Idaho Invasive Species Watercraft Inspection Program 5 Year Review 2009-2013

01/15/2014

Executive Summary

In 2009, the Idaho Legislature and Governor provided the statute and authority to the Idaho State Department of Agriculture to institute an ambitious and proactive watercraft inspection program in order to prevent the introduction of zebra and quagga mussels into the state. Zebra and quagga mussels cause significant economic and environmental damage and are primarily transported and introduced through the movement of watercraft. To date, the program has conducted nearly 200,000 inspections and has intercepted 105 vessels transporting mussels. Awareness of the boating public to the issue of aquatic invasive species has been greatly improved since the implementation of the inspection program, and many boaters are now going out of their way to ensure they are practicing "Clean, Drain and Dry" on their boats and equipment. Idaho has completed five seasons of watercraft inspection, and the neighboring states of Oregon, Montana, and Wyoming currently operate stations following Idaho's model of mandatory roadside inspection.

Data is collected from each watercraft inspected to help determine the risk a vessel may pose for the transport of aquatic invasive species. Data is also used to improve the efficacy and efficiency of the program to better target vessels that may be transporting mussels. Review of data collected from five years of Idaho's Watercraft Inspection Program identifies three primary source locations for watercraft that are transporting live mussels into Idaho: Lake Mead, Lake Havasu, and Lake Pleasant. These water bodies are three discrete sources of mussel fouled vessels that have been intercepted by Idaho's Inspection Program. Vessels that visit these areas are a direct threat to the waters of Idaho and the Northwest, and it is imperative that these boats are cleaned, drained and dried before they enter the region. The level of boater use on these water bodies is significant. Inspection data collected from boaters that report recent visits (in the previous 30 days) to water bodies with known mussel populations indicates that 95% of those visits were to water bodies in the southwestern United States.

The discovery of adult quagga mussels in Lake Powell in 2013 significantly raises the threat of quagga mussel movement into Idaho. Of the mussel fouled water bodies that were visited in the previous 30 days, Lake Powell represents over 50% of those visits. This makes Lake Powell the most frequently visited mussel fouled water body and presents a significant source for vessels that may be transporting mussels into Idaho. This finding emphasizes the urgency for a containment program at Lake Powell and the Glen Canyon National Recreation Area.

Idaho is not only a destination for watercraft, but is also a conduit to other states and provinces. A significant number of high-risk and mussel-fouled watercraft that are inspected at Idaho stations are destined for somewhere other than Idaho. When a mussel-fouled watercraft is intercepted, all available information for that watercraft is provided to the destination state or province. This allows for the destination state or province to follow up with the boat owner and to conduct their own inspection to ensure the watercraft is no longer transporting invasive species.

The risk of vessels transporting mussels and other invasive species into Idaho remains a serious threat to lakes, rivers and water-based infrastructure of the region. Idaho continues to work with neighboring states to coordinate and improve watercraft inspection and invasive species prevention. Idaho is also

actively working with other state and federal agencies in the areas where mussels exist to help improve notification and prevention of vessels leaving mussel infested waters.

Background

The Idaho Invasive Species Law (Title 22 Chapter 19, Idaho Code) was enacted by the Legislature in 2008. The intent of this law was to address the increasing threat of invasive species to the State of Idaho by providing policy direction, planning, and authority to combat invasive species and prevent the introduction of new species. This law established specific duties of the Idaho State Department of Agriculture (ISDA) and its Director, authorized the ISDA's Director to promulgate rules, established the Idaho Invasive Species Fund (IISF), and provided the authority to conduct inspections as necessary.

In 2010, the Idaho Protection Against Invasive Species Sticker Rules (IDAPA 26.01.34) were promulgated by the Idaho Department of Parks and Recreation (IDPR) under authorization provided in the Invasive Species Act. The sticker provided a funding source for the Invasive Species Program. The Rule required Idaho registered motorized, non-resident motorized, and both resident and non-resident non-motorized boats to purchase an IISF sticker to launch in waters within the state of Idaho. IDPR was designated to administer the sticker program and the revenue generated by this program was to be deposited in the Idaho Invasive Species Fund (IISF). The IISF was provided for in the Invasive Species Act and ISDA was designated to administer the fund for invasive species program expenses, including prevention, education and early detection/rapid response (EDRR).

In 2009, the Rules Governing Invasive Species (IDAPA 02.06.09) were promulgated by the ISDA. The Rules included an emergency clause that required immediate implementation in order to rapidly address the threat of quagga mussel expansion in the western states and to protect the waters of Idaho. Following the signature of Governor C.L. 'Butch' Otter in May of that year, by July, a Watercraft Inspection Program was developed and implemented, in order to inspect watercraft for the 2009 boating season.

With statutory authority and rules in place, the development of the program began. The program was organized and implemented within the Noxious Weeds Section, Plant Industries Division of ISDA. Existing agency staff and management, in consultation with the Idaho Invasive Species Council (IISC), identified primary program objectives and activities. The initial program activities and infrastructure included:

- Watercraft Inspection Program standards and protocols
- Watercraft inspection training manual for agency employees and contractors
- Identification of inspection locations and operation parameters
- Data collection and management for inspection data
- Outreach to the public regarding the new requirements for watercraft inspection and the Clean, Drain, Dry concept

ISDA consulted with a number of resources (IISC, Colorado, California, 100th Meridian Initiative) about how best to develop a statewide prevention program. Few state or federal agencies had previous experience with operating watercraft inspection stations; therefore, many details of how to operate such a program were unknown. Some of these unknown details included:

- The movement of watercraft in and out of the state of Idaho, (where were vessels coming from and where were they going).
- The volume of boat traffic that passes through any specific location.
- The major source of mussel-fouled vessels that travel through the state.
- The time of year that mussel-fouled vessels travel through the state.
- The prevalence of mussel-fouled watercrafts that enter the state of Idaho.
- The number of watercraft that might require "hot washes" or "decontamination", and the necessary capacity of on-site equipment to accommodate these watercraft.

Where possible, the program tried to utilize previously produced standards and outreach materials. Contributing programs included:

- The state of Colorado's watercraft inspection training manual served as a template for the Idaho Watercraft Inspection Manual.
- California's agricultural inspection stations were the only stations conducting roadside watercraft inspection at that time. The data collected at these stations was utilized as a baseline for the data collection program in Idaho.
- Materials developed by the 100th Meridian Initiative and its members were used, and continue to be utilized, in Idaho for outreach materials.
- The Idaho Transportation Department (ITD) assisted with the identification of station locations, signage, and safe operating parameters.
- ITD also requested (and received) watercraft inspection training for Port of Entry staff in order to assist in identifying fouled commercial watercraft entering the state.
- IDPR allowed for the use of certain state parks for the operation of inspection stations.

Initial planning and program development identified data collection and data management as an essential part of the program, mostly due to the lack of existing data. Data collection has evolved from paper inspection forms entered by hand into a computer database, to a real-time electronic system in which data is entered on-site during an inspection and is available instantly to program staff state-wide. Data based decisions are essential and data collected include:

- Watercraft movement: Points of origin and destination, mussel infested water bodies visited, recent water bodies visited, the timing of such movement, and the home state of the boater.
- Commercially transported vessels: Haulers and their destinations for oversize load permitted vessels moving in Idaho. Information provided to ISDA by ITD.
- Invasive Species Monitoring: Data collected from multi-taxa survey and sampling at locations state-wide.

Roadside stations began operation in July 2009 and operated through August of that year. A variety of other interested partners also began conducting watercraft inspections at this time, including counties, lake associations, and the U.S. Forest Service. These partners initiated inspections at boat ramps to prevent the spread of Eurasian watermilfoil, but quickly broadened their focus to look for mussels and other aquatic invasive species (AIS) as well. A total of 21 inspection stations were in operation during the 2009 season, including 17 highway inspection locations.

During the first year of operation, Idaho's program inspected 20,711 vessels, 3 of which were found with zebra or quagga mussels. The first season of operation provided the ground work for the development of Idaho's Watercraft Inspection Program, and the program continues to innovate and adapt in order to protect the waters of Idaho from AIS. This is accomplished through watercraft inspection, survey, and public education that reinforces the clean, drain, dry message.

Watercraft Inspection Progression

Changes have been made in subsequent years of the Watercraft Inspection Program in order to improve the efficiency and efficacy of operation. Following the rapid deployment of watercraft inspectors through a private contractor in 2009, partnerships were built with local entities such as soil and water conservation districts and county governments. Today, all of the stations in the state are operated by these regional partners or ISDA staff.

ISDA provides all funding and training for stations, while contracts with partner agencies define responsibilities to their respective stations for day-to-day operation. Partnering with these local agencies has led to increased involvement and support for the program state-wide. Partners such as the Bruneau Soil and Water Conservation District have built local support to a point where an Owyhee County Sheriff's Deputy or Posse member is staffed at the station during all shifts. This has resulted in excellent compliance for inspections and has been outstanding for public outreach.

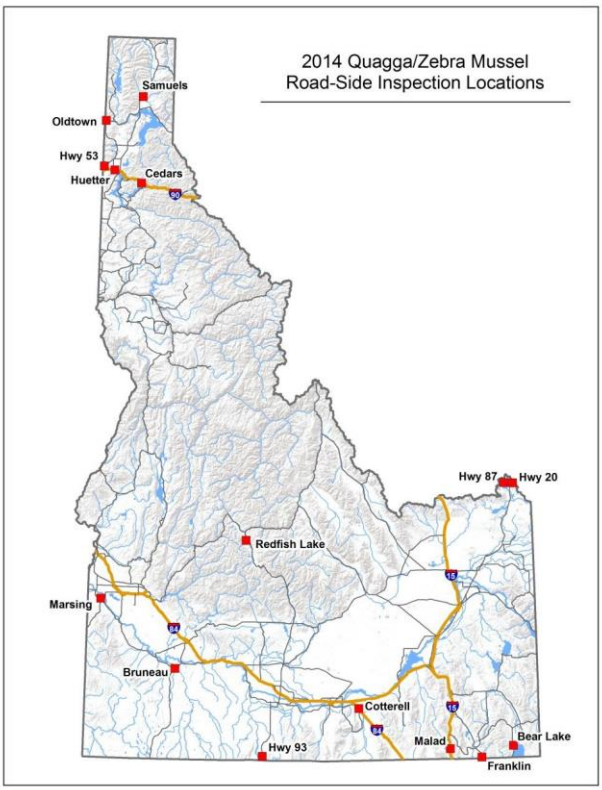

Figure 1: Idaho Watercraft Inspection Station locations planned for 2014

Other changes to station function have been driven by the very data the stations collect. Data is one of the primary tools used to identify areas for improvement and to better target the invasive species transport risk. Some inspection stations have been relocated, while others were eliminated entirely due to data indicating a lack of high risk vessels or because of redundant inspections. The length of the inspection season has also been expanded in order to address early season boater traffic returning to Idaho from the lower Colorado River system and other high-risk water bodies. Today, some stations operate from February through September due to the number of high risk vessels traveling through those areas, while other stations operate only during the summer boating season (Figure 1).

The number of watercraft inspected averages around 43,000 inspections per year, utilizing 15 stations (Figure 2). During the peak of the inspection season, nearly 1,000 watercraft are inspected per day. To date, Idaho has inspected almost 200,000 vessels the past 5 seasons. Each inspection helps identify and prevent the introduction of AIS, and is also an opportunity to educate boaters on what they can do to help protect the waters they enjoy, both for their own recreation as well as for the state's livelihood.

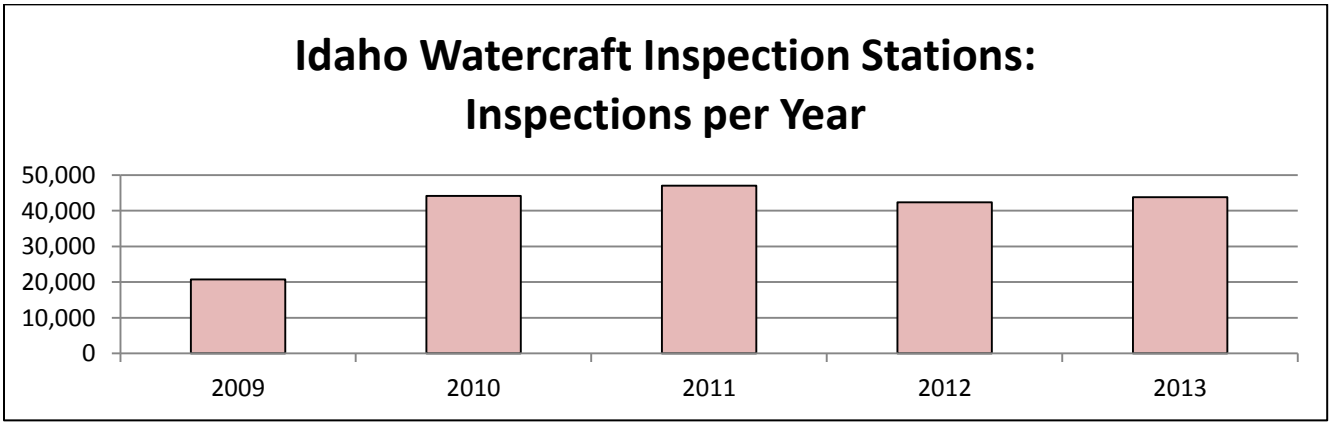

Figure 2: Number of watercraft inspected in Idaho by year, 2009 to 2013. 197,990 total inspections

In 2011, ISDA began electronic data collection using hand-held data units. Data units were used to help expedite data entry and processing, reduce data entry errors, and lower costs. Data is entered at each station on hand-held tablet devices using a survey template form with drop-down menus. This provides a consistent and searchable data stream, allowing for rapid identification of issues at stations and real time monitoring of high risk boat traffic. In 2013, new data tablets with wireless capabilities allowed for even easier and direct data submission from stations, which provided the means to download data instantly.

Also in 2011, the Idaho Invasive Species Passport was introduced to help expedite inspections for boaters who were inspected multiple times during a season. If the boater chooses, they can be issued a passport following an initial inspection. The passport is then stamped with the station name and date, which serves as a proof of inspection for the next time the boat is inspected. Each passport is individually numbered and that number is linked to the information provided during the initial inspection. When the boater returns to an Idaho inspection station, the Passport number is recorded and less information needs to be collected. The boat still receives an inspection, but the process is expedited because there is a record of previous inspections. The Passport also contains invasive species educational information and can be used multiple years (Figure3).

