

# Wyoming Aquatic Invasive Species 2019 Program Summary



## PERSONNEL

AIS personnel in 2019 included one permanent coordinator, four 12-month AWEC Regional AIS Specialists, four 9-month AWEC Regional AIS Specialists, and 45 seasonal technicians (31 game and fish funded, 9 Bureau of Reclamation funded, 4 U.S. Fish and Wildlife Service funded, 1 U.S. Forest Service funded).

## OUTREACH AND EDUCATION

Outreach was focused in regions throughout the state with AIS information at local events, fairs, and in schools. Statewide outreach events included the boater appreciation raffle, the Expo event in Casper, and the Denver and Utah Boat Shows.

In 2019, the boater appreciation raffle was again conducted with the goals of thanking boaters for cooperation with watercraft inspections, increasing compliance with watercraft stopping at check stations by incentivizing the inspections, and gathering information from boaters about the inspection process. Information on raffle entry details was included on the back of the watercraft inspection receipt given to boaters after an inspection. Boaters entered the survey online where they were asked a series of questions about their inspection experience. There were a total of 1,540 entries in the raffle survey; of those 808 unique individuals entered the raffle. Although more people entered the raffle than in previous years (694 individuals in 2018), the responses were very similar regarding satisfaction with inspections.

The overall experience by boaters at watercraft check stations was positive with 96.1% indicating they were either very satisfied (86.1%) or satisfied (11.0%). Satisfaction with the timeliness of inspections was also high, with 97.3% of boaters very satisfied (88.1%) or satisfied (9.2%) with the amount of time required for inspection. The majority of respondents (67.3%) waited less than 5 minutes for an inspection with four responses indicating a wait time over 30 minutes. Lastly, boaters rated the professionalism of inspectors high with 97.1% of boaters very satisfied (87.7%) or satisfied (9.4%). The majority of boaters (80.0%) responding to the survey had purchased a 2019 AIS decal at the time of inspection. Raffle respondents were mostly Wyoming residents (50.5%), followed by residents of Utah (21.9%), Colorado (12.9%), Montana (5.2%), and Nebraska (2.7%). Boaters who responded to the raffle survey were from 20 different states.

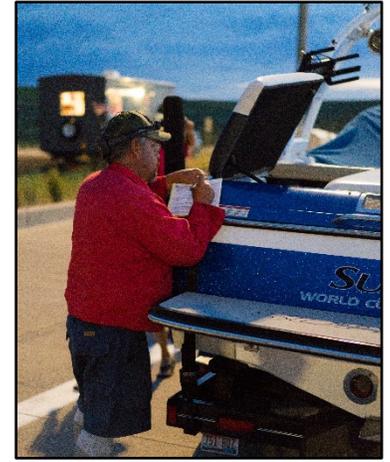
## TRAINING

A total of 19 watercraft inspection and decontamination trainings were conducted in 12 different locations throughout the state. In total, 167 individuals were certified at a course, bringing the total number of inspectors since 2010 to over 1,700. Private individuals were again encouraged to become AIS inspectors and to offer services to the boating public as certified inspection locations. Nineteen (19) locations were authorized as certified inspection locations and many others were certified as private authorized inspectors; 48 of which allowed their information to be given out to the public online to contact for watercraft inspections.

The Fire Equipment Inspection and Decontamination (FEID) manual and online training course were revised in 2018. This joint effort of the Bureau of Land Management, U.S. Forest Service, State Forestry, and Wyoming Game and Fish Department equips fire equipment operators with the tools and certification necessary to inspect equipment for AIS prior to use in Wyoming. In 2019, 54 FEID inspectors were certified from 13 different field offices.

## WATERCRAFT INSPECTIONS

Watercraft check stations were operated from April 13 through September 23 at fourteen permanent check stations at port of entries (POE), rest areas, and other border locations to intercept watercraft entering the state (Figure 1). Roving crews also conducted inspections at waters on a rotating basis. A total of 52,131 watercraft inspections (10.5% increase from 2018) were conducted over 228 days, resulting in 42,796 individual boaters being contacted at all check stations. A total of 4,256 high risk inspections (8.9% increase) were conducted and 529 watercraft required decontamination (18.4% increase; Table 1).



Nineteen watercraft were intercepted with suspected zebra or quagga mussels attached and were completely decontaminated; on all watercraft the suspect AIS were determined to be dead and not viable. Mussel infested watercraft originated from Lake Powell, UT/AZ (7 watercraft); Jordanelle Reservoir, UT (2); Willard Bay, UT (2); East Canyon Reservoir, UT (1); Flaming Gorge WY/UT (1); Rockport Reservoir, UT (1); Pineview Reservoir, UT (1); St Lawrence River, Canada (1); Lake Havasu, AZ (1); unspecified water in Michigan (1); and unspecified water in New York (1). These watercraft were destined for Bear Lake UT/ID (7 watercraft); Flaming Gorge Reservoir, UT/WY (6); Unknown Next Destination (2); Lake Pend Oreille (1); Alcova Reservoir, WY (1); Pinedale, WY (1); and an unspecified water in Washington state (1). Four watercraft (one kayak) were intercepted with suspected Asian Clams aboard. These watercraft originated from Lake Powell UT/AZ (2); Jordanelle Reservoir, UT (1); and an unspecified water in California, and were destined for Flaming Gorge UT/AZ (3) and Bear Lake UT/ID (1).

