resident (51%) and non-resident (49%) use is fairly equal, with Idaho (57%) and Utah (35%) making up the majority of non-resident use. Additionally, motorized boats account for 69% of boat use, which is divided between outboard (39%), inboard/outboard (32%), inboard (16%), personal watercraft (8%) and jet (5%) configurations.

The initial response by Wyoming to a dreissenid mussel detection in Palisades Reservoir would involve all Jackson Regional personnel (and personnel from other regions, if needed) staffing an AIS check station at the Alpine Boat Ramp, with the goal of minimizing the risk of spreading mussels to other waters. The check station will be open daily from 8 AM to 1 hour after sunset for up to six weeks while awaiting follow-up sampling results. Inspectors will contact every boater leaving Palisades Reservoir to conduct exit inspections, necessary decontaminations, and educate them about the issue and prevention methods.

After the initial response period by existing regional personnel, AIS crew leads and inspectors will be hired and tasked with operating the check station during Long-term Suspect, Positive or Infested status responses. The check station will be staffed with up to eight inspectors from May 15 through November 30. The check station will operate similar to the initial response effort, and boaters will be responsible to seek out exit inspections when check stations are closed.

Equipment and supply purchases and personnel costs for the initial year of a dreissenid mussel response for Suspect or Positive status are approximately $240,000. Equipment costs include the rental or purchase of decontamination units and vehicles, as well as the purchase of

an office and water hauling trailer. Additional costs of up to several hundred thousand dollars may also be needed to establish a new area for the check station and decontamination site to relieve congestion from inspection stations. These costs are included in the first year budget for Infested Status that is estimated to cost $492,00. After the first year, estimated annual operating costs for the check station will range from $112,000 to $215,000 (depending on status level) for personnel costs, supplies and equipment maintenance.

INTRODUCTION

Zebra (*Dreissena polymorpha)* and quagga (*Dreissena bugensis)* mussels are aquatic invasive species (AIS) that have far-reaching negative impacts on natural resources, water infrastructure, recreation, and can be attributed to significant economic loss. Zebra mussels are native to the Black and Caspian seas and were first discovered in the Great Lakes in 1988. Quagga mussels area native to the Dnieper River Drainage in Ukraine and were first found in the Great Lakes in 1989. Since their initial introductions, these species have spread across most of the United States, and have been detected in Wyoming's neighboring states of Nebraska, South Dakota, Montana, Colorado, and Utah. The close proximity of zebra and quagga mussels to Wyoming elevates the threat of introduction and increases the need for plans to contain them if detected.

Currently, Wyoming's AIS program is focused on outreach, watercraft inspection and monitoring, with the overall goal of keeping invasive species such as zebra and quagga mussels out of the state. Wyoming law requires inspection of all watercraft entering the state and the Wyoming Game and Fish Department (WGFD) currently maintains 14 inspection stations (primarily at Department of Transportation Ports of Entry) that intercept incoming watercraft and inspect them for the presence of AIS. The WGFD AIS program also conducts inspections at various waters by roving personnel and at regional offices. Annual monitoring for a variety of AIS, including zebra and quagga mussels, is conducted on priority waters throughout Wyoming and an outreach program is in place to educate the public about the threats of AIS and what they can do to prevent their spread.

If zebra or quagga mussels are detected in a Wyoming water, immediate action will be necessary to prevent their spread to other waters. This rapid response plan is a water-specific plan that outlines the steps needed to quickly mobilize personnel and equipment to provide exit inspections and, if necessary, decontaminations of all boats leaving the affected water. This plan will be initiated when zebra or quagga mussel veligers (larvae) or adults are detected in a sample from Palisades Reservoir and are verified by independent experts and genetic analysis. At that point, the lake will enter Short-term Suspect Status. This coincides with the period of time necessary to conduct additional sampling and testing necessary to verify whether zebra or quagga mussels are present (up to six weeks). If follow-up sampling does not detect zebra or quagga mussels, the water will enter Long-term Suspect Status and monthly monitoring will be initiated. If zebra or quagga mussels are not detected for three years, the water will once again be considered negative. Conversely, if two sampling events within a 12-month period detect zebra or quagga mussels, the water will enter Positive Status and will not be considered negative again unless mussels are not detected in monthly monitoring for five years. Finally, a water will enter Infested Status when evidence shows a recruiting and reproducing population of zebra or quagga mussels is established. At this point, eradication of mussels is highly unlikely and containment efforts will be necessary for the foreseeable future.

This plan provides guidance for the initial response to detection of dreissenid mussels at each of these four status levels and is intended to be implemented quickly and act as the guiding document for initial decision making following detection. It is not intended as a long-term containment plan, but will outline the action necessary to provide short-term containment while a long-term containment and monitoring plan is developed.

CONFIRMATION OF DREISSENID MUSSELS

Sampling of Wyoming waters is conducted annually in accordance with the "Wyoming Game and Fish Department Aquatic Invasive Species Sampling and Monitoring Manual" (WGFD 2019). High priority waters are sampled twice per season (June or July, and September or October), and lower priority waters are sampled once per season in September or October. To determine whether Wyoming waters contain evidence of AIS, specimens of adult or juvenile crayfish, snails, mollusks, plants, etc. are collected during routine sampling and any specimen suspected of being AIS must be positively identified by at least two independent experts. Only samples collected by the WGFD may be used to change the classification of a water. Samples collected by a third party will be used as a notification of a possible detection which must be confirmed by a WGFD sample.

To meet the minimum criteria for detection of dreissenid mussels, an adult or juvenile specimen must be verified by two independent experts and confirmed by DNA, or a veliger (larval form) must be identified and verified using cross-polarized light microscopy by two independent experts and confirmed by DNA analysis (PCR and gene sequencing).