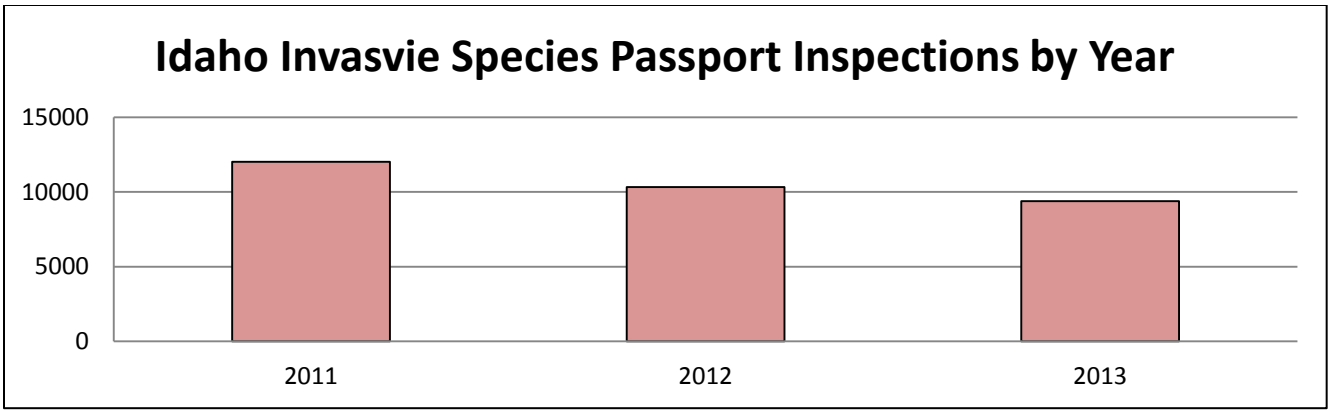

Figure 3: Idaho Invasive Species Passport watercraft inspections, 2011 to 2013. 31,720 total Passport inspections.

Data collected at the stations illustrates the large volume of boats that come into and through the state. The distribution and frequency of zip codes collected from inspected boats shows that boaters visit Idaho from all over the United States and Canada (Figure 4).

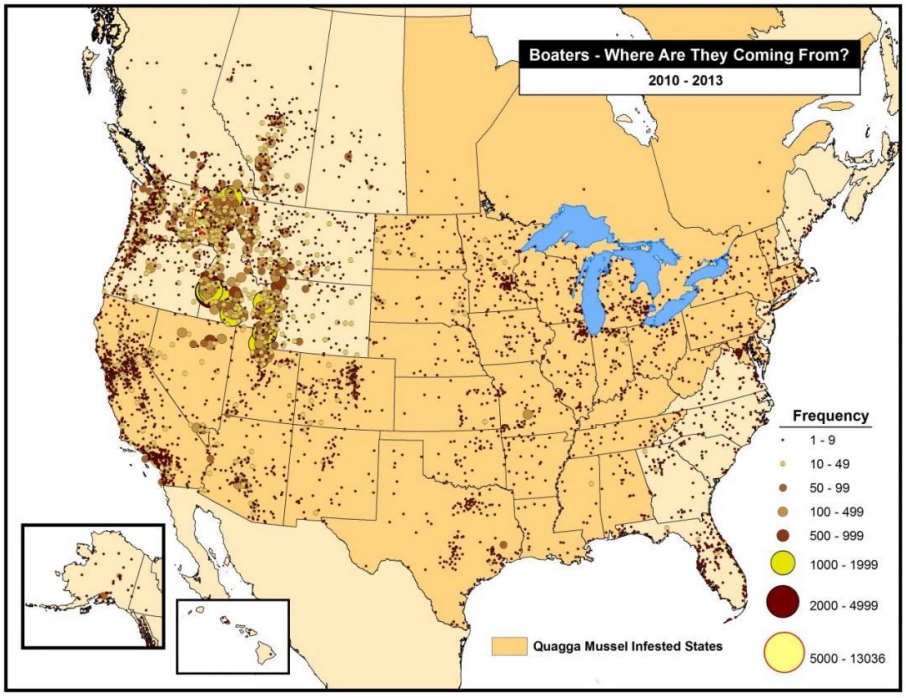

Figure 4: Boater home zip code location and frequency. Watercraft inspected at Idaho stations, 2010 - 2013 combined data.

Following inspection at the stations, vessels proceed to locations in Idaho and often travel through Idaho to locations throughout the United States and Canada (Figure 5).

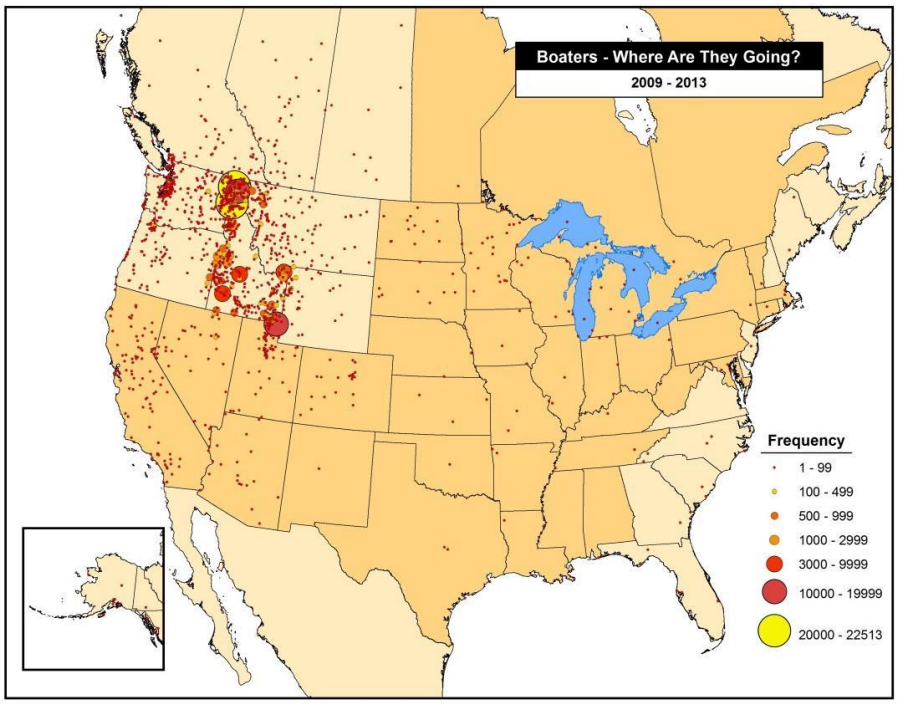

Figure 5: Boater destination and frequency. Watercraft inspected at Idaho stations, 2009 to 2013 combined data.

Determination of Risk

The primary objective of the Idaho watercraft inspection program is to prevent the introduction of AIS into Idaho. A wide variety of AIS exist in North America including invasive plants, snails, mussels, clams, crayfish, frogs, and fish. Of these species, zebra and quagga mussels present the most significant threat to the economy and aquatic ecosystems in the region. The introduction of these species is preventable because their primary means of transport between basins is by humans on watercraft and equipment.

An adult mussel can survive up to 30 days out of the water. Mussel larvae (veligers) are microscopic, free floating, and can survive even longer in live wells, bilge water, or ballast water. Boats are the primary vector for transporting these species and the Watercraft Inspection Program's main objective is to ensure vessels are not transporting invasive mussels. The proximity of existing mussel populations in the Lower Colorado River area and, to a lesser extent, the Great Lakes area, provides a great deal of boater traffic traveling to and through Idaho from these locations.

The risk of a vessel transporting live mussels depends on the type of vessel, how long it has been in the water, how long it has been out of the water at time of inspection, and where it is coming from. A vessel's risk in transporting mussels is outlined below:

Critical Risk: Moored vessels from mussel infested waters. Vessels that are moored for extended periods of time in waters where zebra or quagga mussels are present provide critical risk. These vessels have the highest likelihood of transporting a large number of live mussels into Idaho or the region. This critical category includes three types of vessels:

- Large complex vessels: Vessels that rarely leave the water and have the highest risk of transporting mussels. Due to the size of this type of vessel, commercial haulers typically transport them. (*These vessels are required to have oversize load permits and the ITD assists with the identification and inspection of these vessels*).
- Privately transported: These vessels are not usually as large and complex but still pose a significant risk for transporting mussels. They include watercraft that remain in the water at dock or marina facilities, or are able to transport water (such as wake boats with ballast tanks).
- Equipment: Floating or submerged equipment including barges, buoys, pipes, pumps, docks, pontoons and boat lifts. Equipment of this kind is submerged for extended periods of time and has a high likelihood of transporting large numbers of mussels. (*Used dock platforms and boat lifts are permitted by Idaho Department of Lands and require inspection before installation*).

High Risk: Day Use Vessels in Mussel-Infested Waters: Vessels that have been in mussel-infested waters but are not stored in the water. These boats can transport live adult mussels; however, the more likely risk is the transport of standing water with microscopic veligers.

Moderate Risk: Vessels that have been in waters where mussels are not known to exist. The possibility exists that mussels can be present but undetected in any water body. For this reason, along with the threat of other AIS, all watercraft owners must practice clean, drain, dry.

The watercraft inspector determines the level of risk presented by the vessel when information is collected from the boater. If the vessel is determined to be a "Critical" or "High Risk" vessel, a more thorough inspection is conducted. If a mussel is found, the inspection is halted and the inspector calls ISDA for assistance. Vessels transporting mussels that are suspected to be alive will be impounded, decontaminated, and held to dry for up to 30 days to ensure that any unseen mussels are no longer alive. If no mussels are found on a high risk vessel, the inspector conducts a precautionary hot wash to destroy any unseen invasive organisms and to ensure that the vessel is safe to launch into Idaho waters. Hot water washes are also conducted on vessels that are found with aquatic plants, vessels that are generally dirty, or if the origin of the vessel is unknown. Hot water wash units are located at each station to allow easy access for washing.

Zebra / Quagga Mussel Fouled Vessels

A total of 105 vessels have been intercepted with zebra or quagga mussels since the beginning of the Watercraft Inspection Program in 2009. Of those, 40% originated from the Great Lakes and the Eastern United States, 36% from Lake Mead, 15% from Lake Havasu, and 5% from Lake Pleasant (Figure 6).

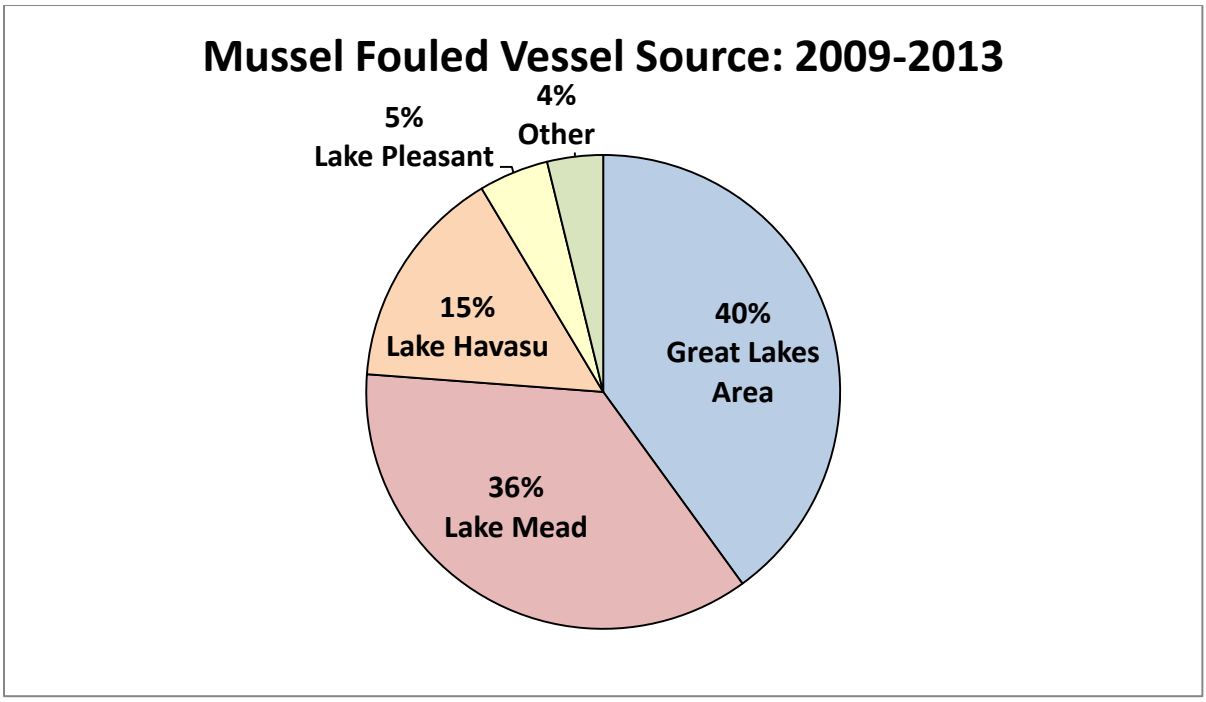

Figure 6: The source of vessels intercepted with zebra or quagga mussels by Idaho's watercraft Inspection Program. Combined data from 2009 - 2013. Total of 105 fouled vessels.

The destination of the mussel fouled vessels that were intercepted by Idaho's program includes 27% destined for Idaho, 41% for Washington, 19% for Canada and 10% for Oregon (Figure 7).

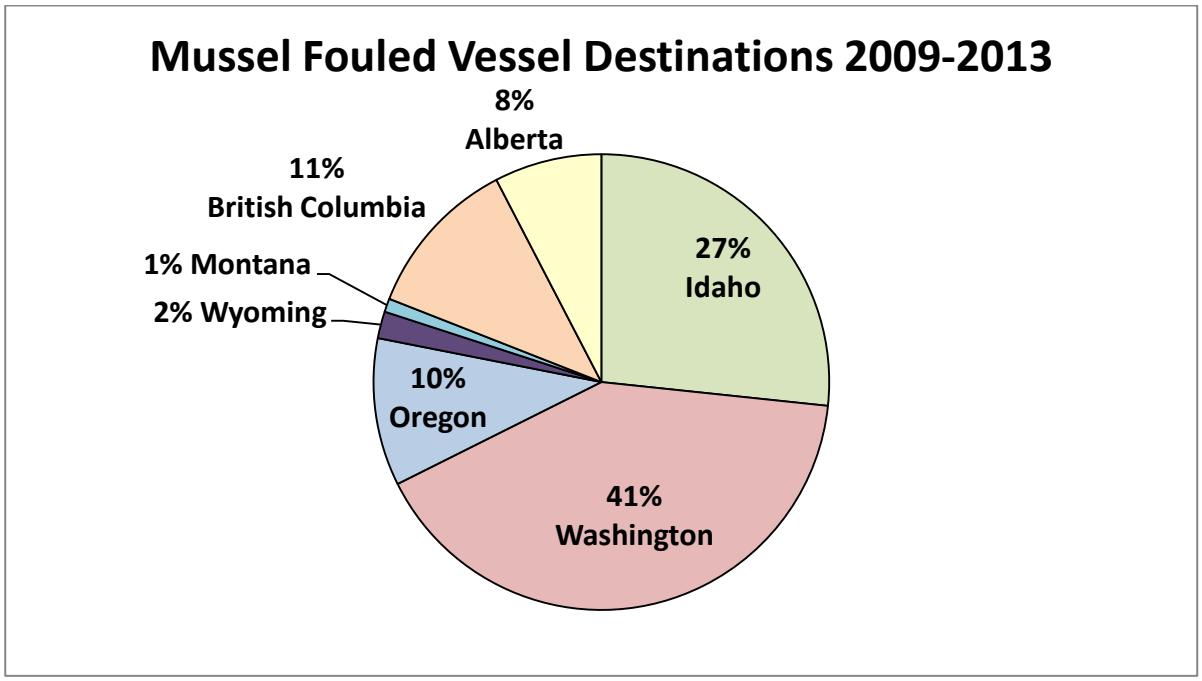

Figure 7: Destination of vessels intercepted with zebra or quagga mussels by Idaho's Watercraft Inspection Program. Combined data from 2009 - 2013. Total of 105 fouled vessels.