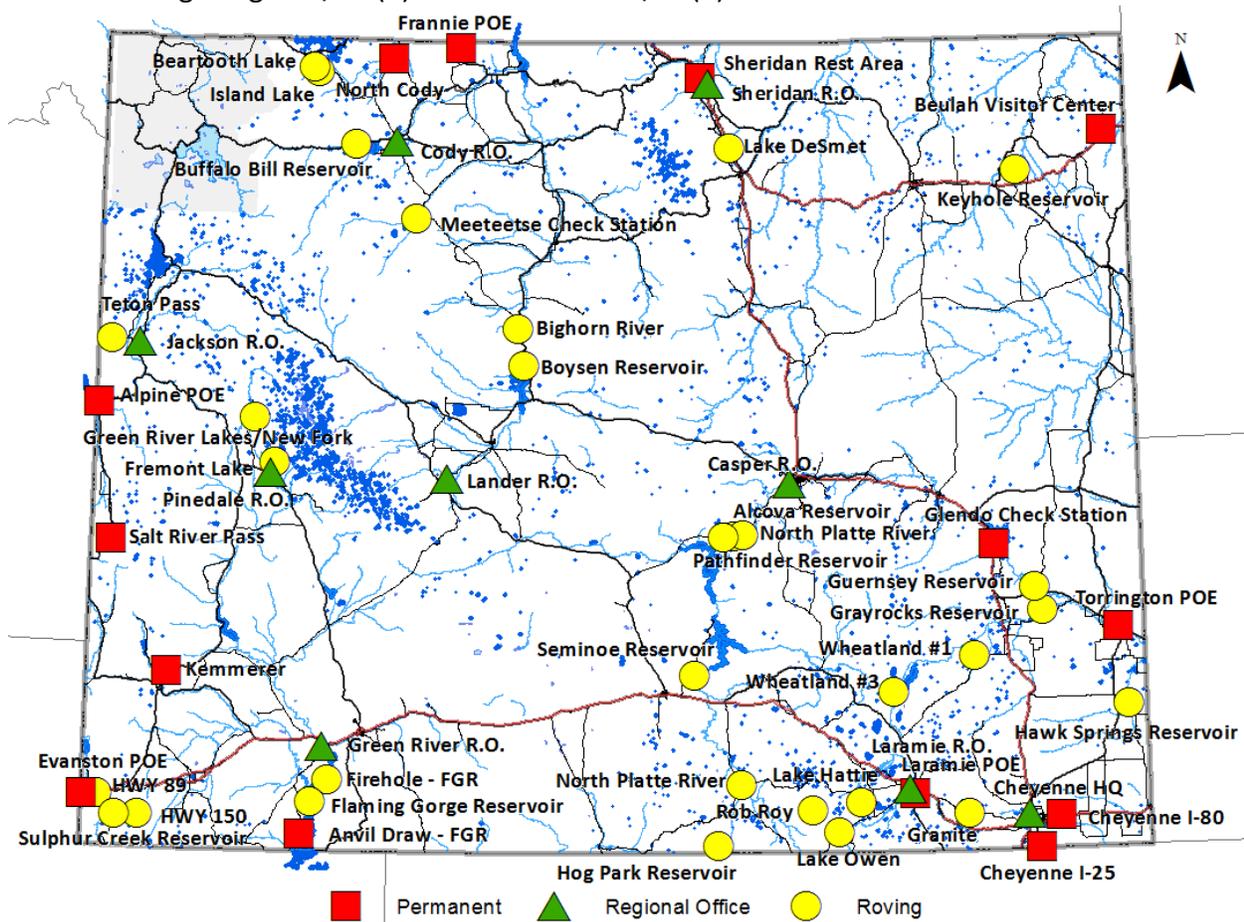


Figure 1. Location of watercraft inspections conducted during 2019 at waters (yellow circle), borders (red square), and regional offices (green triangle).

The greatest number of inspections were conducted at the Evanston I-80 check station (13,585; 16% increase from 2018), followed by Cheyenne I-25 (4,302; 1% decrease from 2018), Alpine POE (3,848; 47% increase from 2018), Glendo Reservoir (3,778; 9% increase from 2018), Anvil Draw (3,541; 24% increase from 2018), and Laramie 287 POE (2,840; 1% decrease from 2018; Figure 2). The highest inspection activity per hour occurred from 11:00am to 1:00pm and the busiest days of the week were Friday (22.0%) and Saturday (21.2%). The highest inspection activity occurred during the week of July 4<sup>th</sup> holiday (Figure 3). Total hours spent conducting watercraft inspections at all check stations and regional offices was about 37,429 hours, for a statewide average of 1.4 inspections per hour. Inspection rate (inspections/hour) ranged from 0.1 at Wheatland Reservoir #1 and Hog Park Reservoir to 3.3 at Alcova Reservoir (Table 1).

Table 1. Total inspections, percent of boats already sealed at time of inspection, high risk inspections, percent of total inspection that were high risk, decontaminations, inspection hours and inspection frequency (inspections per hour) at check stations in 2019.