Based on sampling results, waters are given certain classifications related to their dreissenid mussel status:

A water body that has not been sampled for aquatic invasive species is classified as *Unknown/Not Tested*. A water body at which sampling is ongoing and nothing has been detected (or nothing has been detected within the time frames for de-listing) is classified as *Negative*. Currently, all waters in Wyoming are classified as either *Unknown/Not Tested*, or *Negative*.

A water body classified as *Inconclusive* has not met the minimum criteria for detection but evidence of dreissenids has been documented. For example, evidence of a mussel veliger is detected via microscopy but cannot be confirmed by DNA analysis. This is a temporary classification and additional sampling of this water will be conducted to determine whether the water body is classified as negative (no detections in subsequent sample) or suspect (verified detection in subsequent sample).

A water body classified as *Suspect* indicates a water at which one sample has been verified by visual confirmation (visual identification of adult or microscopy identification of veliger) and this sample was confirmed as dreissenid by DNA analysis (PCR and gene sequencing). In this scenario, additional sampling will be conducted to determine whether another sample taken within 12 months detects evidence of dreissenids. If a subsequent sample does detect dreissenids, this water will then be classified as *Positive*.

A water body classified as *Positive* indicates a water at which two or more sampling events within a 12-month period meet the minimum criteria for detection. For example, samples from two different sampling events are verified by both visual identification (including microscopy) and DNA confirmation (PCR and gene sequencing).

In many cases, a water classified as *Positive* will ultimately become *Infested* which is a water body with an established (recruiting and reproducing) population of dreissenid mussels.

For example, lakes Mead and Powell are considered infested waters as they have large populations of reproducing dreissenids and mussels are readily evident on the shoreline and submerged materials such as docks, buoys, etc.

In some instances, the classification of a water body can be downgraded over time. The exact reasons why dreissenids are detected at a water once, then not again in subsequent sampling, or are detected in a water classified as *Positive* but never establish a population, remains largely unknown.

A water body initially classified as *Inconclusive* can be de-listed to *Negative* status after one year of negative testing results including at least one sample taken in the same month of subsequent year as the initial positive sample (to account for seasonal environment variability)**.** The time frame for de-listing a water body extends from there with a water body initially classified as *Suspect* requiring three years of negative testing to re-classify to *Negative*, a *Positive* water body requiring five years of negative testing to re-classify to *Negative*, and an *Infested* water body requiring a successful eradication or extirpation event and a minimum of five years of negative testing results post-eradication event to re-classify to *Negative*.

WATER DESCRIPTION

Palisades Reservoir is formed by Palisades Dam on the Snake River in Idaho, and impounds water from the Snake, Salt, and Greys rivers. Palisades Dam was completed in 1957 as the core of the United States Bureau of Reclamation's Palisades Project and provides irrigation water, flood control, and produces hydroelectric power from four turbines. Most of the produced power is used to pump water in the Minidoka Project, and the surplus is sold on the open market. At full pool, Palisades Reservoir has a storage capacity of 1.2 million acre-feet of water with a max depth near 270 feet. It is bordered by Idaho's Caribou Mountains to the west, the Snake River range to the north and east, and the Salt River range to the south and east.

In Wyoming, Palisades Reservoir bisects the town of Alpine, and at full pool, only 2.1% of the reservoir is in the state. There is about 6 miles of shoreline in Wyoming, with some shore launching access (Figure 1). Frequently it is drawn down to just the river channel, limiting access in Wyoming. Highways 89 and 26 provide access, and one established boat ramp is located to the west of the Highway 89 Bridge that spans the Snake River channel (Figure 1).

Boater use on Palisades Reservoir typically occurs between late June and September, but the season can be cut shorter in Wyoming if the reservoir is drawn down significantly in the late summer. There is also some fishing pressure early in the season after ice-off and before run-off has made the reservoir turbid and full of debris from the Snake River. From statewide inspection data collected in 2018 and 2019, about 3.7% of boaters who were inspected and launching next on Palisades Reservoir required a High-Risk Inspection, and 0.5% of all boats needed decontamination. Resident (51%) and non-resident (49%) use is fairly equal, with Idaho (57%) and Utah (35%) making up the majority of non-resident use. Additionally, motorized boats account for 69% of boat use, which is divided between outboard (27%), inboard/outboard (22%), inboard (11%), personal watercraft (6%) and jet (4%) configurations.

As stated above, nearly 98% of Palisades Reservoir is located in the state of Idaho. In Idaho there are five developed boat ramps, many shore launching locations, and several camping areas. Boating restrictions in Idaho will likely be different than those in Wyoming, and shore launching may be prohibited to minimize efforts needed by the state of Idaho.

Figure 1. Palisades Reservoir in Wyoming. Access roads for shore launching (when reservoir level allows) are depicted by pink markers, highways and major roads in yellow. Snake River is flowing into the reservoir from top right, Greys River from bottom right, and Salt River from bottom left. Existing port of entry AIS inspection station and boat ramp are labeled within map.

RAPID RESPONSE – SHORT-TERM SUSPECT STATUS

In the event that a sample from Palisades Reservoir is confirmed positive for dreissenid mussels, the reservoir will be considered Short-term Suspect (defined above). After the initial detection, follow-up sampling will occur and results will take approximately six weeks to be reported. During that time, it will be necessary to minimize the risk of spreading mussels to other waters. Within one week, resources will need to be in place to perform required clean, drain, dry exit inspections of all boats leaving the reservoir and decontamination of undrainable

areas, such as ballast tanks and motors. All watercraft leaving Palisades Reservoir will receive a red seal and seal receipt to verify the watercraft received an exit inspection. Red seals will designate use on a suspect, positive or infested water versus the brown seal currently used after a Wyoming AIS inspection.

At Short-term Suspect Status, there will not be time to hire personnel or purchase equipment. Therefore, the initial response will rely on existing personnel and equipment. Immediately after initial detection, job announcements and requisitions will be prepared so personnel can be hired and equipment can be purchased as quickly as possible once follow-up results are available.

