

Wyoming Aquatic Invasive Species 2015 Program Summary



The Wyoming Aquatic Invasive Species (AIS) program continued to focus on outreach, watercraft inspections, and monitoring in 2015.

LEGISLATION

A minor statute change in 2015 allows for the use of an electronic receipt as proof of AIS decal purchase. The subsequent regulation change clarified proof of purchase needed for a decal and also enacted a change to allow decals to be transferred between non-motorized watercraft owned by the same person, provided every watercraft has a decal while on the water.

PERSONNEL

AIS personnel in 2015 included one permanent coordinator, four 12-month AWEC Regional AIS Specialists, four 9-month AWEC Regional AIS Specialists, and 44 seasonal technicians (39 general funded; 3 U.S. Forest Service funded and 2 U.S. Fish and Wildlife Service funded).

OUTREACH AND EDUCATION

Outreach more directly focused on educating the general public about AIS prevention. Ads were displayed on screens prior to shows at movie theaters throughout the state. Ongoing outreach to educate boaters on AIS prevention tips and inspection requirements continued including direct mail to boaters in Wyoming and neighboring states, one-on-one contacts during watercraft inspections, information in watercraft and fishing regulation booklets, and outreach events such as local fairs and celebrations. Outreach also focused on educating school-age children about not releasing pets into the wild with the continuation of the “Don’t Let it Loose” campaign.



TRAINING

A total of 19 watercraft inspection and decontamination trainings were conducted in 10 different locations throughout the state. A total of 496 individuals were certified in 2015, bringing the total number of inspectors since 2010 to over 1,150. Private individuals were again encouraged to become AIS inspectors and to offer services to the boating public as certified inspection locations. Twenty-four (24) locations were authorized as certified inspection locations and many others were certified as private authorized inspectors; 36 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 was implemented in 2015. This 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 2015, 44 FEID inspectors were certified from 21 different field offices.

WATERCRAFT INSPECTIONS

Watercraft check stations were operated from April 25 through September 20 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 47,144 watercraft inspections were conducted over 223 days, resulting in 27,977 individual boaters being contacted at all check stations. A total of 4,055 high risk inspections were conducted and 1,298 watercraft required decontamination (Table 1). The majority of decontaminations (69%) were performed on watercraft with standing water in the motor.

Four 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. Suspect mussel infested watercraft originated from Lake Powell, UT (1), Lake Mead, NV (1), Norris Lake, TN (1), and Maryland (1). These watercraft were destined for Wyoming (2), and Washington (2). Lab analysis of the suspect AIS collected from these watercraft determined two samples (from Lake Mead, NV and Norris Lake, TN) to be zebra/quagga mussels, one sample (from Maryland) to be Conrad's dark false mussels (saltwater mussel related to zebra/quagga mussels), and one sample (from Lake Powell, UT) to not be AIS.

The greatest number of inspections were conducted at the Evanston I-80 check station (8,845), followed by Glendo Reservoir (5,245), Cheyenne I-25 (5,187), Flaming Gorge Reservoir (3,678), and Alpine POE (2,877; Figure 3). The highest inspection activity per hour occurred from 10:00am to 12:00pm and the busiest days of the week were Friday (23%) and Saturday (23%). The highest inspection activity occurred prior to the July 4th holiday (Figure 4). Total hours spent conducting watercraft inspections at all check stations and regional offices was about 34,188 hours, for a statewide average of 1.4 inspections per hour. Inspection rate (inspections/hour) ranged from 0.1 at Willow Lake to 6.9 at the Grand Teton National Park-Moose check station (Table 1).