Check Station	Total Inspections	Percent Sealed	High Risk Inspections	Percent High Risk	Decons	Inspection Hours	Inspection Frequency
<i>CASPER</i>							
Alcova Res.	915	0.7%	6	0.7%	2	279	3.3
Casper Office	109	0.9%	34	31.2%	6	----	----
Glendo Res.	3,778	7.7%	53	1.4%	14	1,492	2.5
North Platte River	423	0%	1	0%	0	181	2.3
Pathfinder Res.	586	0.7%	0	0%	1	228	2.6
Seminole Res.	256	4.7%	1	0.4%	0	139	1.8
Torrington POE	1,041	10.1%	51	4.9%	8	2,011	0.5
<i>CODY/LANDER</i>							
Beartooth Lake	1	0%	0	0%		1	1
Bighorn Lake	1,886	0.4%	0	0%	0	----	----
Boysen Res.	188	6.4%	1	0.5%	0	103	1.8
Cody Office	65	1.5%	17	26.2%	3	----	----
Frannie POE	1,377	5.6%	19	1.4%	7	1,802	0.8
Meeteetse	109	2.7%	1	1.3%	0	81	1.4
North Cody	747	6.7%	29	3.9%	1	1,410	0.5
<i>Green River</i>							
Anvil Draw	3,541	2.0%	41	1.2%	18	2,747	1.3
Evanston POE	13,585	0.4%	1,739	12.8%	296	6,427	2.1
Flaming Gorge	988	2.7%	6	0.6%	0	835	1.2
Green River Office	51	6.2%	8	16.7%	2	26	2.0
High Savery Res.	6	0%	0	0%	0	16	0.4
Kemmerer	1,203	22.4%	25	2.1%	2	961	1.3

Check Station	Total Inspections	Percent Sealed	High Risk Inspections	Percent High Risk	Decons	Inspection Hours	Inspection Frequency
<i>Jackson/Pinedale</i>							
Alpine POE	3,848	1.6%	127	3.3%	5	1,789	2.2
Fremont Lake	308	6.5%	1	0.3%	0	152	2.0
Teton Pass	145	0.7%	3	2.1%	0	76	1.9
Jackson Office	69	2.9%	19	27.5%	5	----	----
Pinedale Office	50	4.0%	15	30.0%	3	----	----
Salt River Pass	896	20.2%	33	3.7%	3	727	1.2
<i>Laramie/Cheyenne</i>							
Cheyenne HQ	59	16.9%	16	27.1%	0	----	----
Cheyenne I-25	4,302	26.8%	581	13.5%	55	3,706	1.2
Cheyenne I-80	1,870	2.1%	729	39.0%	57	2,048	1.1
Granite Res.	287	6.3%	10	3.5%	0	303	0.9
Grayrocks Res.	735	14.1%	11	1.5%	0	544	1.4
Guernsey Res.	32	4.5%	0	0%	0	67	0.5
Hawk Springs Res.	286	7.3%	5	1.7%	0	222	1.3
Hog Park Res.	3	0%	0	0%	0	23	0.1
Lake Hattie	10	10%	0	0%	0	30	0.3
Laramie 287 POE	2,840	8.2%	254	8.9%	21	2,762	1.0
Laramie Office	22	9.1%	2	9.1%	0	----	----
North Platte River	11	0%	2	18.2%	0	21	0.5
Rob Roy Res.	43	2.3%	0	0%	0	45	1.0
Saratoga Lake	13	0%	1	7.7%	0	39	0.3
Wheatland #1 Res.	7	0%	0	0%	0	82	0.1
Wheatland #3 Res.	10	0%	0	0%	0	30	0.3
<i>Sheridan</i>							
Beulah	692	1%	195	28.2%	12	2,086	0.3
Keyhole Res.	2,313	1.2%	23	1.0%	3	1,190	1.9
Lake DeSmet	138	6.5%	6	4.3%	0	170	0.8
Sheridan Rest Area	2,196	19.0%	191	8.7%	8	2,070	1.1
<b>Total/Average</b>	<b>52,131</b>	<b>5.5%</b>	<b>4,256</b>	<b>7.5%</b>	<b>529</b>	<b>37,429</b>	<b>1.5</b>