Communication Plan

Upon the initial detection of dreissenid mussels, WGFD's AIS Coordinator will begin the administrative communication chain outlined in the WGFD AIS Administrative Rapid Response Plan (WGFD 2020). Initial contacts in the administrative communication chain include the AIS Coordinator contacting the Communications Director, the Regional Fisheries Supervisor, and the Fish Division Chief, who contacts the WGFD Director. On the regional level, the Regional Fisheries Supervisor will begin the regional communication chain to disseminate information about the detection to internal and external partners and stakeholders (Figure 2). Internal WGFD contacts include Regional Fish Division personnel, the Regional Wildlife Supervisor, the Regional Habitat and Access Supervisor and the Regional I&E Specialist. The Regional Wildlife Supervisor will then contact the Alpine and Afton game wardens as well as local Wildlife and Terrestrial Habitat biologists. The Regional Habitat and Access Supervisor will contact appropriate Habitat and Access biologists.

The Regional Fisheries Supervisor or biologists will also contact key stakeholders, including the U.S. Forest Service, U.S. Bureau of Reclamation, Idaho Fish and Game, and Idaho Department of Agriculture. They will also contact local business owners, Alpine Adventure Rentals, Pioneer Anglers, and Greys River Sports. Boater contacts made through the Wyoming AIS inspection stations will be used as a primary notification and education outlet during this time period. The AIS Coordinator will also contact and coordinate with WGFD communication personnel, including Regional I&E Specialists (see Public Outreach, below), and regional stakeholders (Western Regional Panel, federal partners, etc.).

Key information to convey to internal and external partners and stakeholders should include the name of the affected water, which species was collected, who collected the sample, where the sample was collected, which agency/expert analyzed the sample, any relevant information about the sample, who to contact for more information, a brief description of containment protocols that will be put in place, and any critical changes for the public. Every effort should be made to quickly contact all partners and stakeholders prior to beginning public outreach efforts. The regional fisheries supervisor will attempt to make all contacts within 24 hours of detection and will contact the Communications Director once enough contacts have been made to initiate outreach efforts.

Contact information for key individuals can be found in Appendix A.

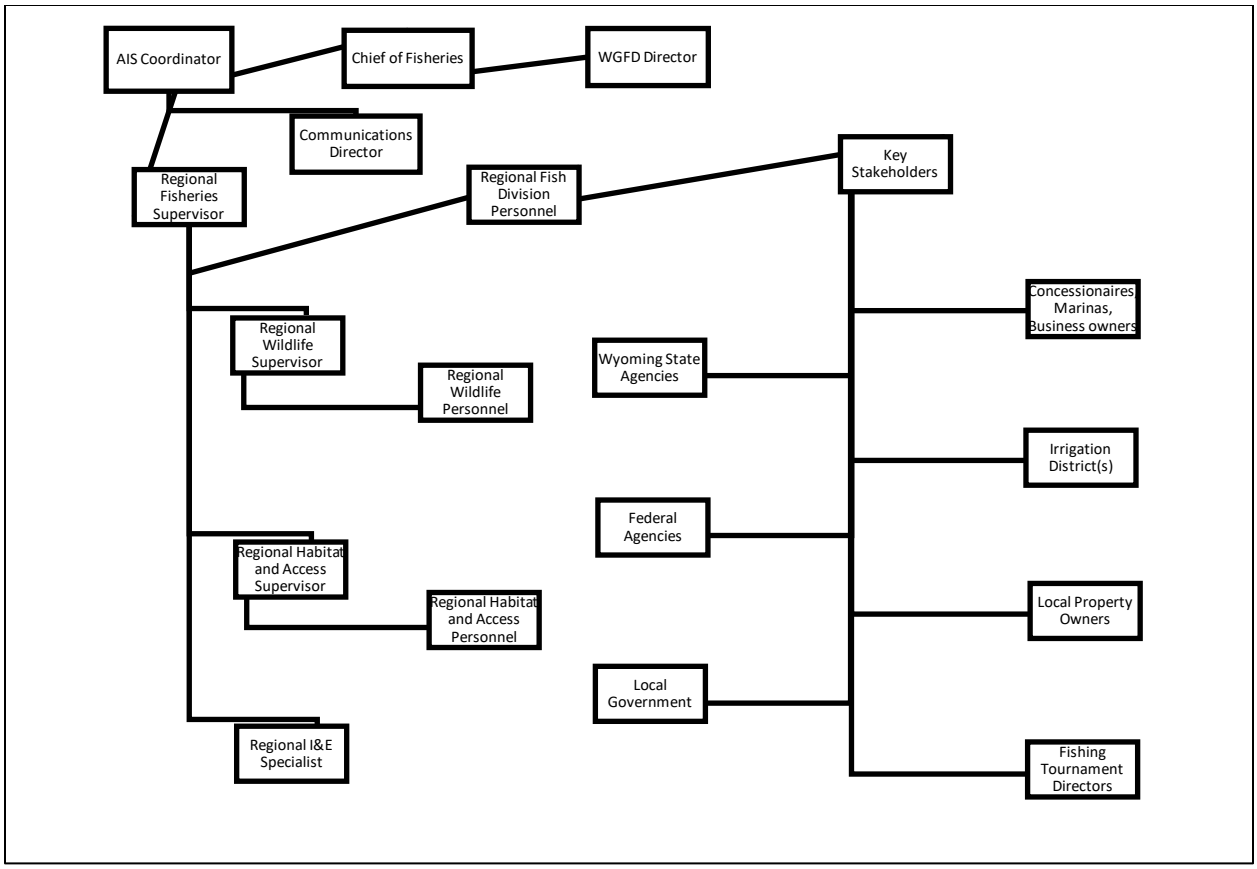

FIGURE 2. Communication chain for dissemination of information on the local and regional level following a dreissenid mussel detection in a Wyoming water.