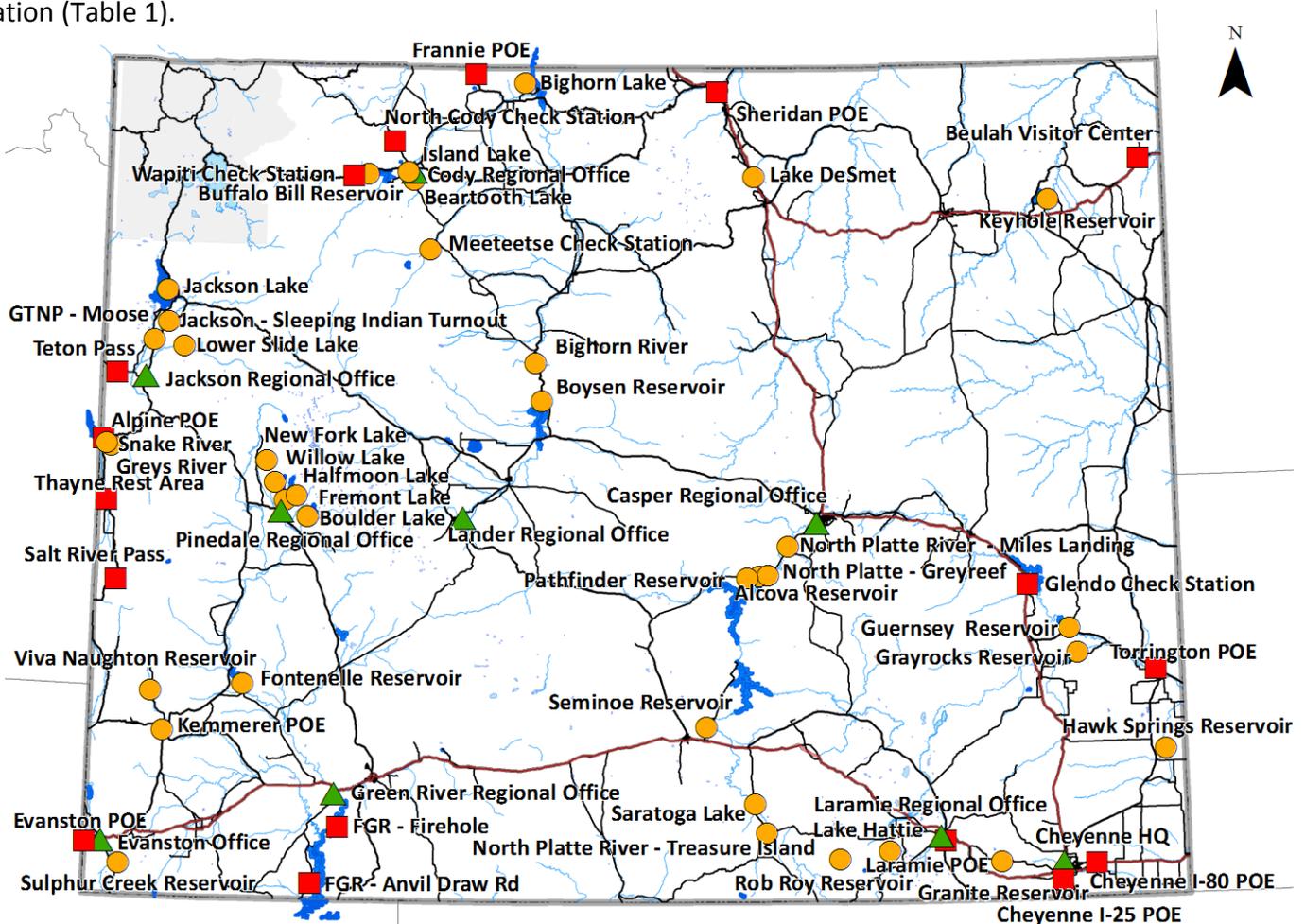


Figure 1. Location of watercraft inspections during 2015 at waters (yellow circle), borders (red square), and regional offices (green triangle).

Table 1. Inspections, decontaminations, inspection hours and inspection rate (inspections per hour) at check stations in 2015.

Check Station	Total Inspections	High Risk Inspections	Decons	Inspection Hours	Inspection Rate
CASPER					
Alcova Reservoir	776	13	7	215	3.6
Glendo Reservoir	5,245	108	27	1,603	3.3
Gray Reef Reservoir	245	12	0	179	1.4
Guernsey Reservoir	144	5	0	86	1.7
North Platte River	10	0	0	27	0.4
Pathfinder Reservoir	661	5	1	207	3.2
Seminole Reservoir	90	0	0	104	0.9
Torrington POE	996	109	37	1,574	0.6
CODY/LANDER					
Beartooth Lakes	39	1	0	63	0.6
Big Horn Lake	1,053	6	0	----	----
Bighorn River	55	2	1	84	0.7
Boysen Reservoir	401	5	1	242	1.7
Buffalo Bill Reservoir	78	1	0	108	0.7
Frannie POE	940	17	4	1,707	0.6
Meeteetse Check Station	89	1	0	58	1.5
North Cody Check Station	461	14	1	520	0.9
Wapiti Check Station	167	5	0	400	0.4
GREEN RIVER					
Evanston POE	8,845	1,246	798	4,672	1.9
Flaming Gorge Reservoir	3,678	53	17	3,533	1.0
Fontenelle Reservoir	375	9	0	420	0.9
Kemmerer	375	23	3	217	1.7
Sulphur Creek Reservoir	108	0	0	128	0.8
Viva Naughton Reservoir	71	2	0	160	0.4
JACKSON/PINEDALE					
Alpine POE	2,877	15	2	1,672	1.7
Boulder Lake	13	0	0	30	0.4
Fremont Lake	186	6	2	159	1.2
Greys River	15	3	0	----	----
GTNP-Moose	900	48	2	130	6.9
Halfmoon Lake	4	0	0	20	0.2
Jackson Lake	108	2	0	70	1.5
Jackson-Sleeping Indian	371	16	1	94	3.9
Lower Slide Lake	29	14	0	20	1.5
New Fork Lake	22	0	0	50	0.4
Salt River Pass	314	13	9	355	0.9
Snake River	933	4	0	236	*3.4
Teton Pass	147	8	0	140	1.1
Thayne Rest Area	763	16	7	518	1.5
Willow Lake	1	0	0	20	0.1

Check Station	Total Inspections	High Risk Inspections	Decons	Inspection Hours	Inspection Rate
LARAMIE/CHEYENNE					
Cheyenne I-25 POE	5,187	549	152	3,342	1.6
Cheyenne I-80 POE	2,425	940	132	2,307	1.1
Granite Reservoir	242	11	0	213	1.1
Grayrocks Reservoir	504	1	0	302	1.7
Hawk Spring Reservoir	79	0	0	100	0.8
Lake Hattie	10	0	0	46	0.2
Laramie POE	1,804	127	21	2,392	0.8
North Platte River	13	0	0	16	0.8
Rob Roy Reservoir	61	2	0	64	1.0
Saratoga Lake	12	0	0	26	0.5
SHERIDAN					
Beulah Visitor Center	883	350	49	2,072	0.4
Keyhole Reservoir	2,658	74	2	1,571	1.7
Lake DeSmet	232	0	0	128	1.8
Sheridan POE	631	30	1	1,610	0.4
Regional Offices	569	114	21	178	3.2
Private Authorized Inspectors**	249	25	0	----	----
TOTAL	47,144	4,055	1,298	34,188	1.4

*Inspections were also conducted by partners and hours were not recorded. Inspection rate was computed for the number of inspections conducted by Wyoming Game and Fish Dept. inspectors.

**Additional inspection records conducted in 2014 by certified locations/private inspectors continue to be received by public inspectors.

A total of 4,138 watercraft (8.8% 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 9,850 (27.7%) of watercraft next launching in Wyoming did not have a valid AIS decal at the time of inspection.