Evaluating where mussel fouled vessels are coming from and their destinations highlights Idaho's unique geographical location. Mussel fouled watercraft are observed coming from both the Lower Colorado River area as well as from the Great Lakes and Eastern United States. Many of the vessels that are intercepted with mussels are not destined to Idaho and plan to pass through the state to neighboring states and provinces (Figure 8). When a fouled vessel is identified during an inspection in Idaho, the destination state or province is notified and provided with all available information about that watercraft. The interception of these vessels, regardless of their destination, helps protect the waters of Idaho and the region from the introduction of zebra and quagga mussels.

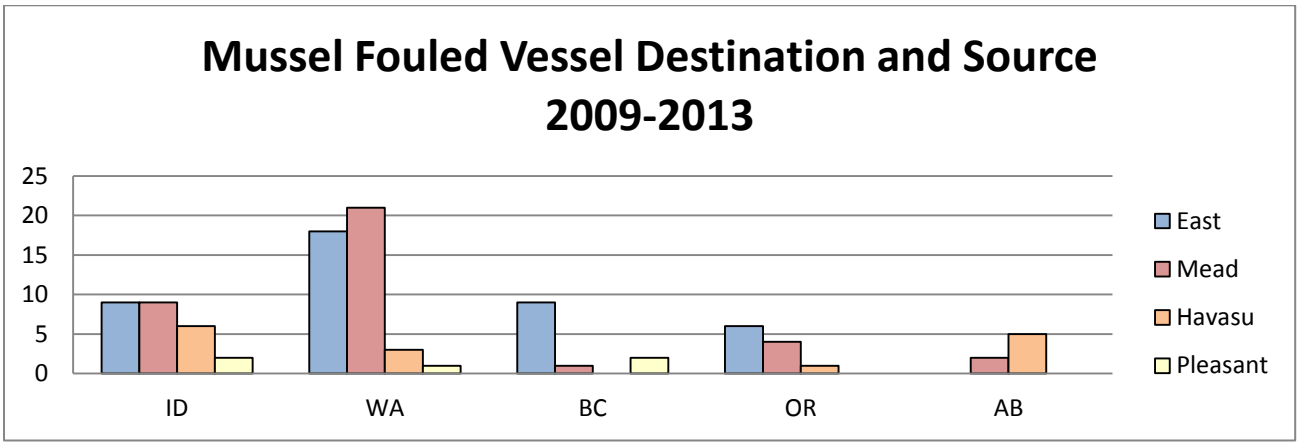

Figure 8: Destination and source of zebra and quagga mussel fouled vessels intercepted by Idaho's Watercraft Inspection Program. Combined data from 2009 - 2013 showing highest frequency destinations of Idaho, Washington, British Columbia, Oregon and Alberta.

The time of year when mussel-fouled watercraft have been intercepted indicates that mussel-fouled vessel movement peaks in April and May. This is due in large part to "snow bird" traffic returning home from spending the winter months in Lakes Mead, Havasu and Pleasant (Figure 9).

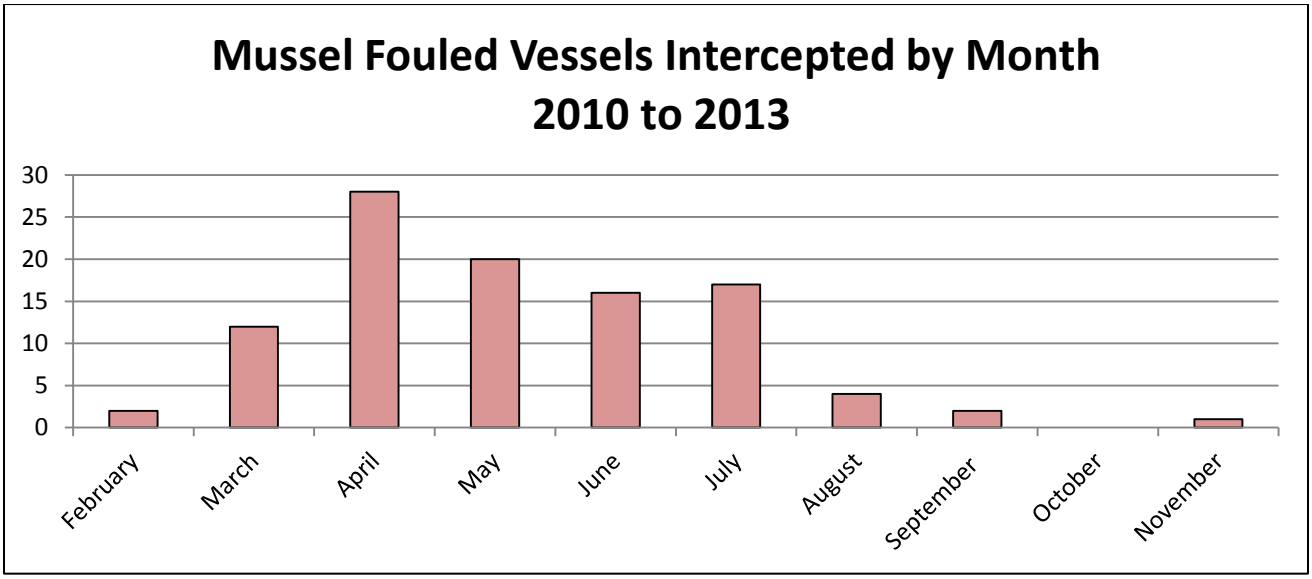

Figure 9: Number of mussel fouled watercraft intercepted per month. Idaho watercraft inspection data 2010 - 2013.

A number of other aquatic invasive species have been identified on vessels at Idaho Watercraft Inspection Stations. Species such as Asian clams, New Zealand mudsnails, Eurasian watermilfoil, curlyleaf pondweed, and Brazilian elodea have all been found on vessels inspected in Idaho.

Commercially Hauled Vessels

Large vessels that are rarely removed from the water have the highest probability of transporting a high number of mussels. These vessels are often transported by a commercial hauler and oversized load permits are required from ITD for the larger vessels. The ITD Oversize Load Permit provides notification to the hauler that it is illegal to possess or transport zebra or quagga mussels in the state, and ITD provides copies of the permits to ISDA. ISDA sends a letter to each hauler that is issued a permit notifying them of Idaho statute (Figure 10). ISDA then follows up on suspected loads to ensure they are cleaned, drained, and dried. ITD Port of Entry (POE) staff have been trained for watercraft inspection in order to assist in identifying commercially hauled watercraft that may be transporting mussels. When ITD suspects that a commercial hauler is transporting a fouled watercraft, they hold that vehicle at the POE until a more detailed inspection can be conducted by ISDA.

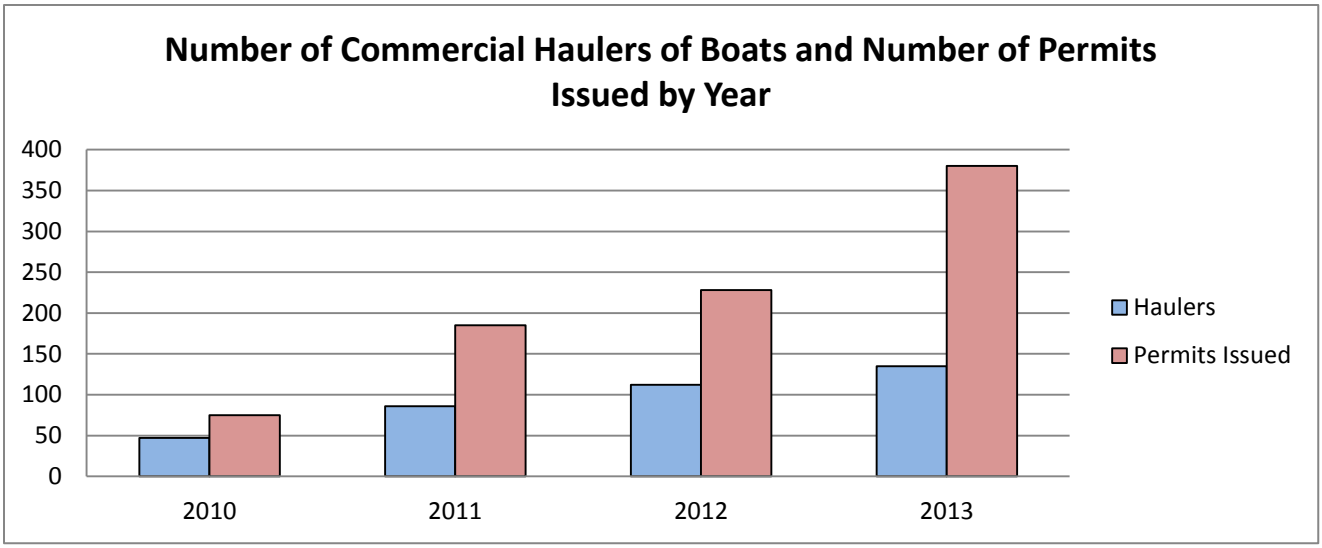

Figure 10: Number of commercial hauling companies or individuals and number of permits issued for the transport of oversize load vessels to and through the state of Idaho. Data represents 288 hauling companies and 868 permits issued. Permits provided to ISDA from ITD from 2010 - 2013.

The greatest number of commercially hauled vessels that were intercepted transporting zebra or quagga mussels occurred in 2012 (Figure 11). The total included 20 mussel fouled barge sections that were being transported from Lake Mead to Seattle, Washington and Astoria, Oregon. In addition to the barge sections, 18 other commercially hauled vessels were found with mussels that year.

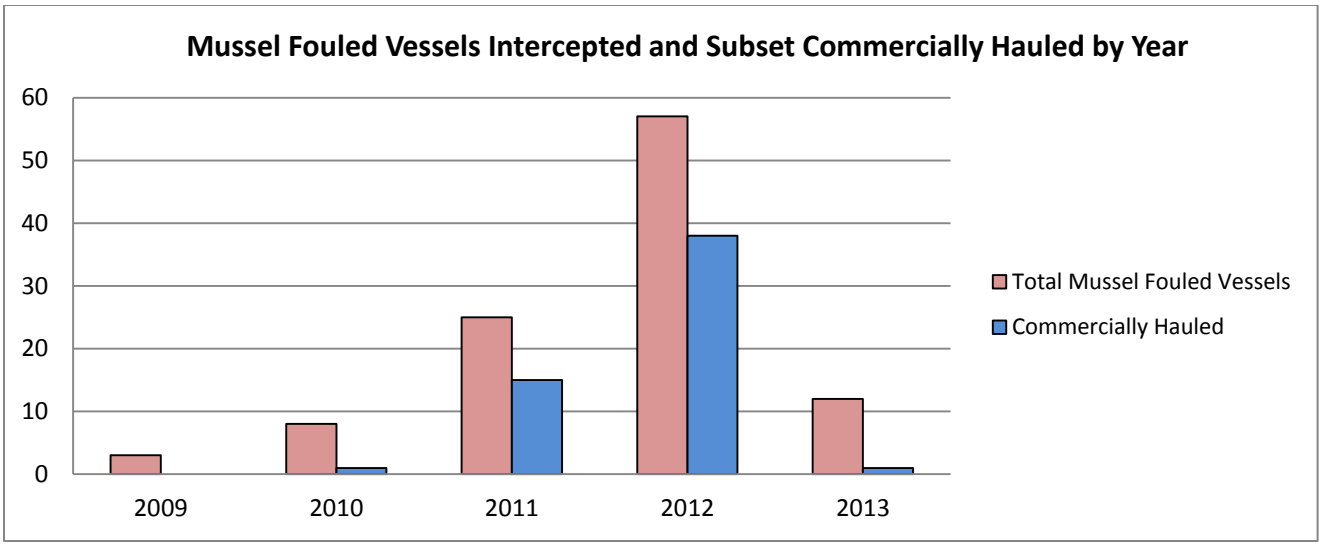

Figure 11: Total number of zebra and quagga mussel vessels intercepted by Idaho's Watercraft Inspection Program by year and subset of those that were commercially transported. Of the 105 total mussel fouled vessels, 55 were commercially hauled. Data from 2009 - 2013.

The number of mussel-fouled vessels that were commercially hauled drastically dropped in 2013, and this may be the result of several factors. First, commercial haulers are becoming more aware and compliant for hauling only clean boats. The fines and delays involved with transporting mussel-fouled vessels are significant and most haulers understand that they are responsible for what they are transporting. Second, roadside watercraft inspection increased significantly throughout the region in 2012 and 2013. A vessel that is being transported any significant distance can expect to be inspected several times. Communication with commercial companies that transport watercraft indicates that most understand the issue and are willing to work with the Western States to transport only clean boats.

Mussel Viability

It is difficult to determine with absolute confidence that all of the mussels on a vessel are alive or dead. Mussels tend to seek out hidden and protected areas on a vessel, such as behind or inside engines and water intakes. This fact makes mussels difficult to find and also helps to protect them from desiccation and death.

Records for mussel-fouled vessels intercepted by Idaho's program were reviewed in an attempt to determine the viability of mussels found on each fouled vessel. Using information and observations collected by inspectors, (including time out of the water, condition of the mussels observed, and condition of the boat), an estimate was made as to whether mussels on the vessel were alive or dead. This is a coarse estimate, but provides insight into the risk that vessels from various areas pose for the transport of live mussels. An evaluation of the data suggests that about 11% of the mussel-fouled vessels that originated from the Great Lakes and Eastern United States were out of the water for less than 30 days and therefore, could carry viable mussels. In comparison, an estimated 70% of the vessels that were intercepted from Lakes Mead, Havasu, and Pleasant that appeared to have had live mussels and had been out of the water less than 30 days (Figure 12). This estimate implies that a mussel-fouled vessel from the southwestern United States is more likely to have been recently in the

water and thus is more likely to have live mussels than vessels intercepted from Eastern points of origin.