The focus of this plan is on containing invasive mussels through inspection and decontamination of exiting watercraft. Consideration should be given to other potential vectors that could spread invasive mussels (e.g., aircraft used to combat wildfires, commercial water hauling equipment) and communication and coordination should occur with these entities to ensure containment. Current information on preventing the spread of aquatic invasive species in firefighting and water hauling equipment can be found on the WGFD website at https://wgfd.wyo.gov/Fishing-and-Boating/Aquatic-Invasive-Species-Prevention/AIS-Construction-and-Fire.

Closures

With the limited Wyoming access to Palisades Reservoir, no closures will be needed. Shore launching remains a risk, but access to launch from shore is limited to a few areas that are in close proximity to the Alpine Boat Ramp (Figure 1).

Check Station(s)

There will be no closures during the initial six-week period. However, watercraft leaving Palisades Reservoir (motorized and non-motorized) will be required to stop at a check station for

an exit inspection. AIS Inspectors will continue to offer inspections for entering conveyances, but priority will be given to mandatory inspections for watercraft exiting the reservoir and decontaminating undrainable areas such as ballast tanks.

Wyoming Game and Fish currently staffs a port of entry inspection station at the Alpine Port of Entry on US Highway 26, approximately one mile north of the Palisades Boat Ramp. An additional WGFD check station will be staffed at the Palisades Boat Ramp from 8 AM until 1 hour after sunset (Figure 1).

Staffing Plan

Staffing needs during the initial six week time period will be filled by Jackson regional WGFD personnel, roving AIS personnel, and the Alpine and Afton game wardens.

The greatest volume of boats departing Palisades Reservoir is typically from late morning to mid-afternoon (11:00 am to 4:00 pm). Staffing will be structured so the number of inspectors is maximized during that time period. Individual schedules will consist of four 10-hr days at a check station. During that time, inspectors may need to stay in Alpine to minimize travel time and cost. If the six week period falls during high use months (July, August, and September) staffing will consist of three different shifts, one person to open the check station (8:00 AM to 6:00 PM), one person to close the check station (12:00 PM to 10:00 PM) and one mid shift person (10:00 AM to 8:00 PM). The check station will be staffed with two inspectors during the slower months of the boating season, and shifts will consist of one person opening the check station (8:00 AM to 6:00 PM) and one person closing the check station (12:00 PM to 10:00 PM). To be fully staffed, the check station will require a total of six people during high use months or four people during lower use months.

To intercept boaters that are shore launching when reservoir levels allow, one inspector from the check station can quickly check the shore launching areas to determine the number of people that may not be using the boat ramp. If they find individuals that won't be using the boat ramp, they can talk to them directly to remind them to come to either the ramp or the Port of Entry check station for an exit inspection, or leave a reminder on their vehicle to help increase compliance.

Supplies and Equipment

Additional equipment and costs are outlined in Appendix B. Camp groceries are budgeted for personnel staying overnight. The Jackson Region currently has one extra decontamination unit available, but one additional unit will need to be rented or borrowed from another region. The US-26 check station has a water source, and is only 1.2 miles away. One ¾ ton truck and trailer with water tanks will be needed to transport water to the Alpine Boat Ramp check station. The truck and trailer will be borrowed from within the Jackson Region and two 500 gallon water tanks will be purchased, along with a 2-inch trash pump to transfer water from the water tanks to the decontamination units. Signs will be posted indicating Palisades Reservoir's status, the requirements for exit inspections, and boat ramp closures. These signs will be placed at all Wyoming access sites to the reservoir.

Public Outreach

The AIS Administrative Rapid Response Plan outlines the general public outreach plan for suspect, positive or infested determinations for Wyoming waters (WGFD 2020). Following an initial sample testing positive for dreissenid mussels, the AIS Coordinator will contact the Communication Director at WGFD Cheyenne Headquarters. Prior to initiating the public outreach plan, key partners and stakeholders should be contacted according to the Communication Plan (above). The regional fisheries supervisor will attempt to make all contacts within 24 hours of detection and will contact the Communications Director once enough contacts have been made. The Communications Director will then initiate the Communications Plan. A statewide press release will be sent out and information will be posted on the AIS website and any necessary social media. The AIS Coordinator, Regional Fisheries Supervisor and Regional AIS Specialist will collaborate with the Jackson Regional I&E Specialist to relay information about Short-term Suspect Status at Palisades Reservoir through media outlets (newspapers, radio, etc.). Regional Information and Education personnel will coordinate all communications efforts with the Communications Director.

Since shore launching can be common when reservoir levels allow, but is limited to several access points, a brief flier will be drafted to leave on vehicles found during the day at these sites. This flier will inform them of the reservoir's AIS status, and remind them where to go for the required exit inspection, with a simple map showing the check station locations.

RAPID RESPONSE – LONG-TERM SUSPECT STATUS

If initial follow-up sampling does not yield a positive result, Palisades Reservoir would enter Long-term Suspect Status (defined above) and remain at this level for up to three years if no additional positive samples are found. The goal during this period is still to minimize the risk of spreading mussels to other waters. During the first year (from initial detection through the following boating season), we will need to provide capacity for all boaters coming off the water to efficiently obtain a required clean, drain, dry exit inspection, motor flush, and decontamination of ballast tanks and other undrainable areas. All watercraft leaving Palisades Reservoir will receive a red seal and seal receipt to verify the watercraft received an exit inspection. Red seals will designate use on a suspect, positive or infested water versus the brown seal currently used after a Wyoming AIS inspection.

If there is no confirmation of dreissenid mussel presence after the first full boating season, efforts will switch in years two and three to a lower level response, with a goal of contacting a significant number of boaters, but placing more responsibility on boaters to obtain an exit inspection. Inspectors will still conduct clean, drain, dry exit inspections on boats leaving the water and decontaminate ballast tanks and other undrainable areas. If feasible, they will continue to flush all motors. If not, they will drain outboards motors and only flush inboard/outboard and inboard motors as these motor types are difficult to drain completely. Public outreach will increase via multiple outlets to highlight the potential threat at the suspect water.