The majority of watercraft at the inspection station were motorized (73.6%), with lesser non-motorized use (26.4%). The majority of motorized watercraft were outboard (35.4%), followed by inboard/outboard (22.4%), personal watercraft (7.6%), inboard (6.1%), and jet boats (2.0%). Based on registration state of inspected watercraft or trailer, inspection of resident boats (39.6%) was much lower than non-resident boats (60.4%). The majority of nonresident use came from watercraft registered in Utah (21.9%), Colorado (17.7%), Idaho (4.1%), Montana (3.9%), and California (1.7%; Figure 5). Watercraft were registered in 49 states (none were registered in Hawaii), 4 Canadian provinces, and France. Of all registered watercraft through the inspection station, 70.5% were inspected one-time, while 29.5% 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 Utah registered watercraft that had been through the Anvil Draw check station at Flaming Gorge Reservoir 30 times during the season on 25 different days.

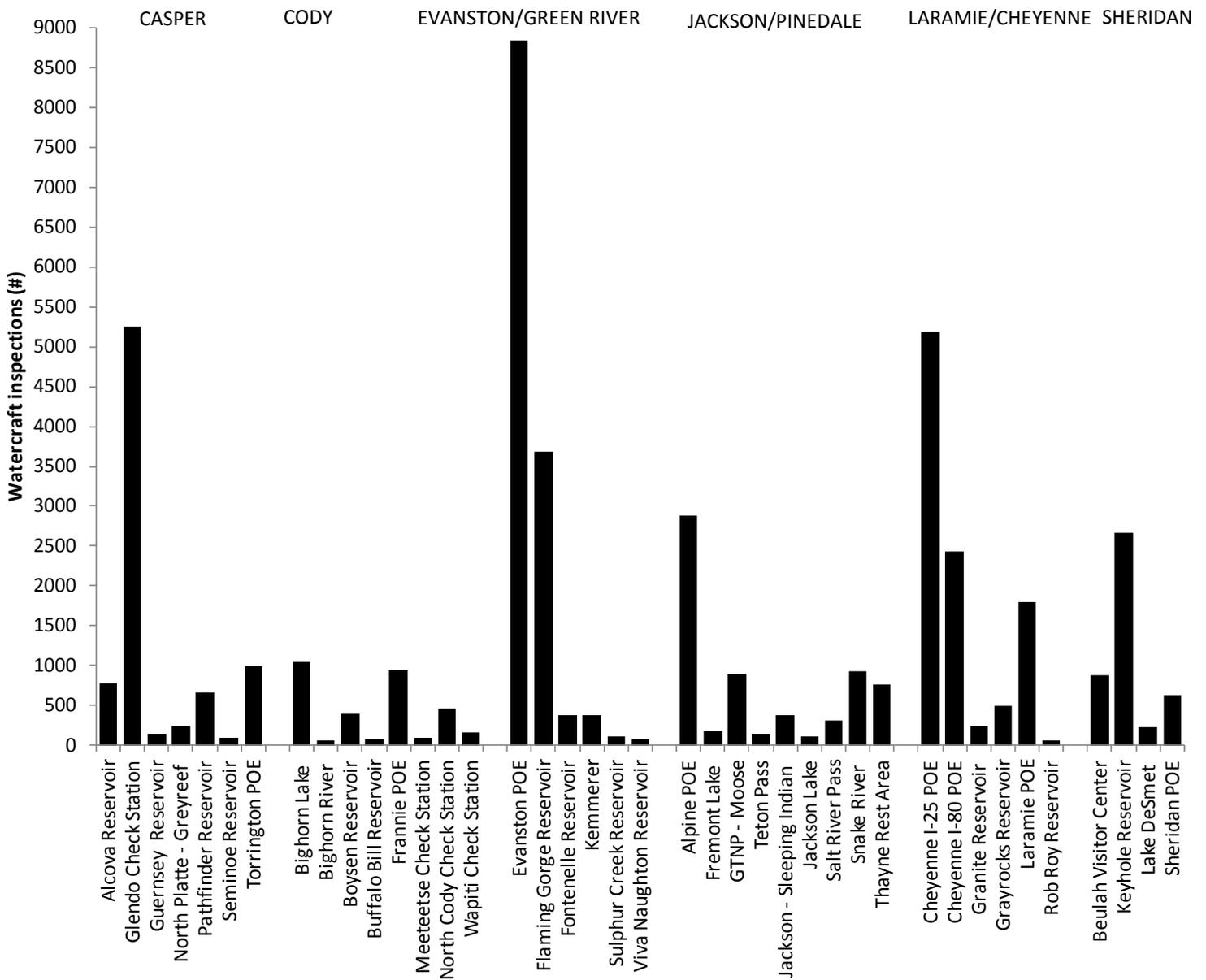


Figure 3. Total watercraft inspections by check station during 2015. Locations with fewer than 50 inspections are not included in the graph and are referenced in Table 3.