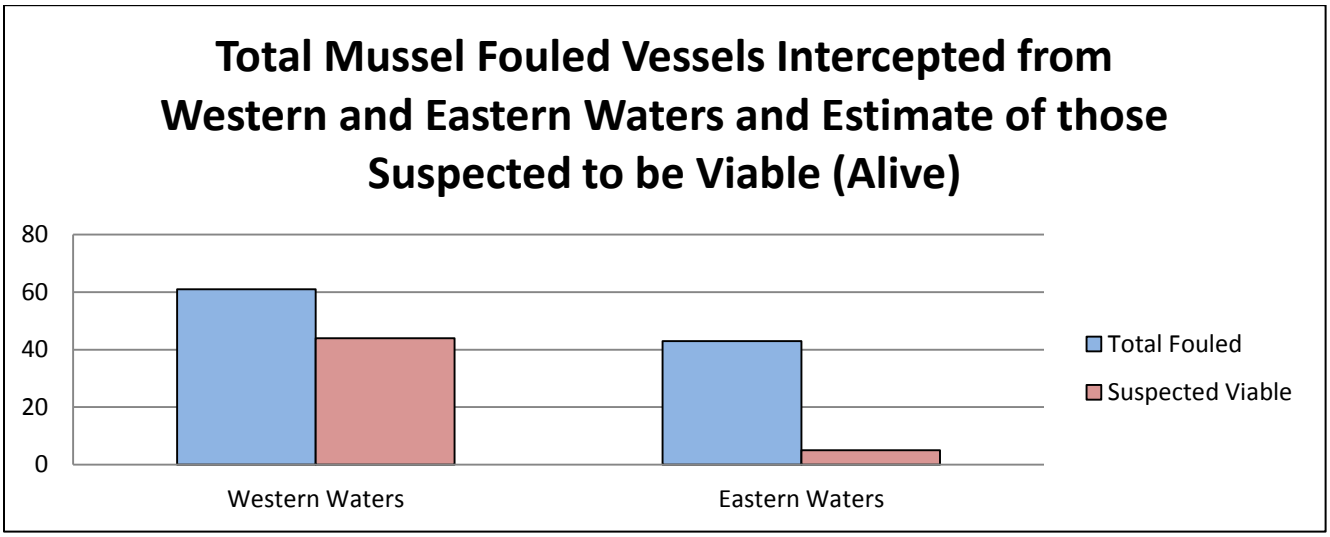

Figure 12: Total number of zebra and quagga mussel fouled watercraft intercepted by Idaho's Watercraft Inspection Stations divided into western and eastern sources and estimated subset of those that were suspected to be viable (alive). Combined data from 2009 - 2013. Total of 105 fouled vessels.

This estimate is supported by the "Water bodies visited in the previous 30 days" inspection data that is reviewed in the "Other High Risk Vessels" section below. These data indicate a large volume of boater traffic coming through Idaho's inspection stations has recently visited water bodies in the Lower Colorado River area.

Other High Risk Vessels

One of the questions that Idaho Watercraft Inspectors ask boaters during an inspection is "What water bodies have you visited in the previous 30 days?" This provides information on the level of risk that a vessel presents for transporting AIS. If the vessel has recently been in a water body that is infested by zebra or quagga mussels, there is a high risk that it is transporting mussels, either as adults or veligers. This risk is even higher if it has not received a decontamination or hot water wash after leaving the infested water body. Significant numbers of vessels report recent visits to Lake Mead and Lake Havasu. To a lesser extent, boaters report recent visits to Lake Mohave, Lake Pleasant and to areas around the Great Lakes and Eastern United States (Figure 13).

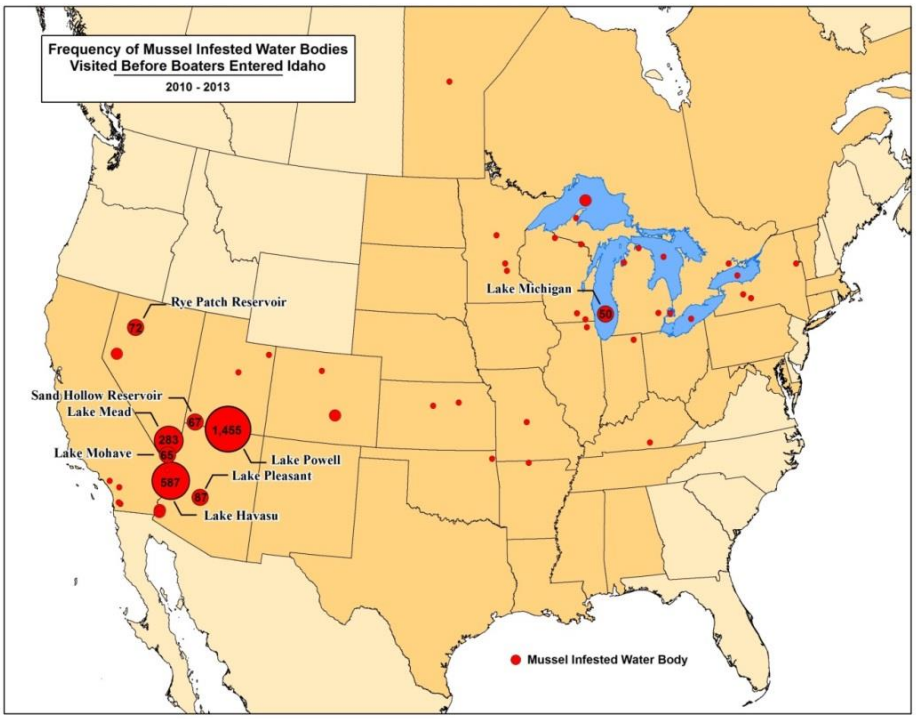

Figure 13: Mussel fouled water bodies visited in the previous 30 days and number of visit for the most frequently visited. Combined Idaho Watercraft Inspection Station data from 2010 - 2013.

Lake Powell is the most frequently visited mussel fouled water body by vessels that are inspected in Idaho. Many of these vessels have been out of the water less than 30 days at the time they are inspected, posing a significant risk of transporting both veligers and adult mussels.

Watercraft Inspection data collected in 2013 found 324 vessels that reported use in Lakes Mead, Mohave, Havasu or Pleasant in the previous 30 days; 244 vessels reported recent visits to Lake Powell; and only 17 vessels reported visits to the Great Lakes during the same timeframe. This trend is consistent throughout four years of watercraft inspections (Figure 14).

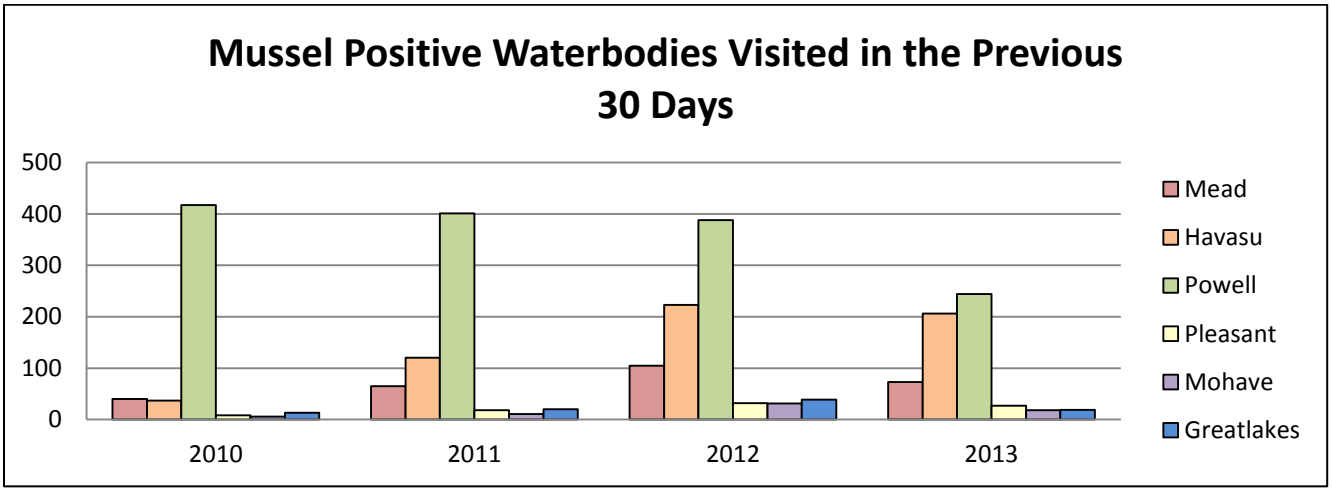

Figure 14: Number of vessels inspected that visited mussel fouled water bodies in the previous 30 days by source. Idaho Watercraft Inspection Station data, 2010 - 2013.

The identification of adult mussels in Lake Powell during the 2013 season presents an alarming development. Watercraft use on Lake Powell is significant. Inspection data from five years of inspections at Idaho watercraft inspection stations show that recent use on Lake Powell is significantly higher than any other mussel-fouled water body. As the development and spread of mussels in Powell progresses, it appears that this lake will be a far more significant source for spreading mussels into Idaho than any other location in North America. For this reason, it is imperative that a program is in place at Lake Powell to ensure that mussels do not leave the lake on watercraft.

Idaho's watercraft inspection data clearly shows significant boat traffic from quagga mussel infested waters at Lake Mead, Lake Havasu, Lake Pleasant, and Lake Powell. At this time, none of these areas have a program in place that successfully inspects and decontaminates all vessels that leave their waters. Steps are being taken to implement an effective program at these water bodies to clean vessels, and a notification program has been initiated to notify states when moored vessels are returning to Northwestern states. These programs are still developing and require additional resources and attention to adequately address the risk of the vessels transporting mussels from these areas. A precedent must be set to contain mussels at their source waters and not allow boats to continue to infest waters throughout the West.

The destination of these vessels is also a concern. The 2013 data indicates a significant number of vessels have recently been in mussel-infested waters are destined for Idaho as well as other states and provinces in the Northwest (Figure 15).

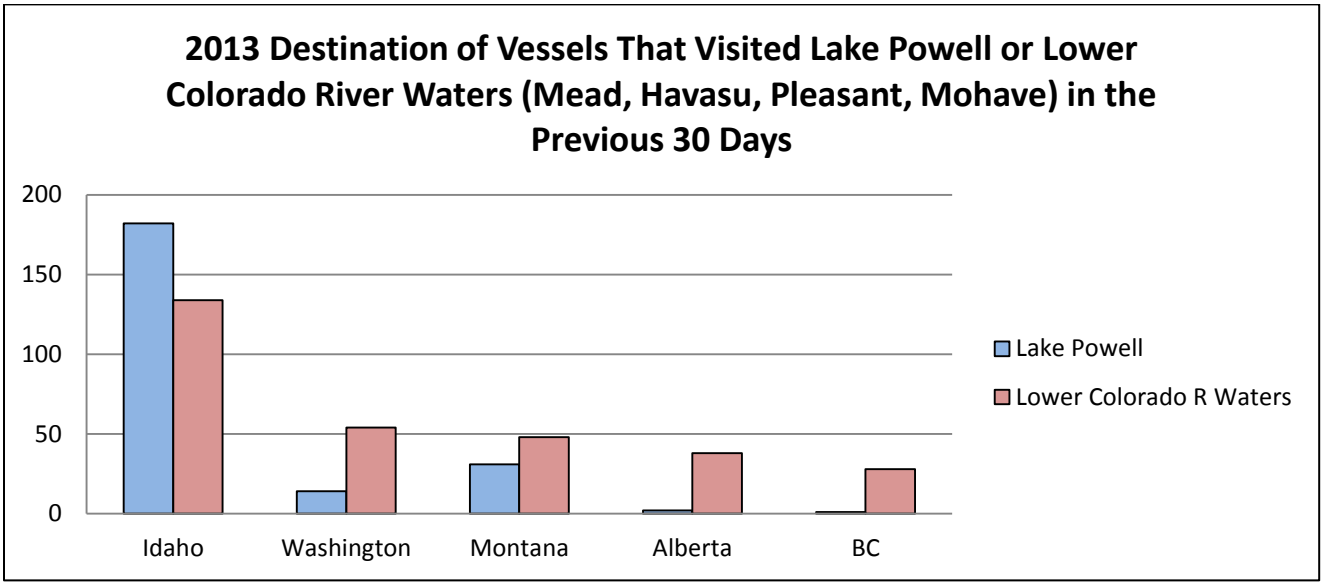

Figure 15: Destination of vessels that report visiting mussel-fouled waters in the previous 30 days. Number of vessels inspected from Lake Powell and the Lower Colorado River area (combined from Lakes Mead, Havasu, Pleasant, and Mohave) and the reported destination. 2013 Idaho Watercraft Inspection Station data.

This data also indicates different timeframes for travel from Lake Powell and the other Lower Colorado River waters. Data suggest that the majority of boaters start leaving Lakes Mead, Havasu, and Pleasant around mid-March and continue through mid-May (Figure 16). This use pattern differs from what is observed for Lake Powell, where the majority of return boater activity occurs in June through August (Figure 17).

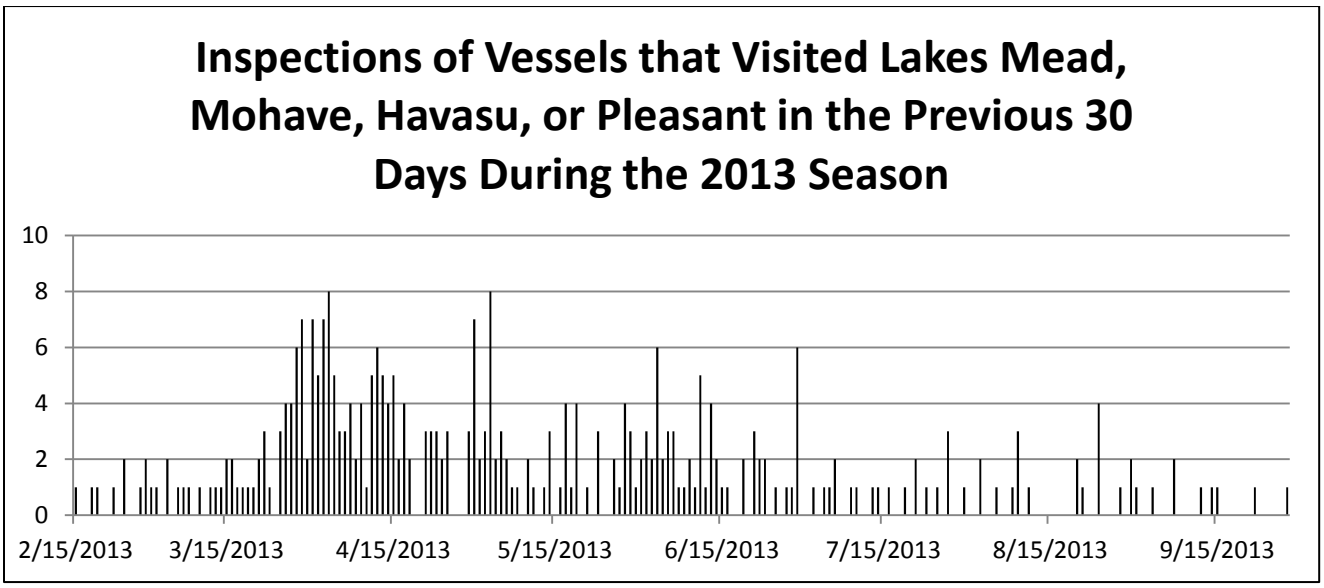

Figure 16: Number of inspections that reported visiting lakes Mead, Mohave, Havasu or Pleasant in the previous 30 days at Idaho Watercraft Inspection Stations over the 2013 season. 324 total inspections.