Communication Plan

The administrative communication chain will continue to be utilized to inform all parties on follow-up sampling results and water status (see WGFD AIS Administrative Rapid Response

Plan; WGFD 2020). In addition, the regional internal communication chain outlined in the Short-term Suspect Status section (above) will continue to be utilized to inform the Region and key stakeholders (Appendix A) of follow-up sampling results.

Closures

With the limited Wyoming access to Palisades Reservoir, no closures will be needed. Shore launching remains a risk, but access to launch from shore is limited to a few areas that are in close proximity to the Alpine Boat Ramp (Figure 1).

Check Station

Motorized and non-motorized watercraft leaving Palisades Reservoir will be required to stop at a check station for an exit inspection. AIS Inspectors will continue to offer inspections for entering conveyances, but priority will be given to mandatory inspections of exiting watercraft.

Wyoming Game and Fish currently staffs an inspection station at the Alpine Port of Entry on US-26, approximately one mile north of the Palisades Boat Ramp. An additional WGFD check station will be staffed at the Palisades Ramp from 8 AM until 1 hour after sunset. The check station will be open and staffed from May 15 until November 30. There are limited shore launching areas, and an additional inspector will periodically check for people shore launching and advise them of the mandatory exit inspection requirement (Figure 1). During Years 2 and 3, this additional inspector will not be needed and the Alpine Boat Ramp Check Station will be open from 10 AM until 8 PM.

Staffing Plan

The check station will be staffed by one contract Biologist I and five technicians in Year 1, or three technicians in Years 2 and 3 (see budget table in Appendix B). In Year 1, there will be three inspectors present each day; one of which that will check shore launching sites, leaving at least two at the Alpine Boat Ramp at all times. The check station will be staffed from May 15 until November 30 (unless reservoir level becomes too low to use the ramp). Inspectors will work differing 10-hour shifts: one person to open the check station (8:00 AM to 6:00 PM), one person to close the check station (12:00 PM to 10:00 PM) and one mid-shift person (10:00 AM to 8:00 PM). In Years 2 and 3, the two inspectors will work the same 10-hour shift from 10:00 AM to 8:00 PM. Jackson regional personnel will fill in as needed.

Local Boater Program

Several states have had success implementing a “Local Boater Program” that allows individuals who only boat on the suspect, positive, or infested water to bypass or be expedited through check stations. A similar program will be pursued that would be implemented in Year 2 of Long-term Suspect Status.

A local boater program would allow agency personnel to maximize the allocation of available inspection and decontamination resources to high risk watercraft that are departing Palisades Reservoir. Local boater program participants will be identified by a decal that will require annual renewal. Further details on the local boater program and implementation can be found in the Administrative Rapid Response Plan (WGFD 2020).

Supplies and Equipment

Two decontamination units will be purchased so that there are two at the boat ramp. If both units break down, a backup is available at the US-26 Port of Entry check station (Appendix B). The US-26 check station has a water source, and is only 1.2 miles away. One ¾ ton truck and and a 10,000 lb capacity trailer will be purchased to transport water to the Alpine Boat Ramp check station. The water tanks and pump purchased during Short-term Suspect Status will be mounted on the new trailer. The truck will also be used to tow decontamination units when needed. One additional state motor pool sedan will be rented for inspector use. We will also purchase one office trailer, a pair of 2000 W generators with parallel kit, signage, and miscellaneous supplies (Appendix B). Since the inspection station is within the Town of Alpine, a camper trailer and camp groceries are not warranted. However, a limited amount of camp groceries was included for workers who travel to Alpine to assist with check station duties.

Public Outreach

At Long-term Suspect Status, statewide public outreach efforts will continue to follow the process outlined in the Administrative Rapid Response Plan (WGFD 2020). The Regional Fisheries Supervisor and Regional AIS Specialist will continue to collaborate with the Regional I&E Specialist to keep the local boating public aware of the threats and responsibilities associated with a Long-term Suspect Status on Palisades Reservoir.

RAPID RESPONSE – POSITIVE STATUS

Palisades Reservoir will be considered positive for dreissenid mussels if two or more sampling events within a 12-month period meet the minimum criteria for detection (defined above). Palisades Reservoir will remain at Positive Status for five consecutive years of negative sample results, at which time it will be downgraded to Negative Status. Alternatively, if an established population of mussels is detected during that five years, it will be upgraded to Infested Status.

The goal during Positive Status is still to minimize the risk of spreading mussels to other waters. We will need to provide capacity for all boaters coming off the water to efficiently obtain a required clean, drain, dry inspection, motor flush, and decontamination of ballast tanks and other undrainable areas. If live mussels are found on any boats during exit inspections, they will be fully decontaminated and consideration will be given to upgrading Palisades Reservoir's status to Infested. All watercraft leaving Palisades Reservoir will receive a seal and seal receipt to verify the watercraft received an exit inspection. Seals will be red in color to designate use on a suspect, positive or infested water versus the brown seal currently used after a Wyoming AIS inspection.

Communication Plan

The administrative communication chain will continue to be utilized to inform all parties on follow-up sampling results and water status (see WGFD AIS Administrative Rapid Response Plan; WGFD 2020). In addition, the regional internal communication chain outlined in the Short-term Suspect Status section (above) will be used to inform the Region and key stakeholders of changes in status level.

Closures

As outlined in Short-term Suspect and Long-term Suspect statuses, no closures will be needed. Shore launching remains a risk, but access to launch from shore is limited to a few areas that are in close proximity to the Alpine Boat Ramp (Figure 1).

Check Station

Check station details will follow guidelines already outlined in the Short-term and Long-term Suspect statuses. A check station will be staffed at the Palisades Boat Ramp from 8 AM until 1 hour after sunset. The check station will be open and staffed from May 15 until November 30. There are limited shore launching areas, and an additional inspector will periodically check for people shore launching and advise them on the mandatory exit inspection (Figure 1).