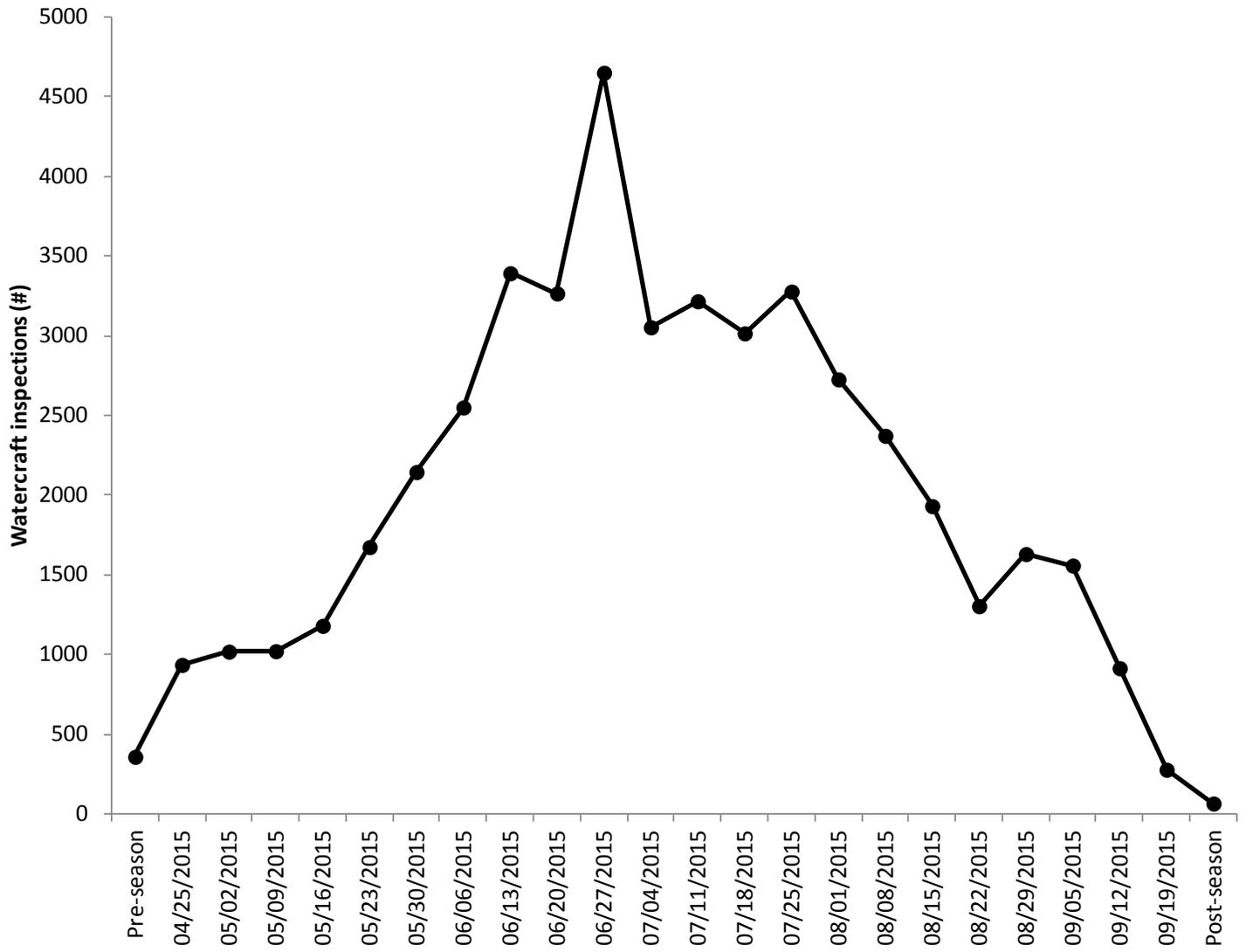


Figure 4. Weekly watercraft inspection totals at all waters during 2015 including pre-season (prior to April 25) and post-season (after September 20) inspections.