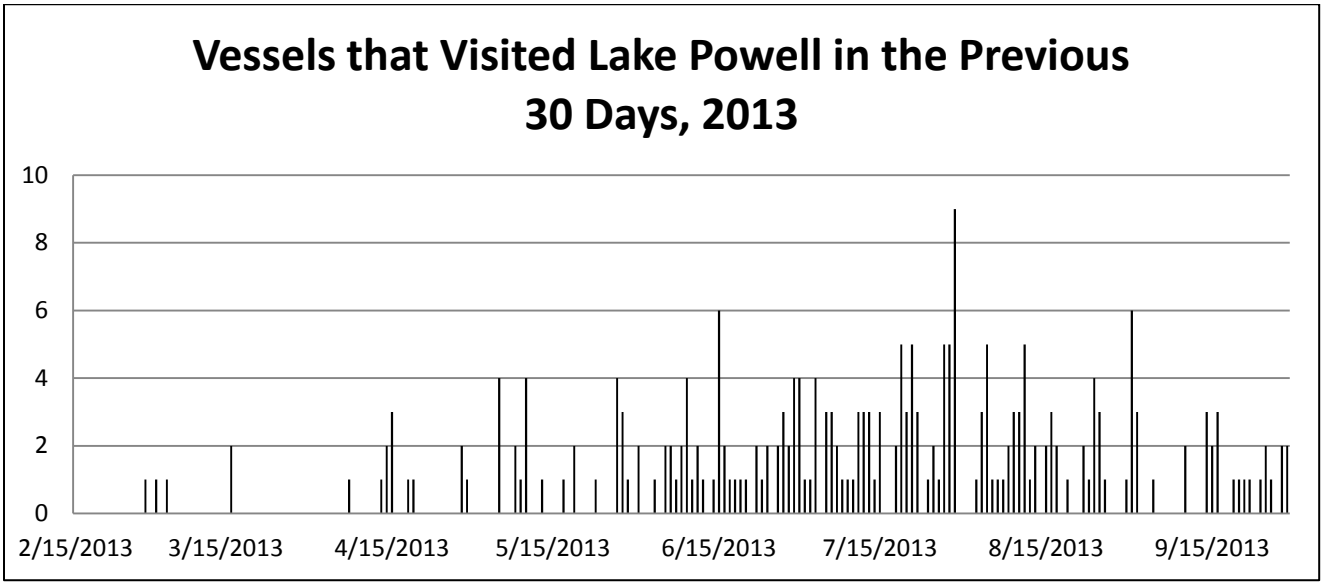

Figure 17: Number of inspections that reported visiting Lake Powell in the previous 30 days at Idaho Watercraft Inspection Stations over the 2013 season. 244 total inspections.

Watercraft Inspection Stations 2013

Idaho's Watercraft Inspection Program conducted 43,778 inspections in 2013 and, of the vessels inspected, 12 boats were found with zebra or quagga mussels. Of those vessels, 5 originated from Lake Havasu, 3 from Lake Mead, 3 from the Great Lakes, and 1 from Lake Pleasant. Also intercepted during the 2013 season were 96 vessels with aquatic vegetation and one with Asian clams. Hot washes were conducted on 500 high-risk vessels during the 2013 season.

Watercraft inspection stations target vessels that originate from specific areas, depending on the travel corridor. The Interstate 90 westbound (Cedars) inspection station inspects many watercraft that

originate from the Great Lakes and Eastern United States. Stations on the southern Idaho border provide particular focus on watercraft that visit mussel-fouled water bodies such as Lakes Mead, Havasu, Pleasant, and Powell. Many of the vessels that are inspected at the stations are destined for Idaho. Many others travel through the state to areas throughout the United States and Canada.

I-90 Westbound (Cedars): Most Idaho stations inspect very few vessels from high risk waters in the Eastern United States. The exception to this is the Interstate 90 Westbound (Cedars) Station. The Cedars station has intercepted more mussel-fouled vessels than any other Idaho station, in part due to boat traffic from the eastern waters. The zip codes from the vessels inspected at this station illustrate the distance people will travel with boats to Idaho (Figure 18). Vessels inspected at the Cedars station have recently visited water bodies around the United States (Figure 19). Many of these water bodies have populations of zebra or quagga mussels, presenting a significant risk for transporting zebra or quagga mussels into Idaho.

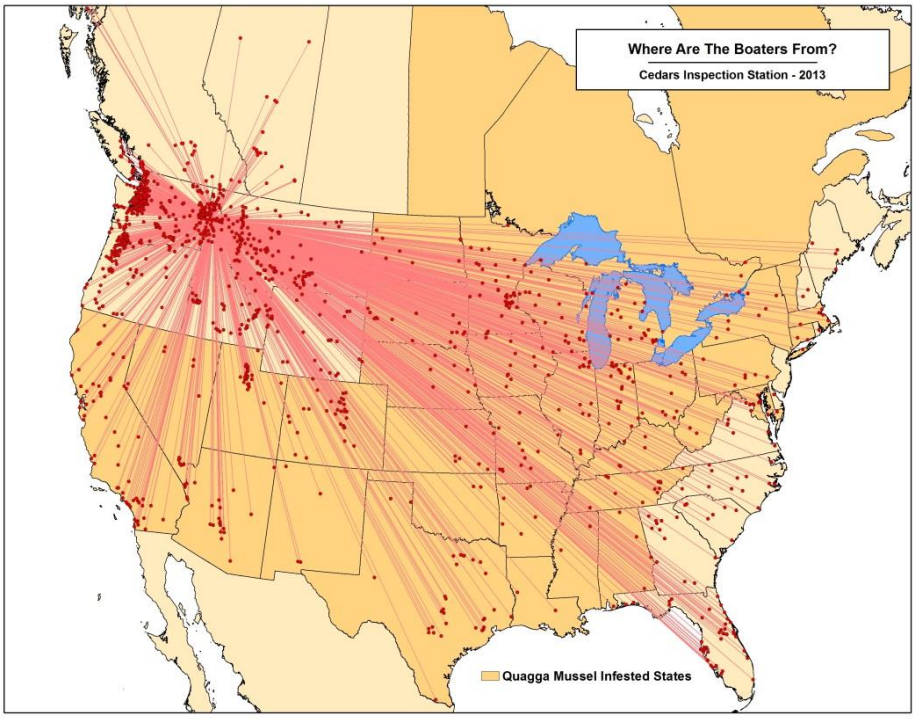

Figure 18: Interstate 90 Westbound (Cedars) Watercraft Inspection Station data showing where watercraft were traveling from (using zip code data) during the 2013 season.

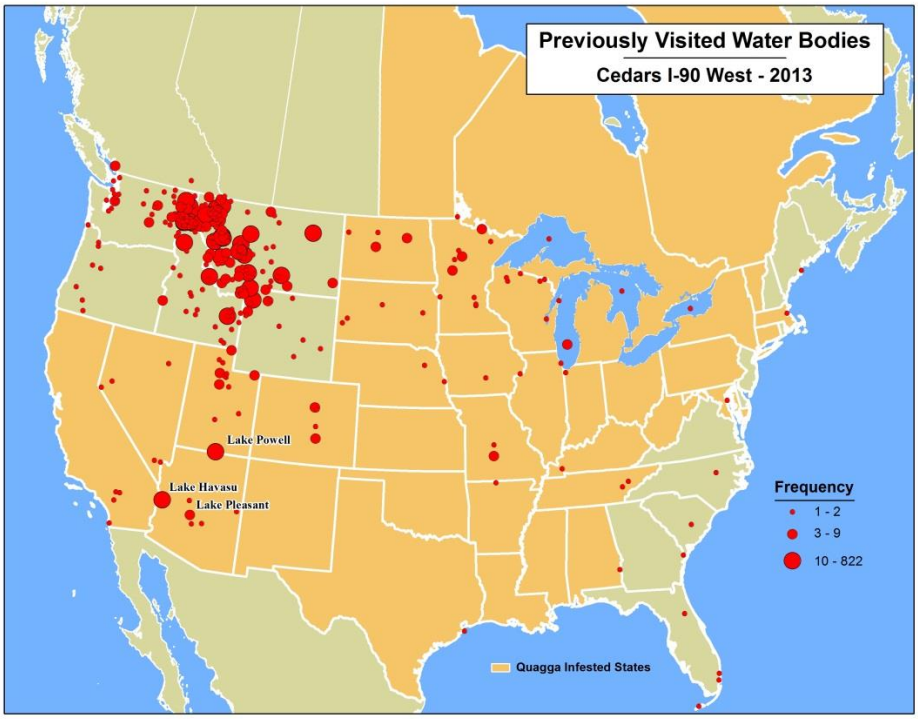

Figure 19: Interstate 90 Westbound (Cedars) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days and frequency of those visits during the 2013 season.

Most of the vessels inspected at the Cedars station are destined for northern Idaho, Spokane, Washington, or the Seattle, Washington area (Figure 20).

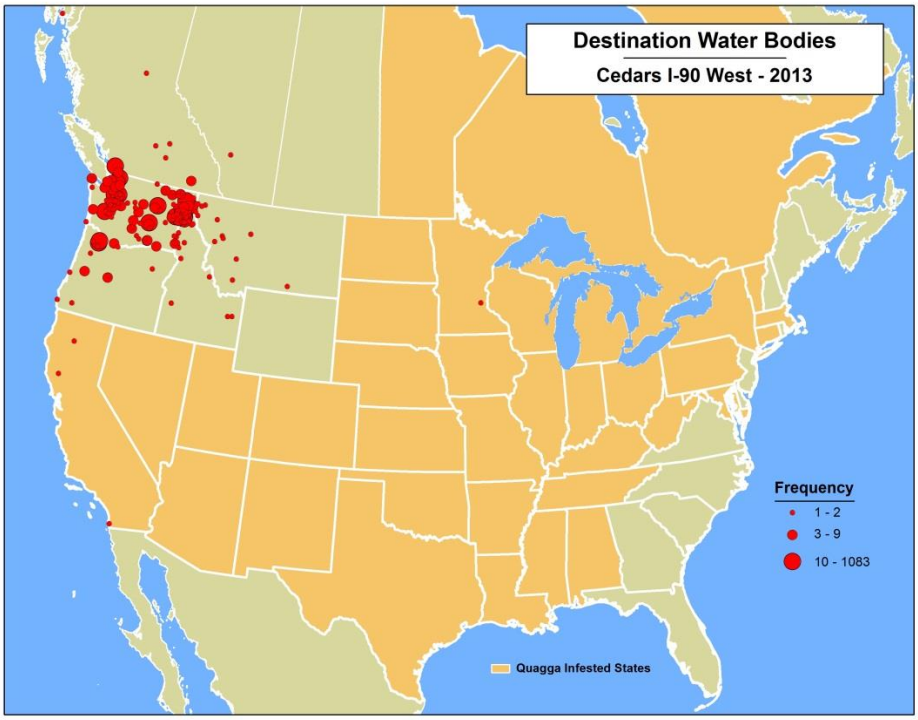

Figure 20: Interstate 90 westbound (Cedars) Watercraft Inspection Station data showing destinations and frequency for vessels inspected during the 2013 season.

Highway 93 Northbound (Jackpot): The Jackpot station inspects many high-risk vessels that have been in the Lower Colorado River region in the previous 30 days. The destination of many of these vessels is to Idaho; however, many also travel through Idaho to other areas (Figure 21).

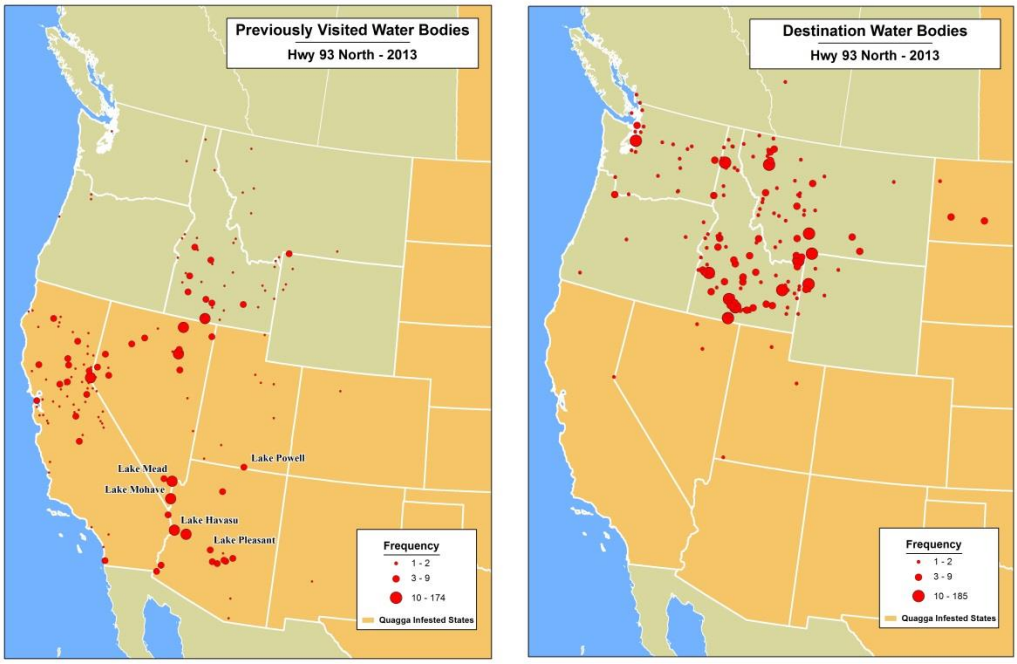

Figure 21: Highway 93 Northbound (Jackpot) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Interstate 15 Northbound (Malad): The Malad Station also inspects many high-risk vessels from the Lower Colorado River area that have recently been in mussel infested waters (Figure 22).