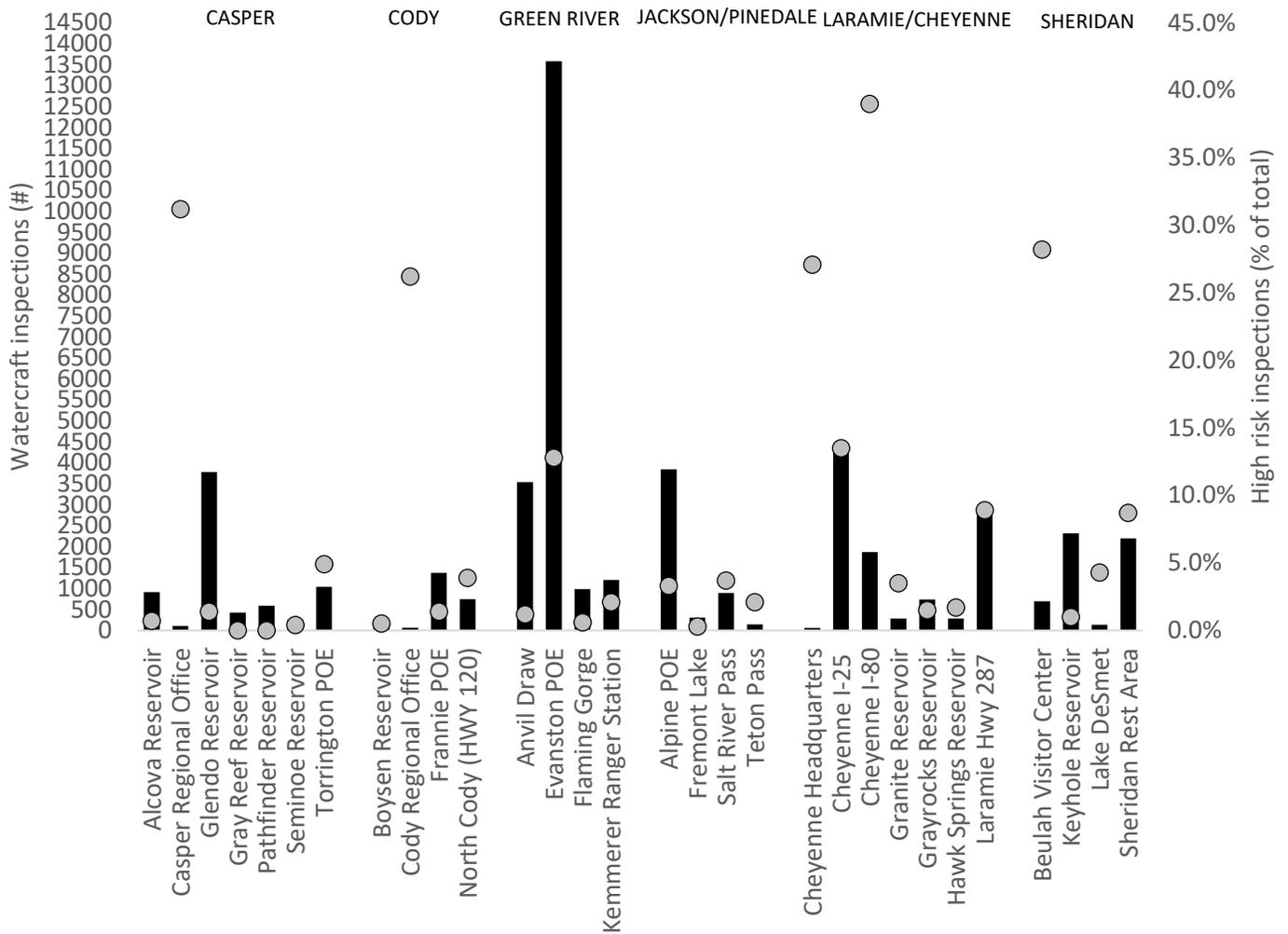


Figure 2. Total watercraft inspections (black bar) and high risk inspections as a percent of the total (gray circle) by check station during 2019. Locations with fewer than 100 inspections are not included in the graph and are referenced in Table 1.