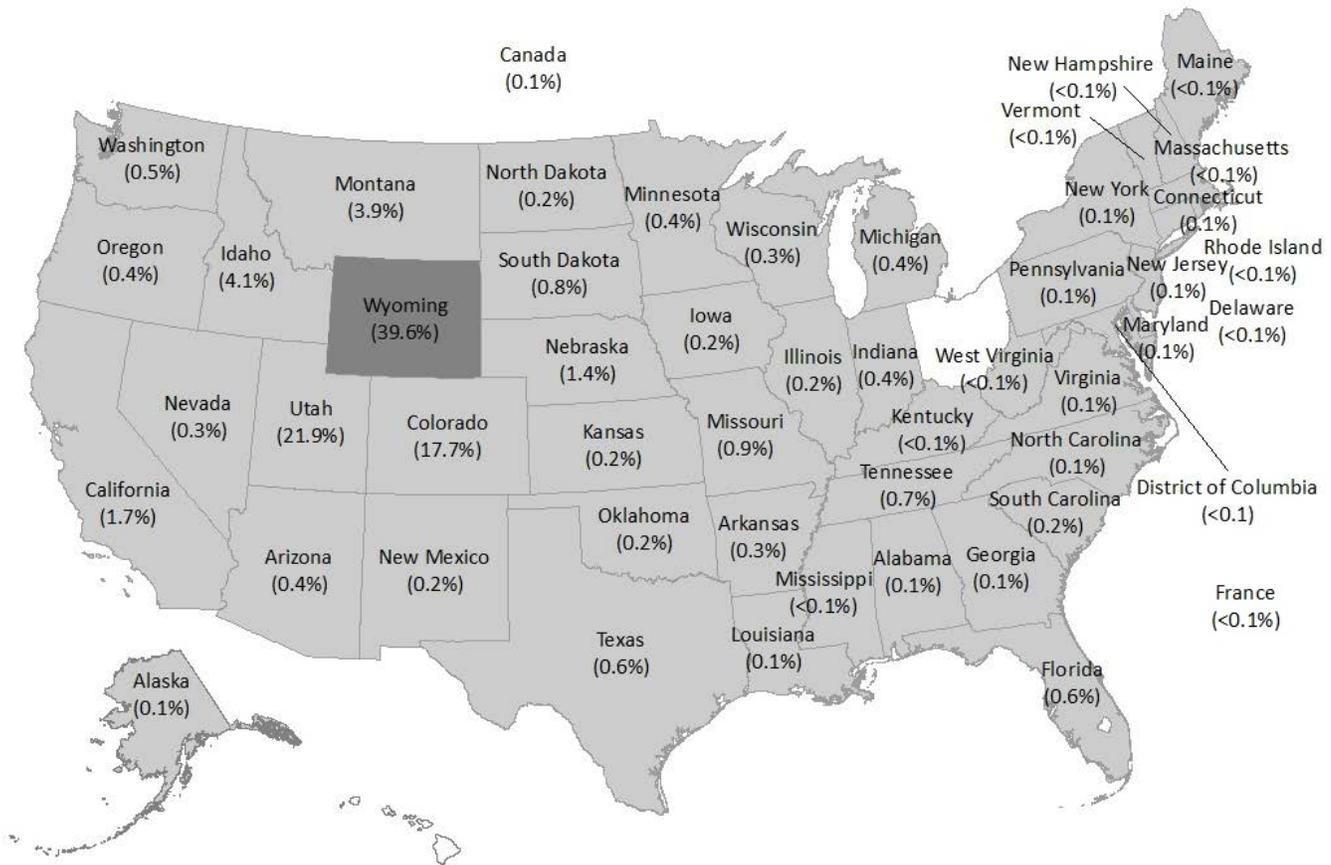


Figure 5. Map indicating registration of watercraft or trailer (state and percent of total) inspected during 2015.

The top ten waters boaters had last been at prior to inspection include Flaming Gorge Reservoir, UT/WY (11.3%), followed by Glendo Reservoir, WY (9.0%); Keyhole Reservoir, WY (6.2%); Snake River, WY/ID (5.9%), Big Horn Lake, WY/MT (2.9%); Grayrocks Reservoir, WY (2.6%); Palisades Reservoir, WY/ID (2.6%); Alcova Reservoir, WY (2.3%); Bear Lake, UT/ID (2.0%); and Horsetooth Reservoir, CO (2.0%). Boaters indicated they had been to 1,618 different waters in 50 states, 4 Canadian provinces, Mexico, and Costa Rica, prior to inspection in Wyoming. Of those, Utah, Colorado, Idaho, Montana, and Nebraska received the highest visitation. Overall, 49.3% of watercraft inspected were last used out of state. Most boats originating from out of state came from waters close to the Wyoming border (Figure 6).

Of the last waters visited, 458 are considered suspect or positive for zebra/quagga mussels with the greatest use from Lake Powell, UT/AZ (501 inspections; 1.2% of total watercraft inspected); Deer Creek Reservoir, UT (337 inspections; 0.8%); Pueblo Reservoir, CO (202 inspections; 0.5%), Lake Havasu CA/AZ (56 inspections; 0.1%), Lake Mead, NV (56 inspections; 0.1%; and Angostura Reservoir, SD (53 inspections; 0.1%; Figure 6). Over 2,124 inspections (4.5% of total) were conducted on watercraft that were last used on a water considered to be positive for zebra or quagga mussels; over half 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 (76.4%) indicated they were planning to launch in Wyoming. The top ten destination waters included Flaming Gorge Reservoir, WY/UT (19.1%); Glendo Reservoir (16.7%); the Snake River, WY/ID (7.0%), Keyhole Reservoir, WY (6.9%); Big Horn Lake, WY (4.5%); Bear Lake, ID/UT (4.3%); Grayrocks Reservoir, WY (3.4%); Jackson Lake (2.8%); Palisades Reservoir, WY/ID (2.4%); and Alcova Reservoir, WY (2.3%). A small percentage of boaters (0.7%) indicated they would be visiting a suspect/positive water next with the majority visiting Lake Powell, AZ/UT or Angostura Reservoir, SD.