Staffing Plan

The staffing plan for checks stations will match that outlined in Year 1 of Long-term Suspect Status. One Biologist I will be hired to oversee operations and supervise five inspectors who will be hired for 7-month terms.

Local Boater Program

A Local Boater Program would be implemented during Year 2 of Long-term Suspect or Positive Status; whichever is reached first. Details can be found in the Long-term Suspect Status section and the Administrative Rapid Response Plan (WGFD 2020).

Supplies and Equipment

If Palisades Reservoir reached Positive Status without entering into Long-term Suspect Status, it will be necessary to purchase the equipment listed in the Long-term Suspect Status Year 1 budget. If these Items were already purchased during a Long-term Suspect Status, only one additional decontamination unit and miscellaneous supplies and materials will be necessary (Appendix B). The additional decontamination unit is included to replace failing or aging unit(s) during Long-term Suspect Status use.

Public Outreach

At Positive Status, statewide public outreach efforts will continue to follow the process outlined in the Administrative Rapid Response Plan (WGFD 2020). The Regional Fisheries Supervisor and Regional AIS Specialist will continue to collaborate with the Regional I&E Specialist to keep the local boating public aware of the threats and responsibilities associated with a Positive Status on Palisades Reservoir.

RAPID RESPONSE – INFESTED STATUS

Palisades Reservoir will be considered Infested if an established (recruiting or reproducing) population of dreissenid mussels is identified. Palisades Reservoir will remain at

Infested Status until methods for complete eradication are discovered and implemented. Based on the best available technology and science at the time of this publication, it is expected that Palisades Reservoir would remain in Infested Status in perpetuity.

The goal during Infested Status is still to minimize the risk of spreading mussels to other waters. We will need to provide the capacity to contact all boaters coming off the water, conduct exit inspections, and ensure all boats leaving have undergone a full decontamination. All watercraft leaving Palisades Reservoir will receive a red seal and seal receipt to verify the watercraft received an exit inspection. Red seals will designate use on a suspect, positive or infested water versus the brown seal currently used after a Wyoming AIS inspection.

Communication Plan

The administrative communication chain will continue to be utilized to inform all parties on follow-up sampling results and water status (see WGFD AIS Administrative Rapid Response Plan; WGFD 2020). In addition, the Regional internal communication chain outlined in the Short-term Suspect Status section (above) will continue to be utilized to inform the Region and key stakeholders of changes in status level.

Closures

As outlined in Short-term Suspect and Long-term Suspect statuses, no closures will be needed. Shore launching remains a risk, but access to launch from shore is limited to a few areas that are in close proximity to the Alpine Boat Ramp (Figure 1).

Check Station

Check station details will follow guidelines already outlined in the Short-term and Long-term Suspect statuses. A check station will be staffed at the Palisades Boat Ramp from 8 AM until 1 hour after sunset. The check station will be open and staffed from May 15 until November 30. There are limited shore launching areas, and an additional inspector will periodically check for people shore launching and advise them on the mandatory exit inspection (Figure 1).

Staffing Plan

The staffing plan for the check station will be very similar to that outlined in Year 1 of Long-term Suspect Status, with a modest increase in personnel to assist with the anticipated increased workload associated with decontamination of all watercraft, these two additional technicians will provide an extra person each day for the mid-shift. One Biologist I will be hired for a 12-month contract to oversee operations and supervise five 7-month term and two 4-month term technicians.

Local Boater Program

A Local Boater Program would be implemented during Year 2 of Long-term Suspect, Positive, or Infested Status; whichever is reached first. Details can be found in the Long-term Suspect Status section and the Administrative Rapid Response Plan (WGFD 2020).

Supplies and Equipment

If Palisades Reservoir reached Infested Status without entering into Long-term Suspect Status, it will be necessary to purchase the equipment listed in the Year 1 Long-term Suspect Status budget. If these items were already purchased during Long-term Suspect or Positive status, two additional decontamination units and miscellaneous supplies and materials will be necessary (Appendix B). The additional decontamination units are included to replace failing or aging units during the Long-term Suspect or Positive status use, and to keep two operational for decontaminations while having one spare. Periodically, decontamination units will need to be replaced during Infested Status.

If Palisades Reservoir reaches Infested Status, there will be a low probability of being downgraded in status, and the check stations will become permanent; requiring additional investment in infrastructure. The Alpine Boat Ramp parking lot area will likely need to be enlarged to decrease congestion and space limitations that likely occurred during the other statuses. Additional changes to the check station will include a permanent power source, gravel and a poured concrete decontamination pad, and a water well (Figure 2). The costs associated with all of these amenities are included in Appendix B.