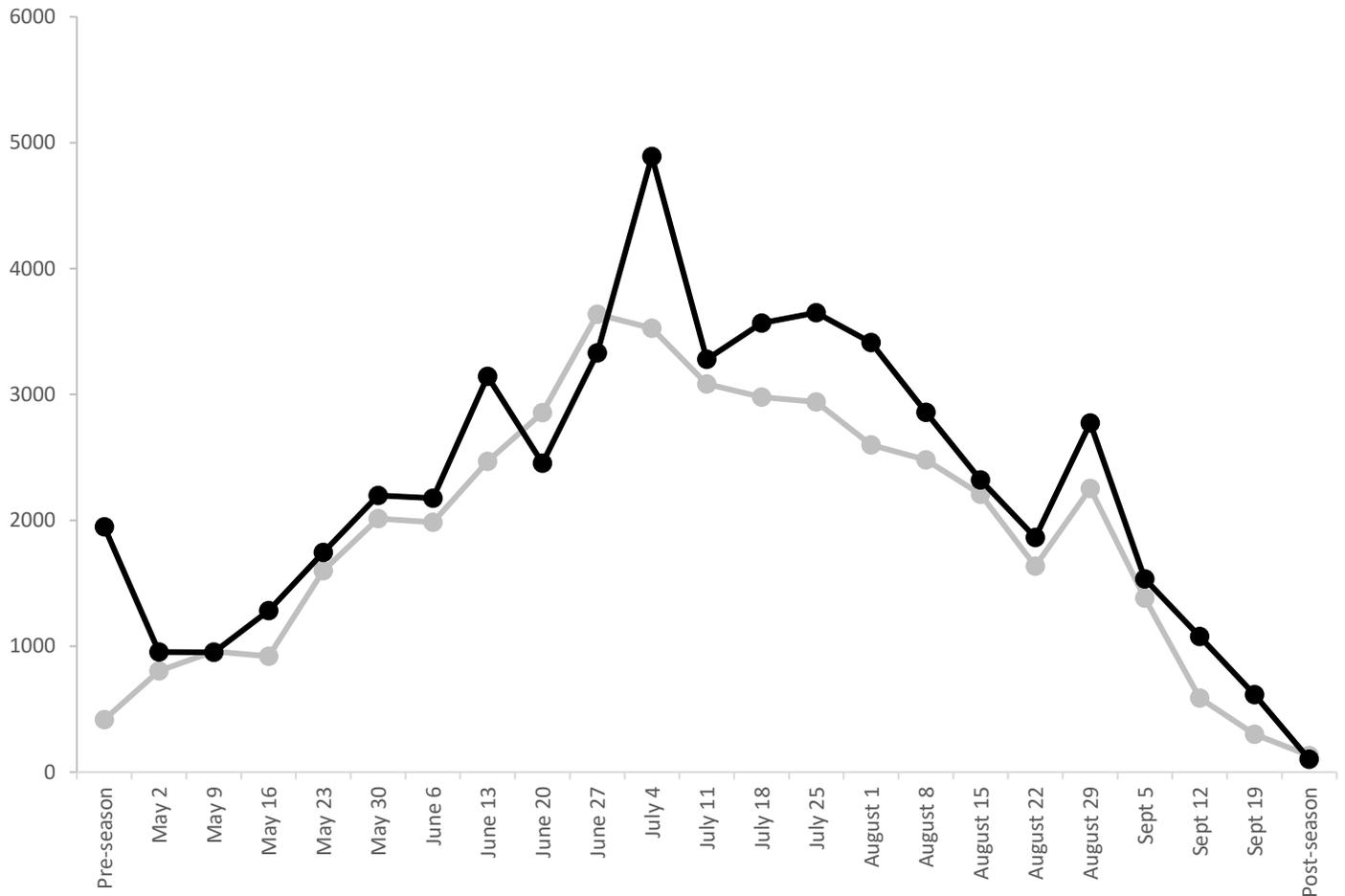


Figure 3. Weekly watercraft inspection totals at all waters during 2019 (black line) and 2010 through 2018 average (gray line), including pre-season (prior to May 2) and post-season (after September 19) inspections.

A total of 3,311 watercraft (6.4% of the total) entered a check station with an intact seal, indicating the watercraft had been previously inspected. All watercraft must display an aquatic invasive species decal prior to launch in Wyoming waters. A total of 18,454 (35.4%) of watercraft next launching in Wyoming did not have a valid AIS decal at the time of inspection. Beginning in 2018, boaters were required to remove bilge plugs after boating and to travel with bilge plugs out during transport in Wyoming. Of watercraft inspected, 77.1% had bilge plugs out upon inspection at check stations.

The majority of watercraft at the inspection station were motorized (67.1%), with lesser non-motorized use (32.9%). The majority of motorized watercraft were outboard (33.6%), followed by inboard/outboard (17.7%), inboard (7.4%), personal watercraft (6.4%), and jet boats (1.9%). Based on registration state of inspected watercraft or trailer, inspection of resident boats (37.4%) was much lower than non-resident boats (62.6%). The majority of nonresident use came from watercraft registered in Utah (26.2%), Colorado (14.7%), Montana (5.1%), Idaho (3.6%), and California (1.3%; Figure 4). Watercraft were registered in 49 states (none were registered in Hawaii), six Canadian provinces (Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan), and in Mexico. Of all registered watercraft through the inspection station, 86.7% were inspected one-time, whereas 13.3% were repeat boaters who had been through an inspection station more than one time during the season. The greatest number of repeat visits was a Wyoming registered watercraft that had been through one check stations (Flaming Gorge) during the season on 32 different days.