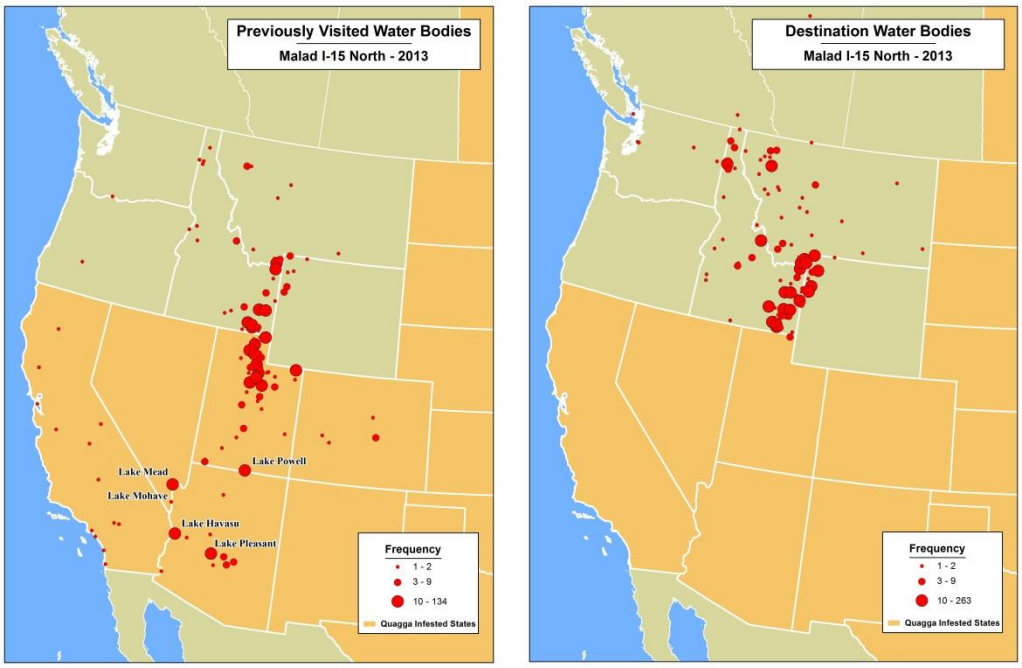

Figure 22: Interstate 15 Northbound (Malad) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 95 Northbound (Marsing): The Marsing station inspects many vessels coming from California, Nevada and water bodies in eastern Oregon. Both the Marsing and Bruneau inspection stations operate in cooperation with the Owyhee County Sheriff's department and have a deputy present for all shifts to assist with station compliance and watercraft inspection (Figure 23).

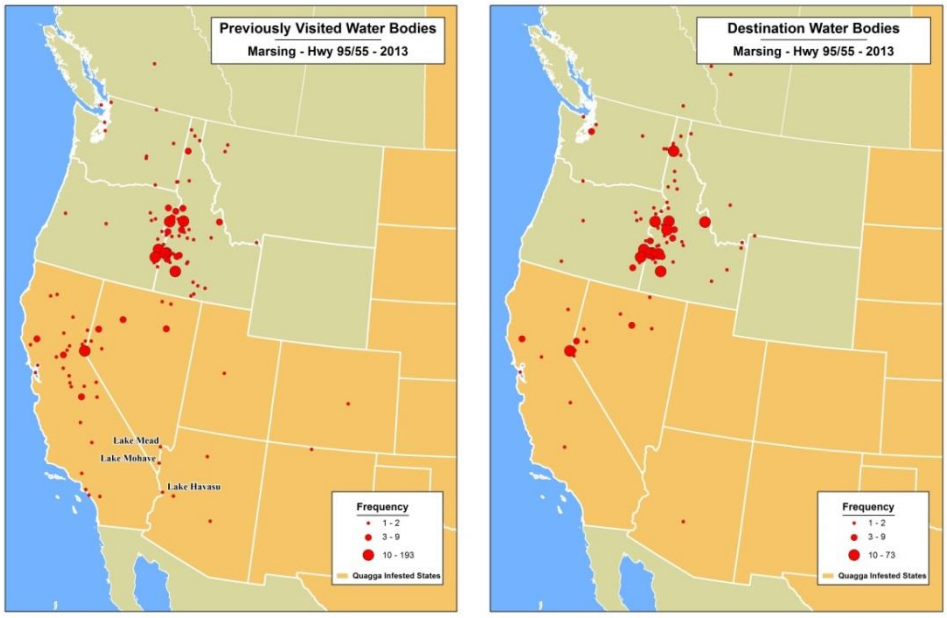

Figure 23: Highway 95 Northbound (Marsing) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits and destination following inspection during the 2013 season.

Highway 51 Northbound (Bruneau): The Bruneau station inspects vessels on both Highway 51 Northbound and on Highway 78. This station sees a number of high-risk vessels that have recently visited water bodies in Nevada and Arizona (Figure 24).

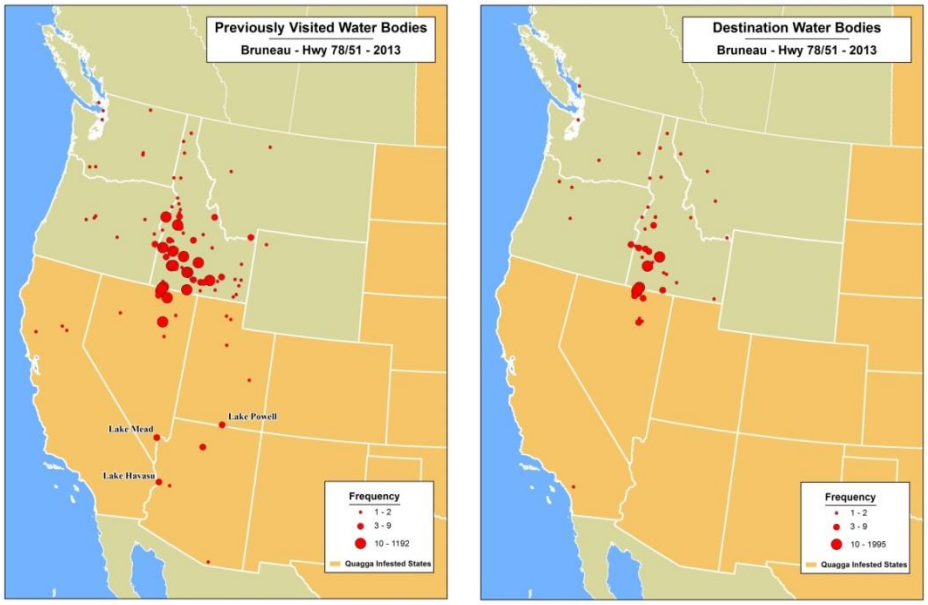

Figure 24: Highway 51 Northbound (Bruneau) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 91 Northbound (Franklin): The Franklin inspection station inspects many vessels from the Wasatch Front area of Utah, as well as a large number of vessels that have recently visited Lake Powell. Most of these vessels are destined for waters in eastern Idaho (Figure 25).

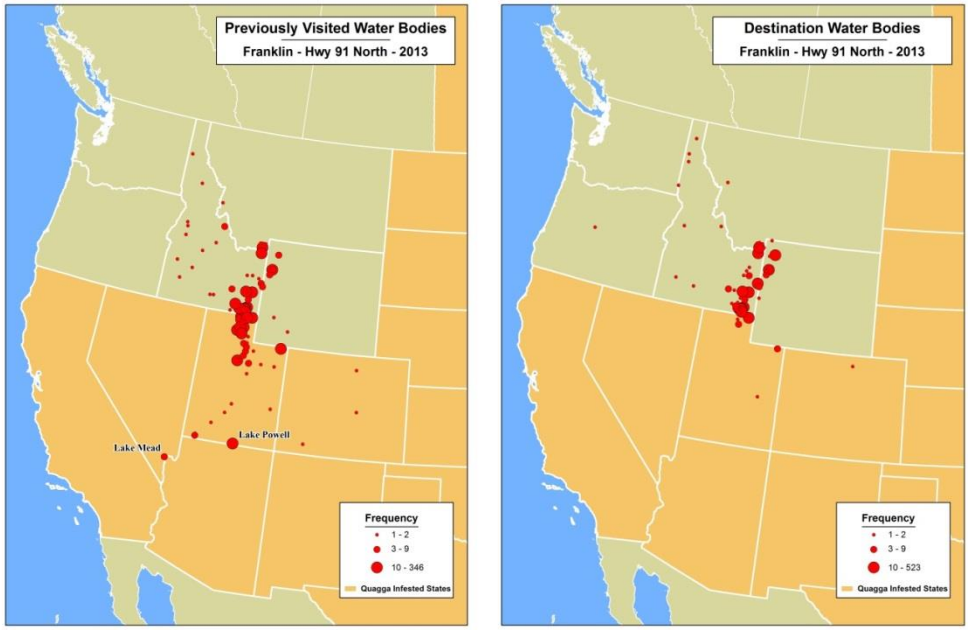

Figure 25: Highway 51 Northbound (Franklin) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 89 Northbound (Bear Lake): The Bear Lake station also inspects many vessels that originate from the Wasatch Front area of Utah, but also sees a large number of high-risk vessels. The majority of vessels inspected at this station are destined for Bear Lake (Figure 26).

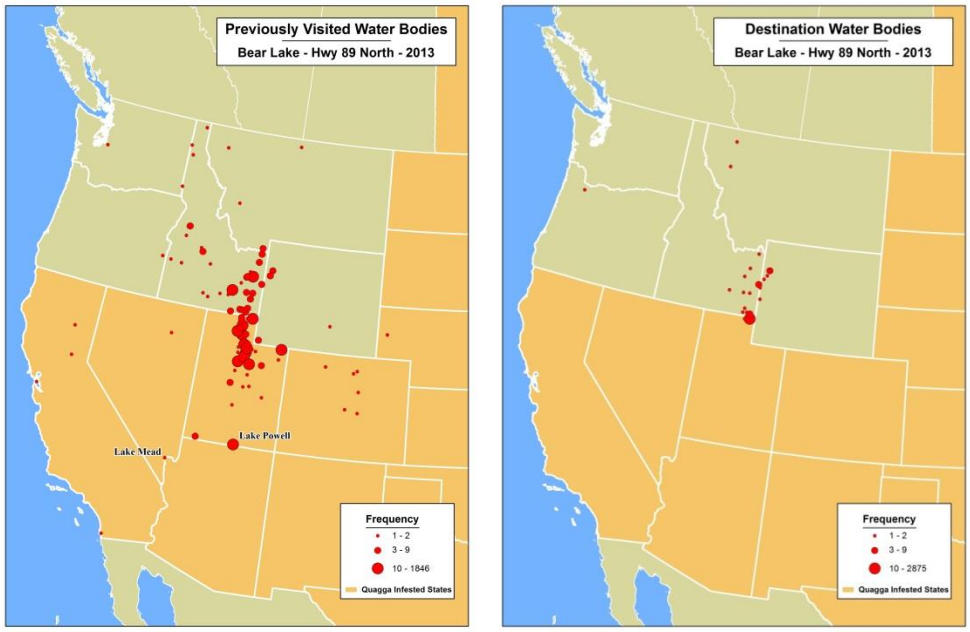

Figure 26: Highway 89 Northbound (Bear Lake) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 20 Southbound (Henrys Lake East) and Highway 87 Southbound (Henrys Lake West): Henrys Lake is known world-wide for excellent fishing and large trout. Watercraft inspection first began at Henrys Lake in 2008 to help protect this valuable resource from AIS. In 2013, inspection stations were operated on Highway 20 and Highway 87 in the Henrys Lake region (Figures 27 and 28).

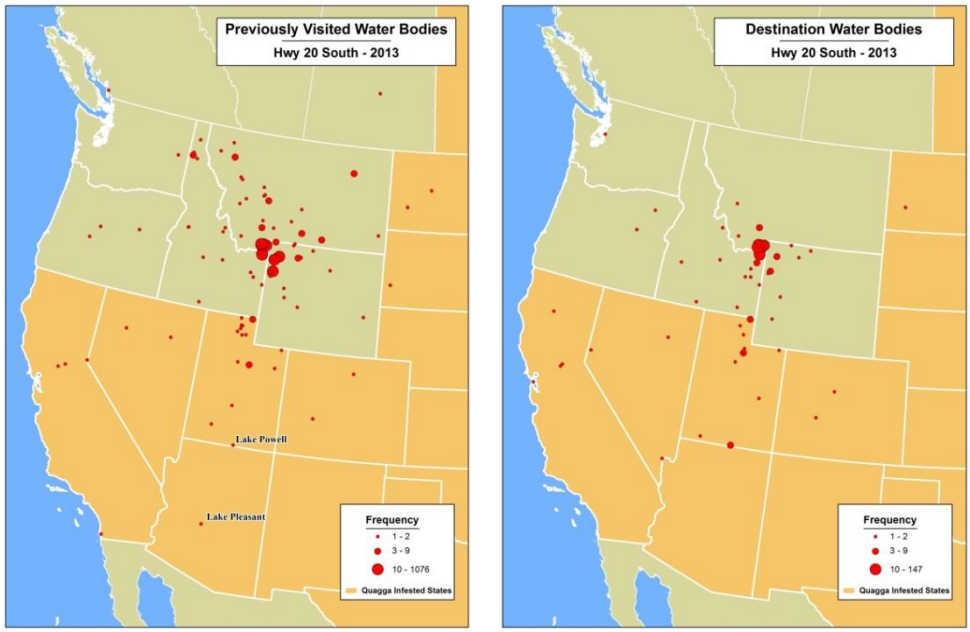

Figure 27: Highway 20 Southbound (Henrys Lake East) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 87 Southbound (Henrys Lake West)

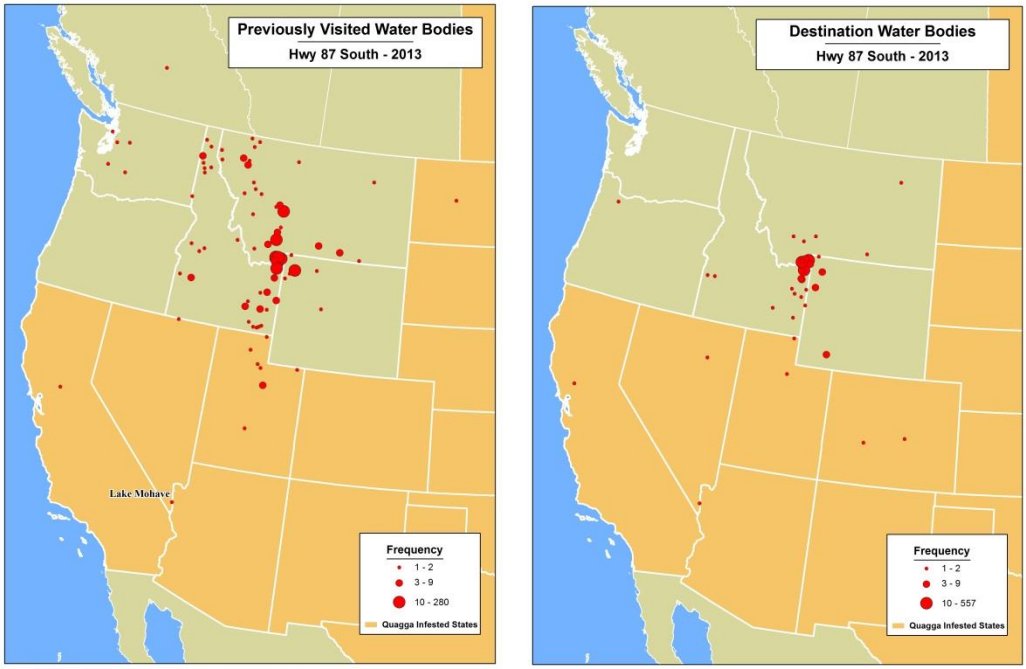

Figure 28: Highway 87 Southbound (Henrys Lake West) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 2 Eastbound (Albeni Falls): The Albeni Falls inspection station inspects vessels that are primarily from the Spokane, Washington area and most are going to Priest Lake or Lake Pend Oreille (Figure 29).