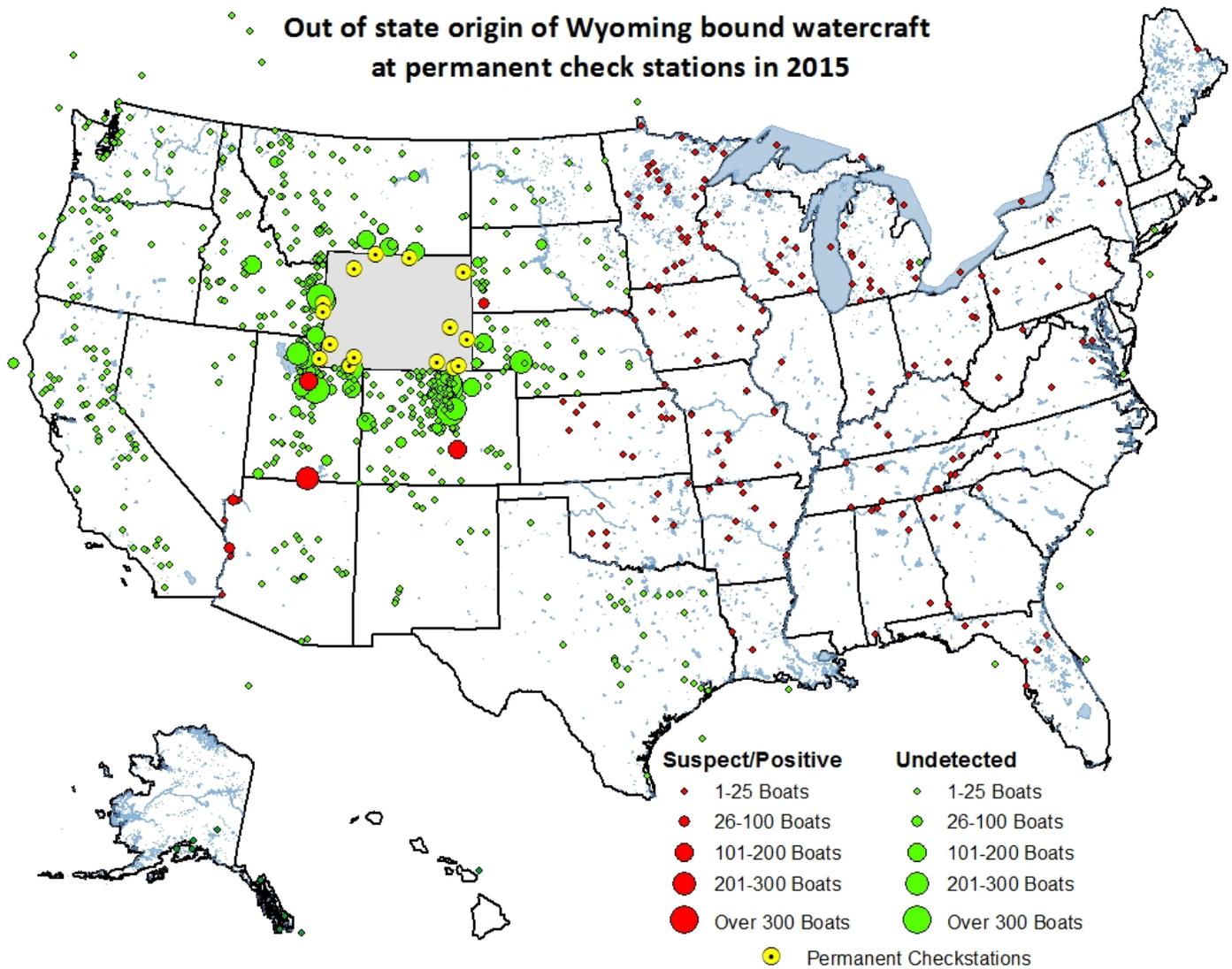


Figure 6. Map indicating origin of watercraft bound for Wyoming that were last used out of state and inspected at a permanent check station during 2015.

MONITORING

Monitoring was conducted on 81 total waters in 2015 including 66 lakes or reservoirs and 15 streams or rivers (Figure 7). Plankton tows and water quality surveys were conducted at 365 sites on 65 waters to detect larval (veliger) mussels and to document temperature, pH, dissolved oxygen, conductivity, water clarity, calcium and hardness. Shoreline surveys were conducted at 156 sites on 78 waters 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.

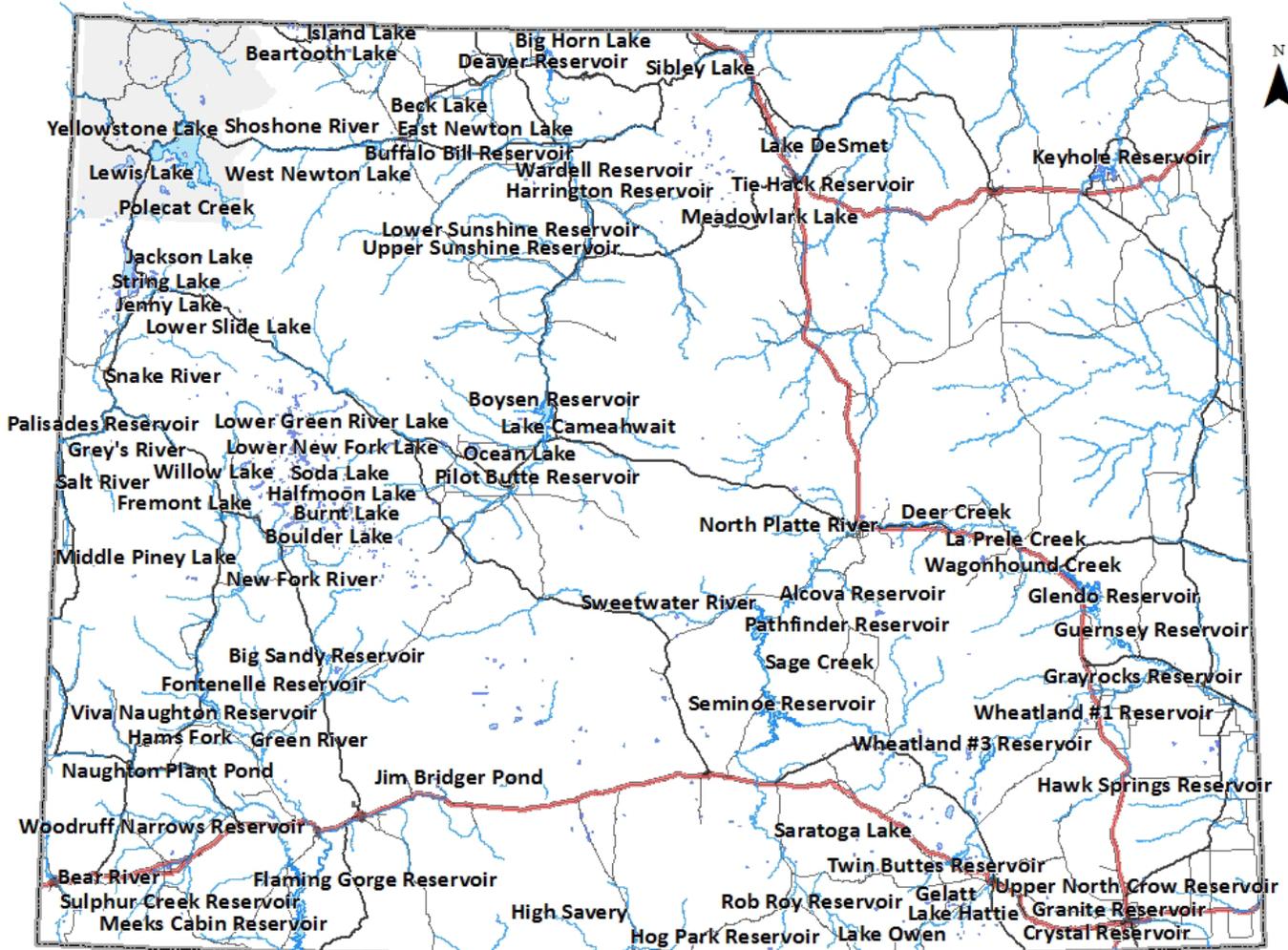


Figure 7. Map of 2015 monitoring locations.