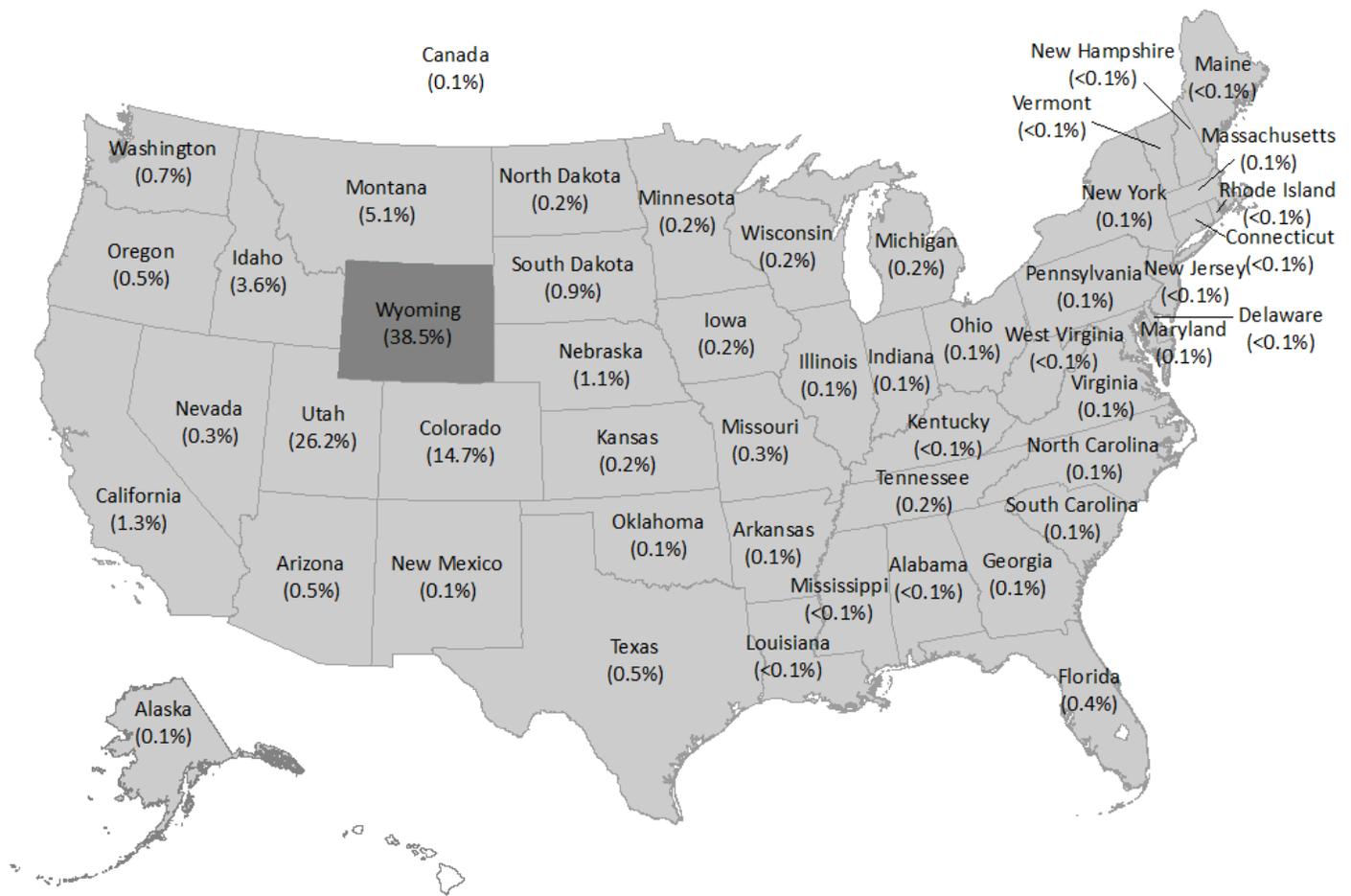


Figure 4. Map indicating registration of watercraft or trailer (state and percent of total) inspected during 2019.

The top ten waters boaters had last been at prior to inspection include Flaming Gorge Reservoir, UT/WY (11.0%), followed by Glendo Reservoir, WY (5.5%); Keyhole Reservoir, WY (4.1%); Bighorn Lake, WY/MT (2.5%); Grayrocks Reservoir, WY (2.3%); Bear Lake, UT/ID (2.2%); Palisades Reservoir, WY/ID (2.0%); Alcova Reservoir, WY (1.8%); Willard Bay Reservoir, UT (1.6%); and Snake River, WY (1.6%). Boaters indicated they had been to 1,825 different waters in 49 states (none last used in Hawaii), 8 Canadian provinces (Alberta, British Columbia, Manitoba, Nova Scotia, Ontario, Quebec, Saskatchewan, Yukon), and Mexico prior to inspection in Wyoming. Of those, Utah, Colorado, Idaho, Montana, and Nebraska received the highest visitation. Overall, 54.9% of watercraft inspected were last used out of state.

Of the last waters visited, 692 are considered suspect or positive for zebra/quagga mussels with the greatest use from Lake Powell, UT/AZ (730 inspections; 1.4% of total watercraft inspected); Lake Havasu, AZ/CA (69 inspections; 0.1%); Canyon Ferry Reservoir, MT (69 inspections; 0.1%); Lake Mead, NV/AZ (65 inspections; 0.1%); and Lake of the Ozarks, MO (28 inspections; <0.1%). A total of 3,410 inspections (6.5% of total) were conducted on watercraft that were last used on a water considered to be positive for zebra or quagga mussels; about one-third (32.8%) of those had been at the positive water within the last month.

When boaters were asked where their destination (next water) was going to be the majority (55.7%) indicated they were planning to launch in Wyoming. The top ten destination waters included Flaming Gorge Reservoir,

WY/UT (19.4%); Glendo Reservoir, WY (5.4%); Bighorn Lake, WY/MT (5.4%); Bear Lake, ID/UT (5.2%); Keyhole Reservoir, WY (5.0%); Grayrocks Reservoir, WY (3.1%); Snake River, WY (3.1%); Green River, WY (1.7%); Palisades Reservoir, ID/WY (1.7%); and Jackson Lake, WY (1.7%). A small percentage of boaters (2.9%) indicated they would be visiting a suspect/positive water next with the majority visiting the States of California, Minnesota, Michigan, Wisconsin and Texas.

## MONITORING

Monitoring was conducted at 384 sites on 89 total waters in 2019 including 70 lakes or reservoirs and 19 streams or rivers (Figure 5). Plankton tows and water quality surveys were conducted at sites to detect larval (veliger) mussels and to document temperature, pH, dissolved oxygen, conductivity, water clarity, calcium and hardness. Shoreline surveys were conducted to detect juvenile and adult mussels, crayfish, clams, snails, and aquatic plants.

Plankton tow samples are sent to the Bureau of Reclamation Lab in Colorado or the Montana Fish, Wildlife and Parks Lab (MTFWP) to be analyzed by cross-polarized light microscopy. If a positive or a suspected positive result occurred from microscopy, the samples are sent to an independent lab for DNA analysis. Specimens detected during shoreline surveys are analyzed by the Colorado Wildlife and Parks Animal Health Lab and plant samples are identified by the MTFWP Aquatic Plant Specialist.