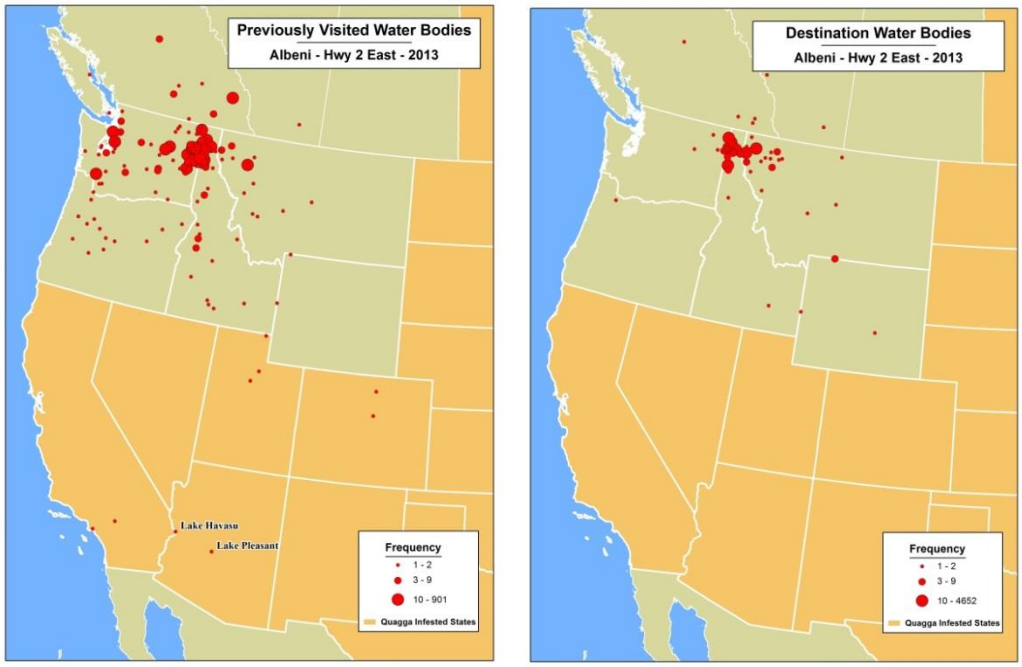

Figure 29: Highway 2 Eastbound (Albeni Falls) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 95 Southbound (Samuels): Watercraft that are inspected at the Samuels station primarily come from Montana, British Columbia and Alberta. Most are destined for the major water bodies of northern Idaho (Figure 30).

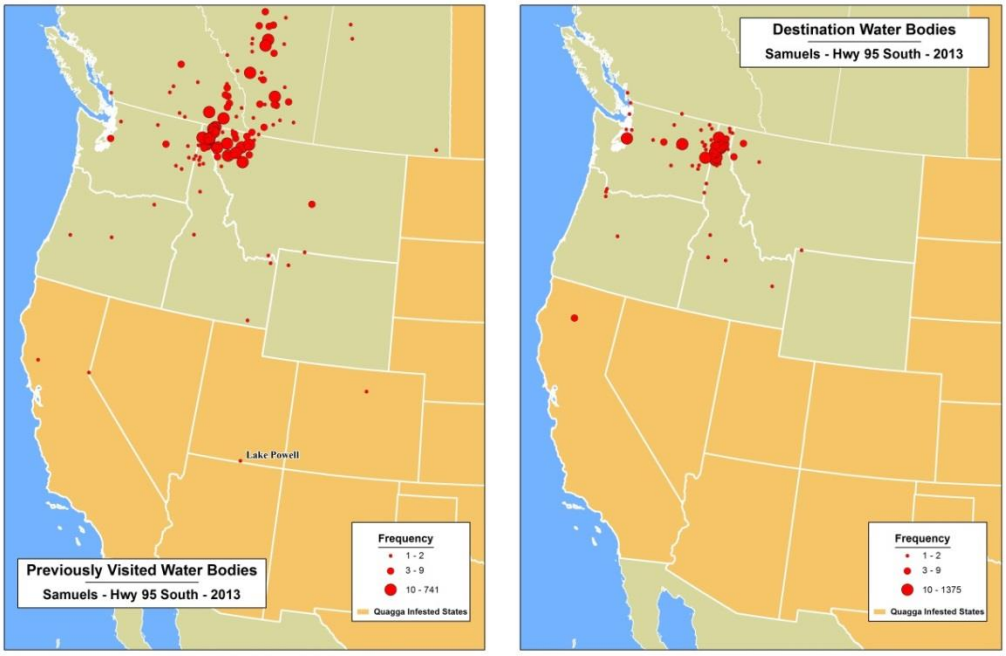

Figure 30: Highway 95 Southbound (Samuels) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Highway 53 Eastbound (Hauser): Watercraft inspected at the Highway 53 station primarily are coming from the Spokane, Washington area heading for water bodies of northern Idaho (Figure 31).

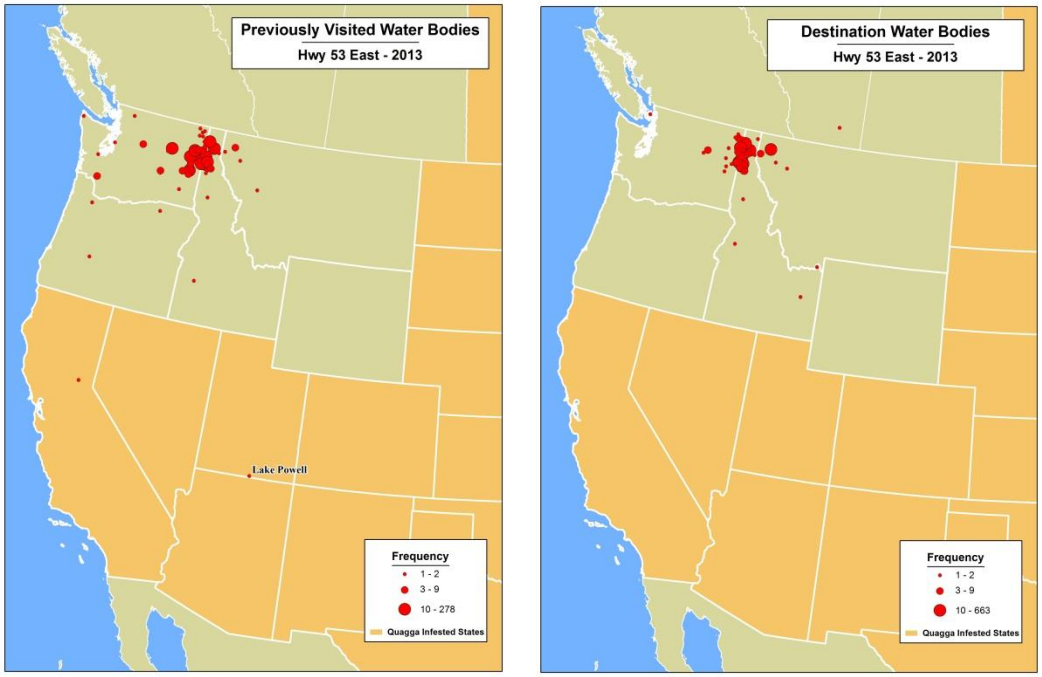

Figure 31: Highway 53 Eastbound (Hauser) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Interstate 90 Eastbound (Huetter): The Huetter station primarily inspects vessels coming from eastern Washington that are destined for water bodies in northern Idaho (Figures 32 and 33).

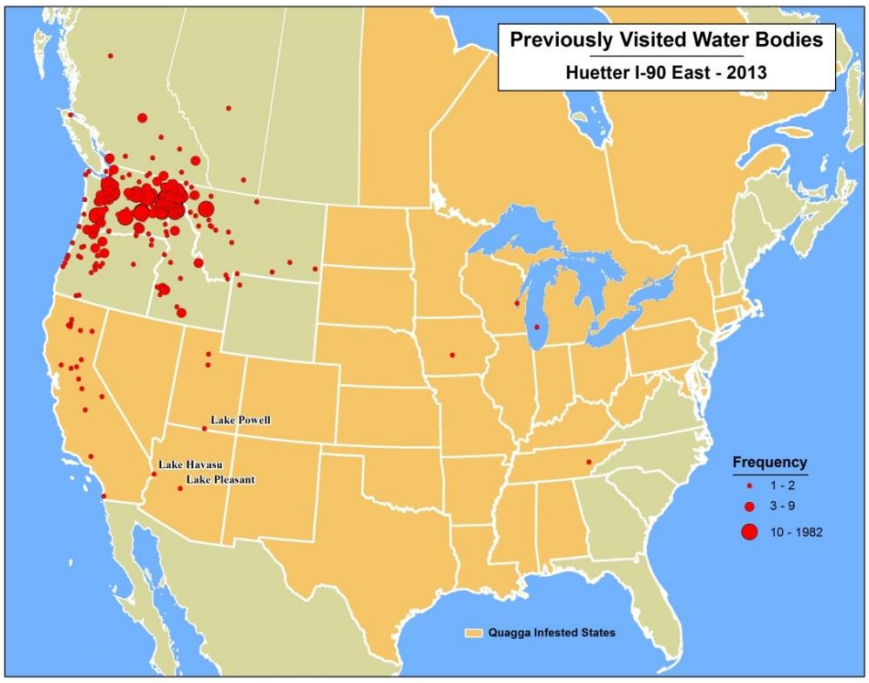

Figure 32: Interstate 90 Eastbound (Huetter) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days and the frequency of visits during the 2013 season.

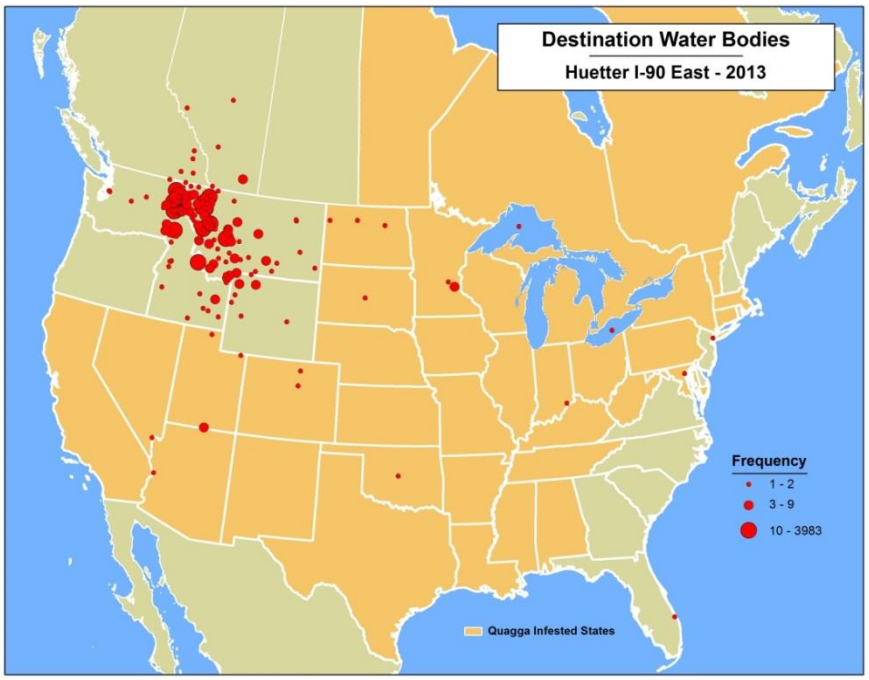

Figure 33: Interstate 90 Eastbound (Huetter) Watercraft Inspection Station data showing destinations following inspection and frequency of visits during the 2013 season.

Redfish Lake: This station is located at Redfish Lake in the Sawtooth National Recreation Area. Watercraft inspections in this area help protect Redfish Lake and the Salmon River system from the

introduction of AIS. This station is funded by the U.S. Forest Service and is operated by ISDA (Figure 34).

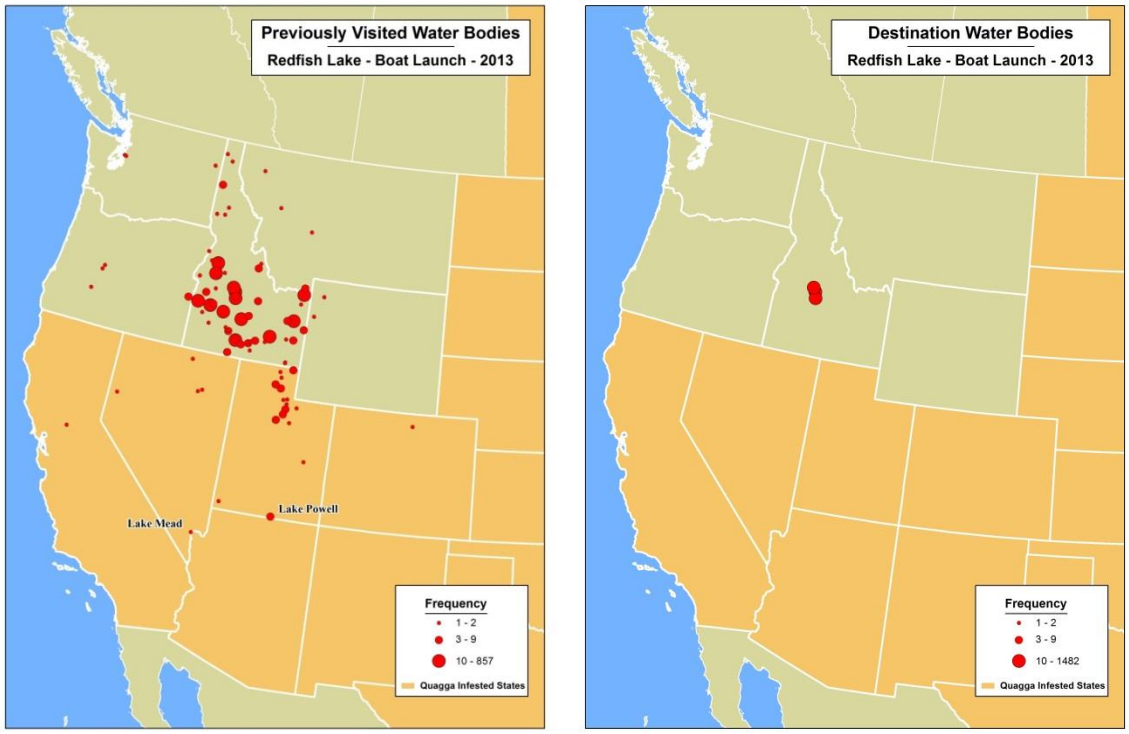

Figure 34: Redfish Lake (Redfish) Watercraft Inspection Station data showing locations watercraft have visited in the previous 30 days, frequency of visits, and destination following inspection during the 2013 season.