No zebra or quagga mussels were detected by plankton tow monitoring or shoreline surveys in 2015 (Table 2). Current AIS populations in Wyoming include New Zealand mudsnails, Asian clam, rusty crayfish, and curly pondweed (Table 2).

Existing Aquatic Invasive Species in Wyoming

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

Asian clams were first detected in the Laramie River in 2011 (Table 2). Asian clams were found at Tunnel Road, Monolith and Jelm access points to the river (Figure 8). In 2013, surveys found the highest concentration of Asian clam at Monolith, as far away from the access as ½ mile upstream. Additionally, Asian clams were observed at the Tunnel Road Bridge. Asian clams were also detected in the main stem of the North Platte River in 2013, downstream from Guernsey Reservoir. Asian clam shells were found near Optimist Park access point, however, no live clams were found there and the shells were sparsely distributed. No additional populations were detected in 2015.

Brook stickleback are currently widespread throughout Wyoming’s warmer water streams (Figure 8). No additional monitoring was conducted in 2015.

Curly Pondweed was first found in Wyoming in 2011 in Lake DeSmet (Table 2). It was subsequently found in additional waters including Keyhole and Boysen reservoirs. Curly pondweed was also detected in the North

Platte River between Kortez Reservoir and Pathfinder Reservoir, a section of river called the Miracle Mile, and at New Fork Lake at the constriction between upper and lower New Fork Lake. Curly pondweed was detected in the Shoshone River for the first time in 2014 (Figure 8). Preliminary sampling conducted in 2015 indicates curly pondweed may be present in Deaver Reservoir and West Newton Lake. Specimens will be collected in 2016 at these locations to verify this population.

New Zealand mudsnails were first found in the Snake River in 1999 (Table 2). This population still persists, and populations have since been found in Polecat Creek, Bighorn River, Shoshone River, and Lake Cameahwait (Figure 8). A single New Zealand mudsnail was found in the Salt River in 2015. Further sampling will be conducted in 2016 to confirm the presence of a population at this site.

Rusty crayfish were first found in Wagonhound Creek, a North Platte River tributary, in 2006 (Table 2). Several eradication efforts have been conducted since that time. The North Platte River was sampled for crayfish above and below the confluence with Wagonhound Creek in 2014 and no crayfish were detected. Sampling in 2015 near the North Platte River confluence did not find any evidence of rusty crayfish (Figure 8).

Table 2. Status of waters sampled in 2015 and detection year of AIS.

Water	Zebra/Quagga	Other Invasive Species
<i>Lakes and Reservoirs</i>		
Alcova Reservoir	Negative	None
Beartooth Lake	Negative	None
Beck Lake	Negative	None
Big Horn Lake	Negative	None
Big Sandy Reservoir	Negative	None
Boulder Lake	Negative	None
Boysen Reservoir	Negative	Curly pondweed (2013)
Buffalo Bill Reservoir	Negative	None
Burnt Lake	Negative	None
Crystal Reservoir	Negative	None
Deaver Reservoir	Negative	None
East Newton Lake	Negative	None
Flaming Gorge Reservoir	Negative	None
Fontenelle Reservoir	Negative	None
Fremont Lake	Negative	None
Gelatt Lake	Negative	None
Glendo Reservoir	Negative	None
Granite Reservoir	Negative	None
Grayrocks Reservoir	Negative	None
Guernsey Reservoir	Negative	None
Halfmoon Lake	Negative	None
Harrington Reservoir	Negative	None
Hawk Springs Reservoir	Negative	None
High Savery Reservoir	Negative	None
Hog Park Reservoir	Negative	None
Island Lake	Negative	None
Jackson Lake	Negative	None
Jenny Lake	Negative	None
Jim Bridger Pond	Negative	None
Keyhole Reservoir	Negative	Curly pondweed (2013)
Lake Cameahwait	Not Tested	New Zealand mudsnail (2014)
Lake DeSmet	Negative	Curly pondweed (2011)
Lake Hattie	Negative	None
Lake Owen	Negative	None

Water	Zebra/Quagga	Other Invasive Species
<i>Lakes and Reservoirs</i>		
Lewis Lake	Negative	None
Lower Green River Lake	Negative	None
Lower Slide Lake	Negative	None
Lower Sunshine Reservoir	Negative	None
Meadowlark Lake	Negative	None
Meeks Cabin Reservoir	Negative	None
Middle Piney Lake	Negative	None
Naughton Plant Pond	Negative	None
New Fork Lake	Negative	Curly pondweed (2012)
Ocean Lake	Negative	None
Palisades Reservoir	Negative	None
Pathfinder Reservoir	Negative	None
Pilot Butte Reservoir	Negative	None
Rob Roy Reservoir	Negative	None
Saratoga Lake	Negative	None
Seminole Reservoir	Negative	None
Sibley Lake	Negative	None
Soda Lake	Negative	None
String Lake	Negative	None
Sulphur Creek Reservoir	Negative	None
Tie Hack Reservoir	Negative	None
Twin Buttes Reservoir	Negative	None
Upper North Crow	Negative	None
Upper Sunshine Reservoir	Negative	None
Viva Naughton Reservoir	Negative	None
Wardell Reservoir	Negative	None
West Newton Lake	Negative	None
Wheatland Reservoir #1	Negative	None
Wheatland Reservoir #3	Negative	None
Willow Lake	Negative	None
Woodruff Narrows	Negative	None
Yellowstone Lake	Negative	None
<i>Streams and Rivers</i>		
Bear River	Not Tested	None
Bighorn River	Not Tested	New Zealand mudsnail (2012)
Green River	Not Tested	None
Greys River	Not Tested	None
Hams Fork River	Not Tested	None
Hoback River	Not Tested	None
Le Prele Creek	Not Tested	None
Laramie River	Not Tested	Asian clam (2011)
New Fork River	Not Tested	None
North Platte River	Not Tested	Curly pondweed (2012 @ Miracle Mile) Asian clam (2012 @ Downstream Guernsey)
Polecat Creek	Not Tested	New Zealand mudsnail (2001)
Sage Creek	Not Tested	None
Salt River	Not Tested	New Zealand mudsnail (2015)*
Shoshone River	Not Tested	Curly pondweed (2014)
Snake River	Not Tested	New Zealand mudsnail (1999)
Wagonhound Creek	Not Tested	Rusty crayfish (2006)