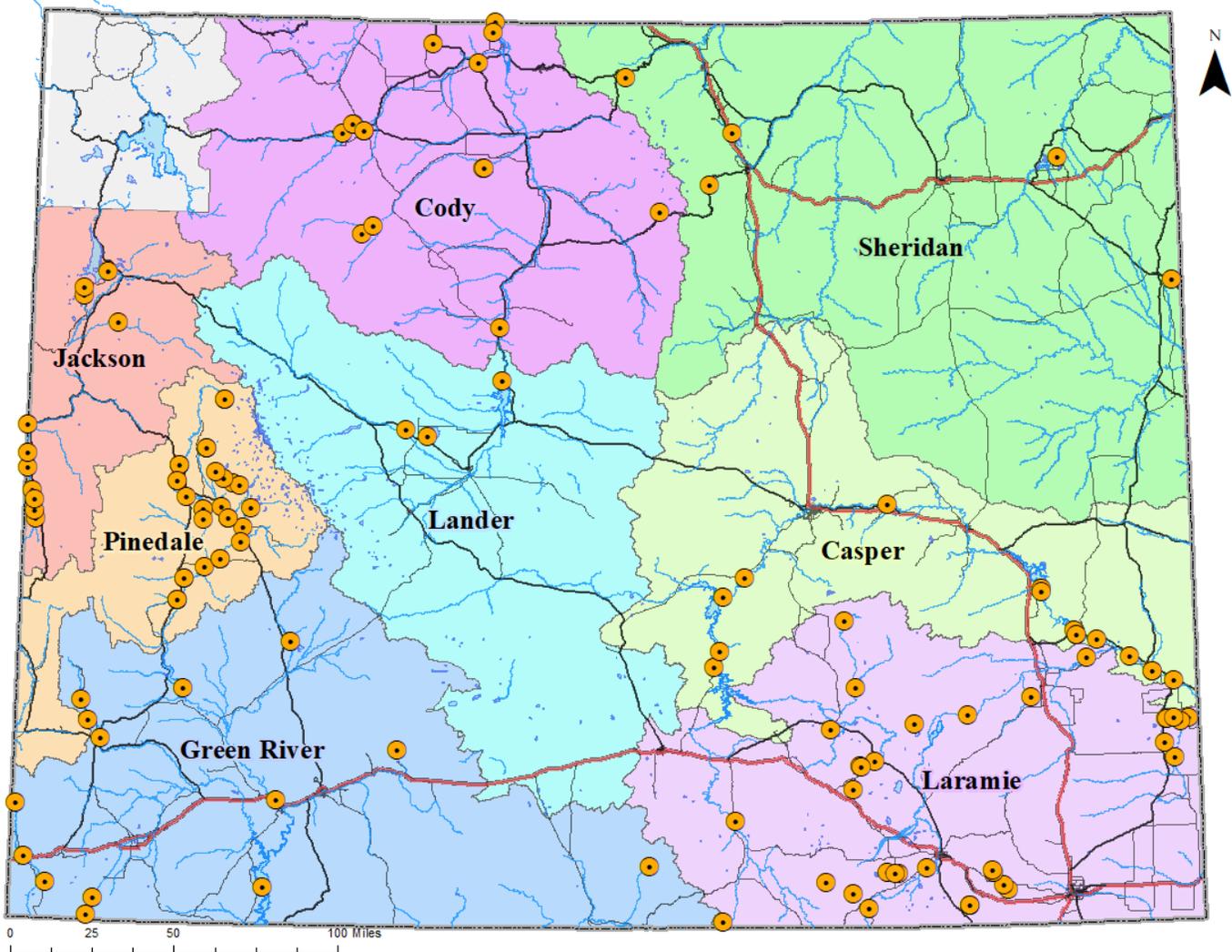


Figure 5. Map of 2019 monitoring locations in each sampling region.

No zebra or quagga mussels were detected by plankton tow monitoring or shoreline surveys in 2019. Current AIS populations in Wyoming include New Zealand mudsnails, Asian clam, rusty crayfish, and curly pondweed. New populations of New Zealand mudsnails were found in the Miracle Mile section of the North Platte River and Curly Pondweed was discovered in Wheatland Reservoir #3 in 2019 (Figure 6).

### **Existing Aquatic Invasive Species in Wyoming**

Sampling of existing populations of invasive species in Wyoming is conducted annually to monitor known populations and determine whether populations have spread.

Asian clams are present in Guernsey Reservoir and the North Platte River downstream, in the Ft. Laramie canal, Keyhole Reservoir, and in Horse Creek.

Brook stickleback are currently widespread throughout Wyoming's warmer water streams. Monitoring historic sites in 2019 found the species where they had been previously documented. A University of Wyoming graduate project began in 2019 to better understand the distribution of brook stickleback in Wyoming and their potential impacts on native nongame fishes.

Curly Pondweed is present in waters dispersed throughout the state including Lake DeSmet and Keyhole Reservoir, Boysen Reservoir, Wheatland Reservoir #3, the Shoshone River, and the North Platte River at the Miracle Mile stretch between Kortez Dam and Pathfinder Reservoir.

New Zealand mudsnails are currently found in Polecat Creek, Salt River, Bighorn River, Shoshone River, Lake Cameahwait, and at Miracle Mile, Cardwell Slough, and Gray Reef portions of the North Platte River.

Rusty crayfish were first found in Wagonhound Creek, a North Platte River tributary, in 2006. Several eradication efforts have been conducted since that time. Sampling in 2019 in lower Wagonhound Creek did not find any evidence of rusty crayfish nor have they have not been documented in the North Platte River near the confluence with the creek.