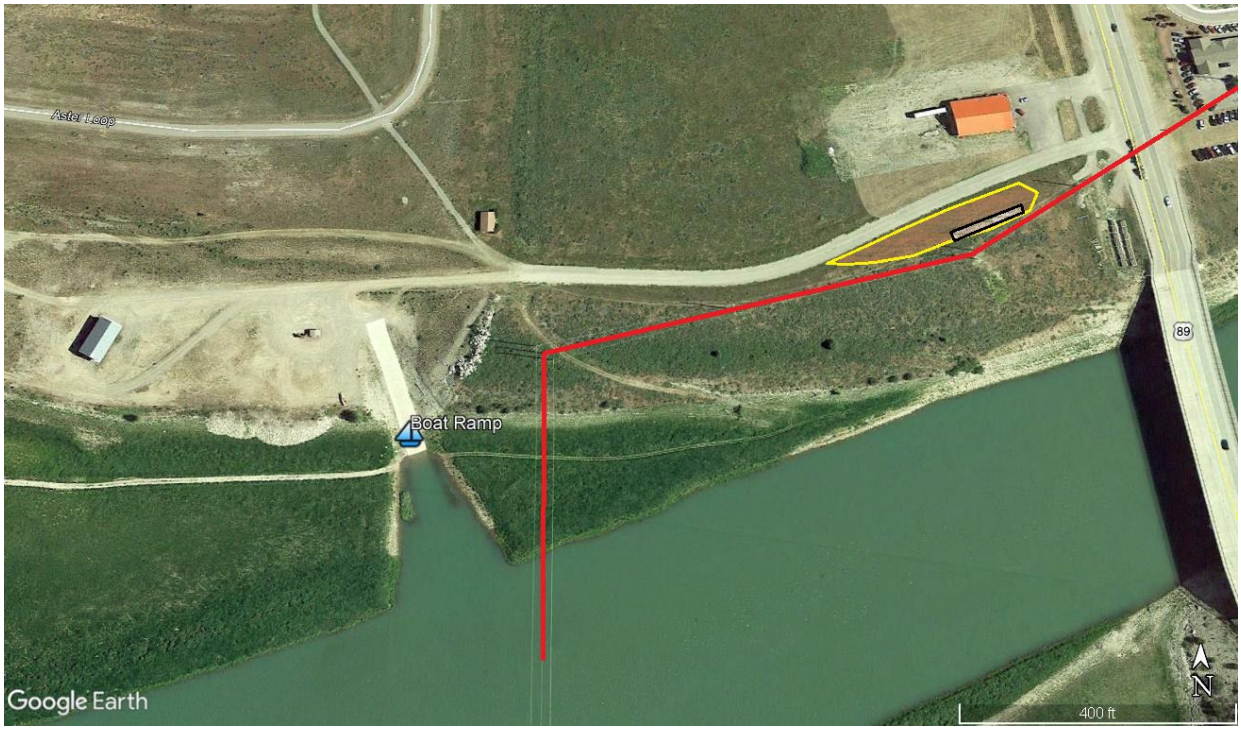

Figure 2. Proposed new location of inspection and decontamination location if Infested Status is reached. Existing power line is depicted in red, graveled area depicted by yellow polygon and asphalt or concrete decontamination pad depicted by black rectangle. Not depicted is graveled downhill drain from decontamination pad.

Public Outreach

At Infested Status, statewide public outreach efforts will continue to follow the process outlined in the Administrative Rapid Response Plan (WGFD 2020). The Regional Fisheries

Supervisor and Regional AIS Specialist will continue to collaborate with the Regional I&E Specialist to keep the local boating public aware of the threats and responsibilities associated with a Long-term Suspect Status on Palisades Reservoir.

REFERENCES

WGFD. 2019. Wyoming Game and Fish Department Aquatic Invasive Species Sampling and Monitoring Manual. Wyoming Game and Fish Department, Cheyenne, WY.

WGFD. 2020. Wyoming Game and Fish Department Administrative Dreissenid Mussel Rapid Response Plan. Wyoming Game and Fish Department, Cheyenne, WY.

APPENDIX A: KEY CONTACTS

		Phone	Email
Wyoming Game & Fish Department			
Josh Leonard	Aquatic Invasive Species Coord.	307-721-1374	joshua.leonard@wyo.gov
Rob Gipson	Jackson Region Fisheries Supervisor	307-733-2321	rob.gipson@wyo.gov
Brad Hovinga	Jackson Region Wildlife Supervisor	307-733-2321	dan.smith@wyo.gov
Chris Wight	Jackson Region AIS Specialist	307-733-2321	chris.wight@wyo.gov
Clark Johnson	Jackson Region Fisheries Biologist	307-733-2321	clark.johnson@wyo.gov
Diana Miller	Jackson Region Fisheries Biologist	307-733-2321	diana.miller@wyo.gov
James Hobbs	Afton Game Warden	307-885-3717	james.hobbs@wyo.gov
Vacant	Alpine Game Warden	307-654-7743	
Mark Gocke	Information & Education Specialist	307-733-2321	mark.gocke@wyo.gov
Idaho Fish and Game			
Brett High	Upper Snake Region Fisheries Manager	208-525-7290	brett.high@idfg.idaho.gov
Idaho State Department of Agriculture			
Nic Zurfluh	Section Manager- Invasive Species Coordination and Outreach	208-332-8686	nicholas.zurfluh@isda.idaho.gov
Cole Morrison	Program Specialist – Invasive Species	208-525-7206	cole.morrison@isda.idaho.gov
U.S. Bureau of Reclamation			
Melanie (Lanie) Paquin	Snake River Area Manager	208-383-2246	mpaquin@usbr.gov
United States Forest Service			
Tracy Hollingshead	Palisades District Ranger	208-523-1412	tracy.hollingshead@usda.gov
Concessionaires			
Alpine Adventure Rentals	Dave Walters	307-654-5678	dave@jhadventure.com
Stakeholders			
Town of Alpine		307-654-7757	town@alpinewy.org
Snake River Fund	Jared Baecker	307-734-6773	jared@snakeriverfund.org
Pioneer Anglers LLC	Christy Carlson	307-654-3330	christy@pioneeranglers.com
Greys River Sports		307-654-3474	info@johnnystackle.com

APPENDIX B: ANNUAL BUDGETS ASSOCIATED WITH EACH STATUS LEVEL

SHORT-TERM SUSPECT STATUS

Travel	Description	# of Days	Cost/Day	Total Cost
	Camp Groceries (person days)	126	$24	$3,024
	Subtotal			**$3,024**
Supplies	**Description**	**# of units**	**Cost/unit**	**Total Cost**
	550 gal plastic ag tank	2	$450	$900
	2-inch trash pump	1	$300	$300
	Decon Unit Rental	1	$8,400	$8,400
	Check station signs	4	$600	$2,400
	Subtotal			**$12,000**
	Total			**$15,024**