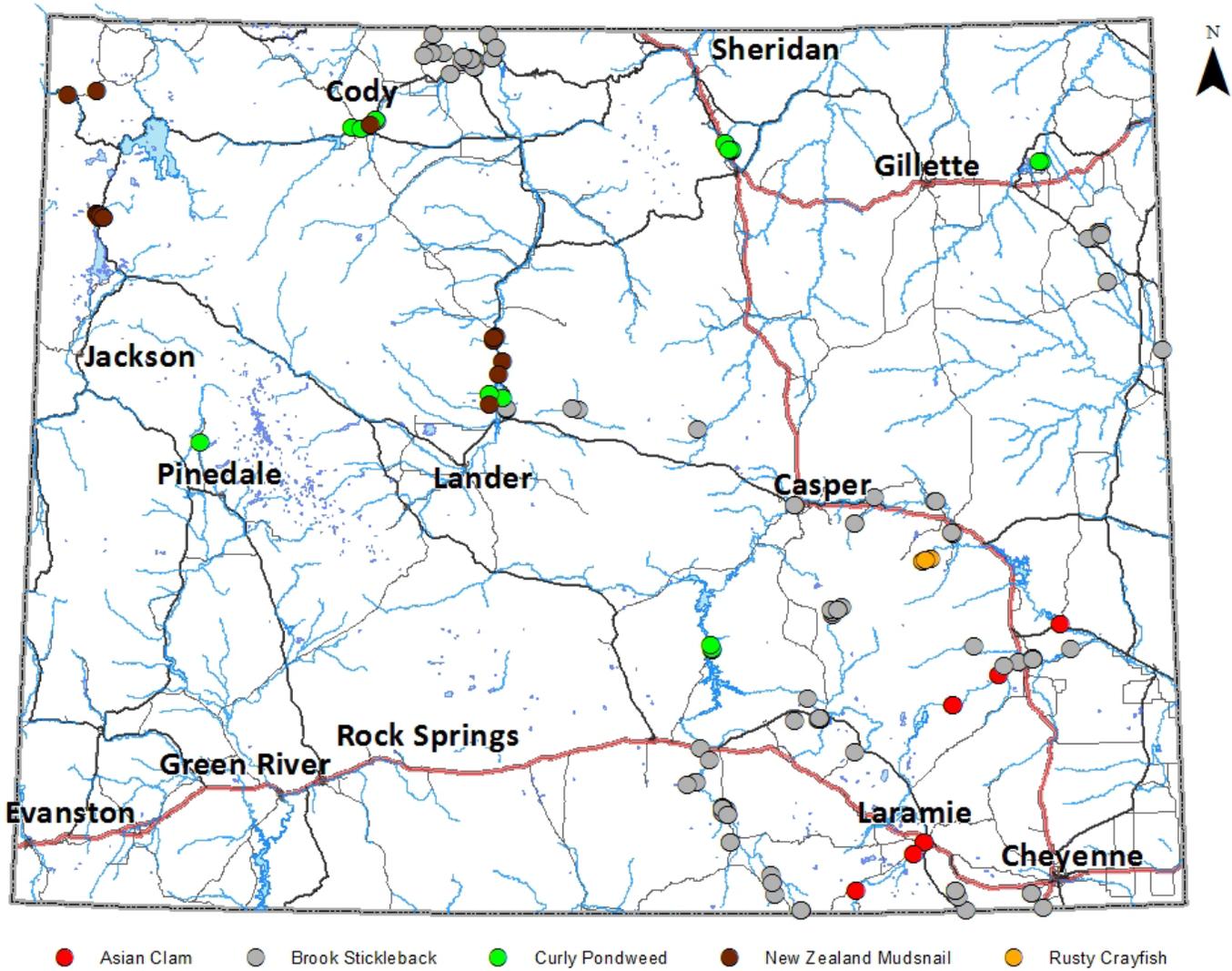


Figure 8. Distribution of aquatic invasive species populations in Wyoming as of 2015.

FUNDING

The Wyoming AIS program is funded through a 2-year legislative appropriation 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 money appropriated by the Wyoming legislature. The total AIS program budget for fiscal years 2015 and 2016 was \$2.6 million.

In 2015, a total of 42,154 decals were sold resulting in receipt of \$669,035 (Table 3). Of the resident motorized decals sold, 6,385 (\$191,550) were three-year decals. Sales of nonresident motorized and non-motorized and resident non-motorized decals increased from 2014 (Table 3).

Table 3. Type, count, and monies generated from AIS decals sold in 2015 compared to 2014.

Decal type	Count		Sales	
	2014	2015	2014	2015
Resident Motorized	20,067	17,409	\$313,350	\$301,790
Resident Non-motorized	9,980	11,424	\$49,900	\$57,120
Nonresident Motorized	6,910	7,354	\$207,300	\$220,620
Nonresident Non-motorized	5,303	5,967	\$79,545	\$89,505
TOTAL	42,260	42,154	\$650,095	\$669,035