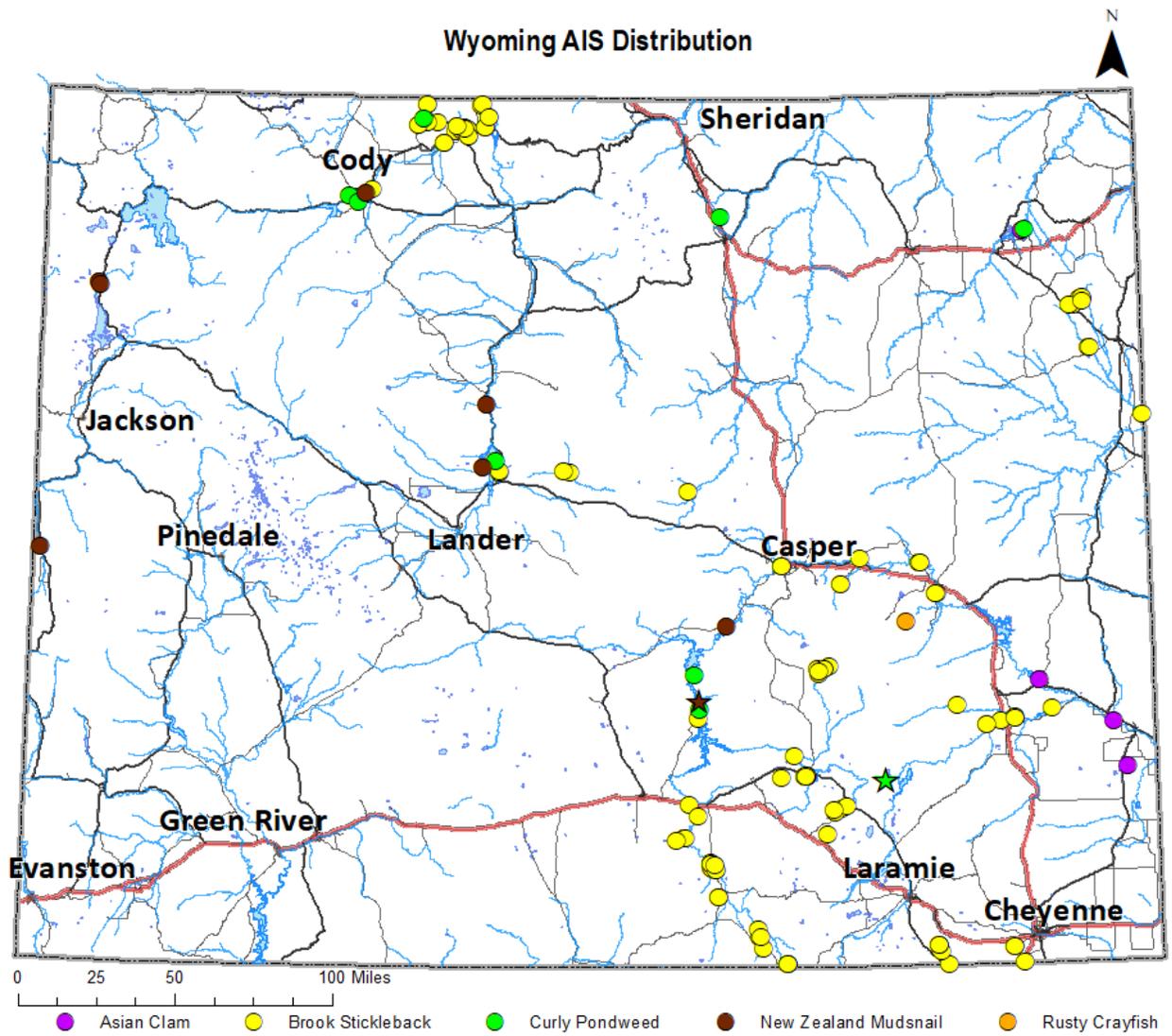


Figure 6. Distribution of aquatic invasive species populations in Wyoming as of 2019. Stars indicate new occurrences in 2019.

## FUNDING

The Wyoming AIS program is funded through Game and Fish license sales, federal grants from partners (U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Forest Service) and from monies generated from the sale of the mandatory AIS decal required of all watercraft before launch. Decal revenues are used to offset the amount of license fee monies used to fund the AIS program. The total AIS program budget for fiscal year 2019 was \$1.22 million.

In 2019, a total of 48,501 decals were sold resulting in receipt of \$682,765 (Table 2). Of the resident motorized decals sold, 5,350 (\$160,500) were three-year decals. From 2018 to 2019, number of decals sold decreased by 134. However, the decreased decals purchased were resident motorized while resident and nonresident non-motorized decal sales increased, resulting in an overall increase in sales of \$535.

Table 2. Type, count, and monies generated from AIS decals sold in 2019 compared to 2018.

Decal type	Count		Sales	
	2018	2019	2018	2019
Resident Motorized	13,953	13,460	\$256,370	\$241,600
Resident Non-motorized	17,120	19,074	\$85,600	\$95,370
Nonresident Motorized	7,113	7,086	\$213,390	\$212,580
Nonresident Non-motorized	8,458	8,881	\$126,870	\$133,215
<b>TOTAL</b>	<b>46,644</b>	<b>48,501</b>	<b>\$682,230</b>	<b>\$682,765</b>