LONG-TERM SUSPECT STATUS YEAR 1

Personnel	Description	# of Months	Cost/Month	Total Cost
	Biologist I, 8 months	8	$4,543	$36,344
	Technician 1, 7 months	7	$2,863	$20,041
	Technician 2, 7 months	7	$2,863	$20,041
	Technician 3, 7 months	7	$2,863	$20,041
	Technician 4, 7 months	7	$2,863	$20,041
	Technician 5, 7 months	7	$2,863	$20,041
	Outside help for busy times	1	$4,553	$4,553
	Subtotal			**$141,102**
Vehicle	**Description**	**# of Months**	**Cost/Month**	**Total Cost**
	State Motor Pool Sedan	8	$500	$4,000
	Purchase 3/4 ton pickup	1	$33,000	$33,000
	Subtotal			**$37,000**
Travel	**Description**	**# of Days**	**Cost/Day**	**Total Cost**
	Per Diem for outside help	30	$157	$4,710
	Subtotal			**$4,710**
Supplies	**Description**	**# of Units**	**Cost/Unit**	**Total Cost**
	16-foot utility trailer, 10,000lb rating	1	$4,000	$4,000
	Office Trailer	1	$20,000	$20,000
	Generator 2-pack with parallel	1	$1,900	$1,900
	Decon Unit with attachments	2	$12,500	$25,000
	Misc supplies 231 - 239 series	1	$5,000	$5,000
	Check Station signs	6	$650	$3,900
	Subtotal			**$59,800**
	Total			**$242,612**

LONG TERM SUSPECT STATUS YEARS 2-3

Personnel	Description	# of Months	Cost/Month	Total Cost
	Biologist I, 8 months	8	$4,543	$36,344
	Technician 1, 7 months	7	$2,863	$20,041
	Technician 2, 7 months	7	$2,863	$20,041
	Technician 3, 7 months	7	$2,863	$20,041
	Outside help for busy times	1	$4,553	$4,553
	Subtotal			**$101,020**
Vehicle	**Description**	**# of Months**	**Cost/Month**	**Total Cost**
	State Motor Pool Sedan 1	8	$500	$4,000
	Subtotal			**$4,000**
Travel	**Description**	**# of Days**	**Cost/Day**	**Total Cost**
	Per Diem	30	$157	$4,710
	Subtotal			**$4,710**
Supplies	**Description**	**# of units**	**Cost/unit**	**Total Cost**
	misc supplies 231-239	1	$2,500	$2,500
	Subtotal			**$2,500**
	TOTAL			**$112,230**

POSITIVE STATUS

Personnel	Description	# of Months	Cost/Month	Total Cost
	Biologist I, 8 months	8	$4,543	$36,344
	Technician 1, 7 months	7	$2,863	$20,041
	Technician 2, 7 months	7	$2,863	$20,041
	Technician 3, 7 months	7	$2,863	$20,041
	Technician 4, 7 months	7	$2,863	$20,041
	Technician 5, 7 months	7	$2,863	$20,041
	Outside help for busy times	1	$4,553	$4,553
	Subtotal			**$141,102**
Vehicle	**Description**	**# of Months**	**Cost/Month**	**Total Cost**
	State Motor Pool Sedan 1	8	$500	$4,000
	Purchase 3/4 ton pickup[a]	1	$33,000	$33,000
	Subtotal			**$37,000**
Travel	**Description**	**# of Days**	**Cost/Day**	**Total Cost**
	Per Diem for outside help	30	$157	$4,710
	Subtotal			**$4,710**
Supplies	**Description**	**# of Units**	**Cost/Unit**	**Total Cost**
	16-foot utility trailer, 10,000lb rating[a]	1	$4,000	$4,000
	Office Trailer[a]	1	$20,000	$20,000
	Generator 2-pack with parallel[a]	1	$1,900	$1,900
	Decon unit with attachments[a]	2	$12,500	$25,000
	Misc supplies 231 - 239 series	1	$5,000	$5,000
	Check Station signs[a]	6	$650	$3,900
	Subtotal			**$59,800**
	Total			**$242,612**

[a] These items will not need to be purchased if transitioning from Long-term Suspect Status.

INFESTED STATUS

Personnel	Description	# of Months	Cost/Month	Total Cost
	Biologist I, 12 months	12	$4,543	$54,516
	Technician, 7 months x 5	35	$2,863	$100,205
	Technician, 5 months x 2	10	$2,863	$28,630
	Outside help for busy times	2	$4,553	$9,106
	Subtotal			**$192,457**
Vehicle	**Description**	**# of Months**	**Cost/Month**	**Total Cost**
	State Motor Pool Sedan 1	7	$500	$3,500
	State Motor Pool Sedan 2	7	$500	$3,500
	Purchase 3/4 ton pickup[a]	1	$33,000	$33,000
	Subtotal			**$40,000**
Travel	**Description**	**# of Days**	**Cost/Day**	**Total Cost**
	Per Diem for outside help	60	$157	$9,420
	Subtotal			**$9,420**
Supplies	**Description**	**# of Units**	**Cost/Unit**	**Total Cost**
	Gravel for pullout & decon area drain	4	$15,000	$60,000
	Concrete for decon area	1	68,000	$68,000
	Office Trailer[a]	1	$20,000	$20,000
	Decon Unit with attachments[b]	3	$12,500	$37,500
	Misc supplies 231 - 239 series	1	$5,000	$5,000
	Check Station signs[a]	6	$650	$3,900
	Water Well	1	$50,000	$50,000
	Subtotal			**$244,400**
Utilities	**Description**	**# of Units**	**Cost/Unit**	**Total Cost**
	Power Hookup	1	$4,000	$4,000
	Monthly power cost	7	$200	$1,400
	Subtotal			**$5,400**
	Total			**$491,677**

[a] Will not need to be purchased if transitioning from Suspect or Positive status.
[b] Only two units will need to be purchased if transitioning from Suspect or Positive status.