Other Watercraft Inspections: Lake Associations in northern Idaho such as Cocolalla and Hauser, originally started inspecting boats under the Eurasian watermilfoil program, dating back to 2006. Today these groups continue to inspect boats, helping to protect their waters from AIS.

High Risk Areas

Zip codes are collected from boaters at inspection stations to determine where boaters are coming from. Some studies support the assertion that boaters will travel long distances to recreate on the water. Boaters travel even longer distances to destination water bodies such as Lake Mead, Lake Havasu, and Lake Powell. An evaluation was conducted on the boater zip code information to determine the volume of boat traffic coming from residents that live within 300 miles of a mussel-infested water body where adult mussels have been identified. This evaluation assumes that boaters who live in relatively close proximity to mussel infested waters (300 miles) pose a greater risk of transporting mussels into the state of Idaho when compared to boaters from other areas. Zip codes were divided into eastern and western "high risk" areas (Figure 35). Evaluation of the data indicates that 85% of the vessels coming from high risk zip code areas were from the Western United States (Figure 36).

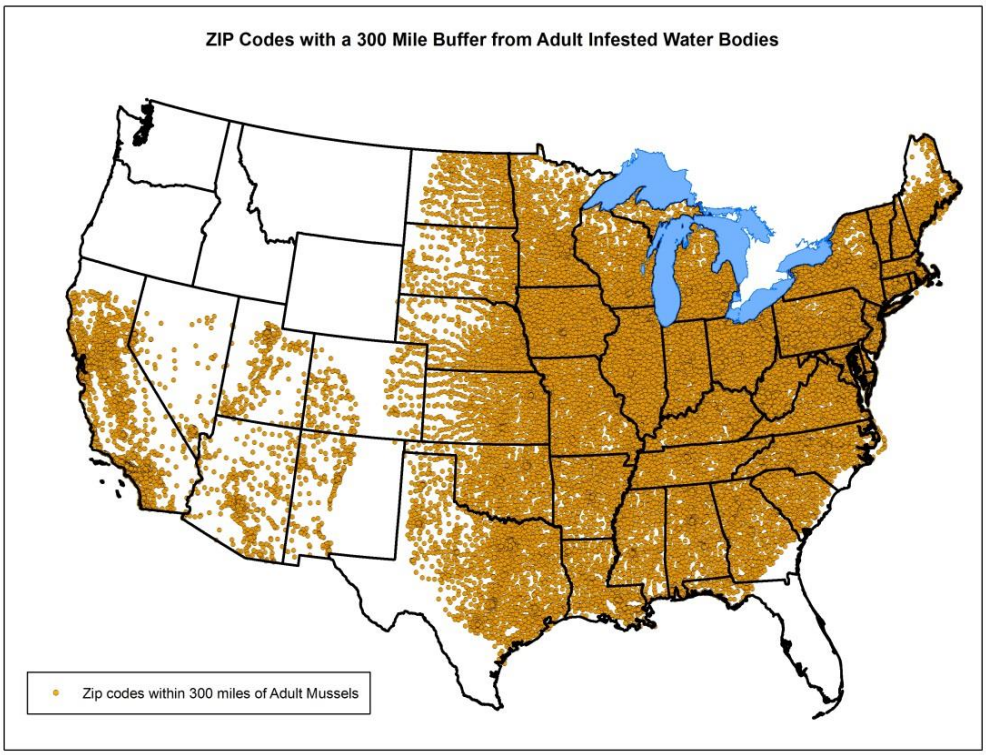

Figure 35: Zip codes of boaters that live within 300 miles of water bodies with identified adult zebra or quagga mussel populations. Zip codes are divided between eastern and western residents.

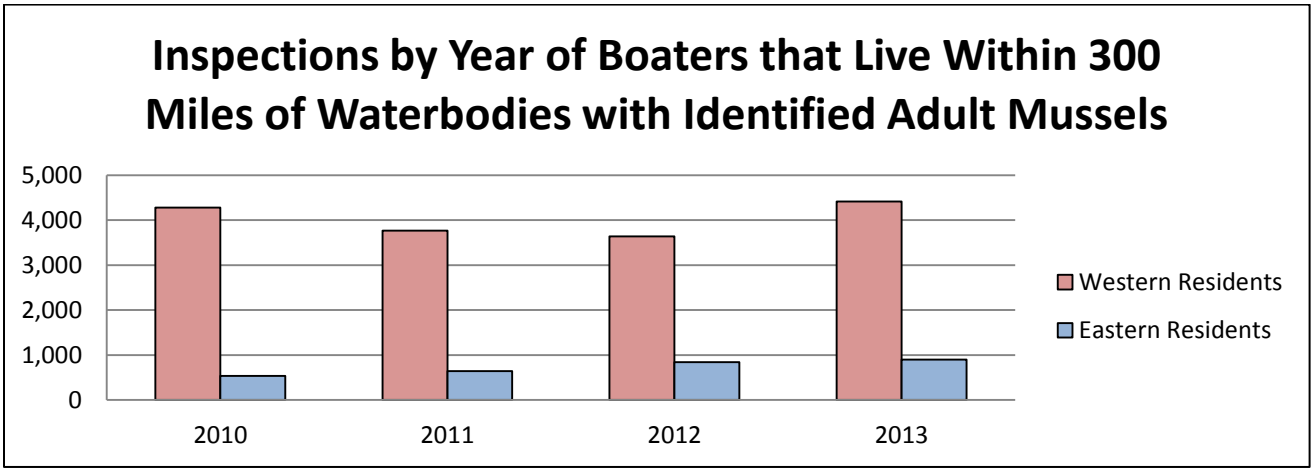

Figure 36: Number of inspections of boaters that report zip codes within 300 miles of water bodies with identified adult zebra or quagga mussels. Idaho Watercraft Inspection Station data by year divided into western and eastern zip codes.

This evaluation further supports the fact that the water bodies in the Southwestern United States pose a significant risk to the waters of Idaho and the Pacific Northwest.

Data Summary

A great deal has been learned through the implementation and the development of this program. A unique opportunity exists to prevent the introduction of an aggressive and potentially devastating invasive species into the region. Idaho, in cooperation with partners within the state and throughout the region, continues an aggressive program to address this threat. The information collected over the

five years of Idaho's Watercraft Inspection Program clearly identifies water bodies that are the primary source for vessels transporting live mussels. Watercraft inspection stations in the Pacific Northwest are only open seasonally and do not operate 24 hours a day, providing an opportunity for a vessel carrying live mussels to enter the region undetected. A vessel of this kind can change the waters and economies of the region forever, and every effort must be made to stop these vessels from transporting mussels at the source waters. Immediate action at the water bodies from which mussel fouled vessels originate is imperative to help stop the further spread of this devastating invasive species. These areas include:

- Lake Powell has the potential to be the most significant source of quagga mussel expansion in the western states and provinces. An operational program must be put in place immediately to inspect, decontaminate, drain, and dry all watercraft at Lake Powell. National and regional support should be a priority to accomplish this goal.

- Lakes Mead, Havasu, Mohave, and Pleasant pose a serious and immediate risk for vessels transporting mussels into Idaho. Inspection and decontamination at these source water bodies is critical. In absence of resources and infrastructure to accomplish this, notification to Idaho on any moored or docked vessel before traveling to Idaho will be critical to ensure inspection and decontamination. National and regional support needs to continue to encourage watercraft inspection, decontamination, and notification from these mussel source water bodies.

- The Great Lakes and the Eastern United States also pose a threat for vessels transporting mussels to Idaho. Vessels from this area will be addressed through continued watercraft inspection and continued work with commercial boat haulers.

Moving Forward

The data collected over the five years of Idaho's Watercraft Inspection Program provides useful insight into boater movement and the risk of invasive species transport. Idaho's watercraft inspection program is currently planning for the 2014 season. In addition to normal watercraft inspection operations, there are a number of initiatives in 2014 that are being pursued in an attempt to improve the prevention of mussel movement on watercraft:

- Idaho plans to operate 15 Watercraft Inspection Stations for the 2014 season. Stations that inspect large numbers of high-risk boats are projected to open in February and continue operation through September.

- The data collected from five years of watercraft inspection in Idaho clearly highlights the significant risk of vessels transporting mussels from infested water bodies on the lower Colorado River (Lakes Mead, Havasu, and Powell) and Lake Pleasant, Arizona. Inspecting vessels that visit these areas will continue to be a priority.

- Idaho continues to work with state and federal agencies and Canadian provinces to improve containment of quagga and zebra mussels at the infested water bodies. Notification to Idaho

and other states when moored vessels leave infested waters is critical to protecting the region. Notification allows Idaho to follow up and inspect these vessels and ensures decontamination before launching in Idaho waters.

- ISDA continues to collaborate with regional partners – including states, provinces, and federal agencies – in an attempt to coordinate watercraft inspection priorities and practices. ISDA continues to share summary data with these partners for the mutual benefit of regional prevention efforts.

- The Great Lakes and Eastern US remain a threat for vessels transporting zebra / quagga mussels into the region. Idaho is actively working with Montana and Wyoming to improve coordination and communication between inspection stations to better address the mussel threat from Eastern waters. Many of the vessels from the Eastern United States are also commercially transported. Outreach continues to the companies that transport these vessels to help ensure that all transported vessels are clean, drained, and dried. ITD also continues to assist with identification of high-risk vessels through assistance by staff at Port of Entry facilities and by providing oversize load boat permits to ISDA.

- Education of the boating public is ongoing and will continue. When boaters practice Clean, Drain, Dry they do their part to protect the valuable water resources of Idaho and the region.

Early Detection Monitoring

ISDA aggressively monitors the waters of the state in an attempt to find invasive species populations as early as possible. Idaho's Early Detection program for invasive species was instituted in 2009, and has continued sampling waters throughout the state every year. Sampling involves the collection of plankton samples from waters that are at high-risk of mussel introduction. The plankton samples are sent to a laboratory for microscopy analysis to detect any presence of zebra or quagga mussel veligers.

Sampling is targeted at high use water bodies in the state and collection is during periods where there is the maximum likelihood of finding veligers in the water column. High-use water bodies are sampled multiple times a season in an attempt to identify small mussel populations, should they exist. In 2013, 525 samples were collected from 68 water bodies. No evidence of zebra or quagga mussels was observed in Idaho, or in any other location in the Columbia River basin during the 2013 season (Figure 37).

Each survey location is also monitored for other invasive species including aquatic plants, snails, crayfish, clams, turtles, and anything else that may be out of the ordinary. This season, new populations of New Zealand mud snails, Chinese mystery snails, Eurasian watermilfoil, curlyleaf pondweed, and Eastern spiny soft shell turtles were observed in the state.

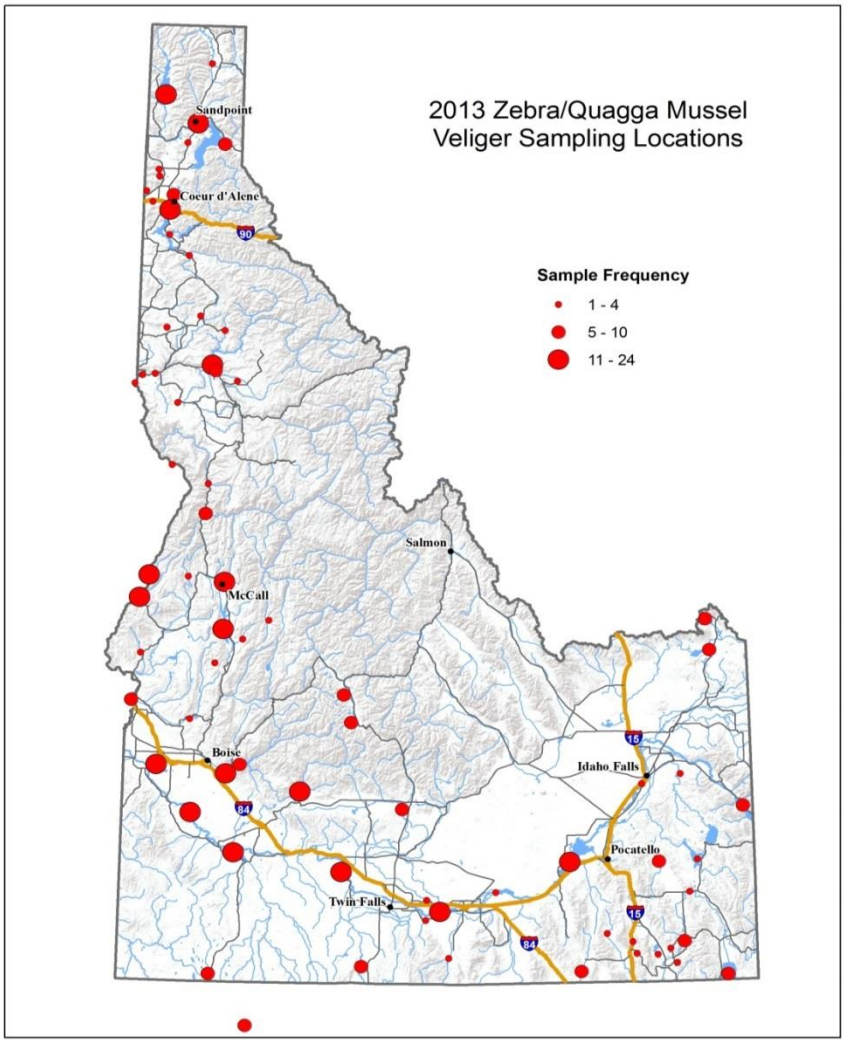

Figure 37: Sampling locations and frequency of sampling for early detection monitoring of zebra / quagga mussel veligers and other AIS in 2013. 525 samples collected from 68 water bodies.