

# Wyoming Aquatic Invasive Species 2020 Program Summary



## PERSONNEL

AIS personnel in 2020 included one permanent coordinator, three permanent Regional AIS Specialists, three 12-month AWEC Regional AIS Specialists, two 9-month AWEC Regional AIS Specialists, and 46 seasonal technicians (32 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 limited to virtual opportunities after COVID-19 restrictions were implemented in March 2020, which limited overall reach compared to most years. Statewide outreach events included the boater appreciation raffle, virtual Outdoor Expo involvement, and the Denver, CO; Lincoln, NE; Rapid City, SD and Utah boat shows.

In 2020, 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 on 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 699 entries in the raffle survey; of those 244 unique individuals entered the raffle. Although fewer people entered the raffle than in previous years (1,540 individuals in 2019), the responses were very similar regarding satisfaction with inspections.

The overall experience by boaters at watercraft check stations was positive with 95.1% indicating they were either very satisfied (81.5%) or satisfied (13.6%). Satisfaction with the timeliness of inspections was also high, with 95.3% of boaters very satisfied (82.4%) or satisfied (12.9%) with the amount of time required for inspection. The majority of respondents (62.7%) waited less than 5 minutes for an inspection with six responses indicating a wait time over 30 minutes. Lastly, boaters rated the professionalism of inspectors high with 96.9% of boaters very satisfied (83.5%) or satisfied (13.4%). The majority of boaters (87.4%) responding to the survey had purchased a 2020 AIS decal at the time of inspection. Raffle respondents were mostly Wyoming residents (58.0%), followed by residents of Utah (23.3%), Colorado (9.6%), Montana (6.4%), and Nebraska (1.4%). Boaters who responded to the raffle survey were from 7 different states.

## TRAINING

A total of 11 watercraft inspection and decontamination trainings were conducted in 8 different locations throughout the state. In total, 69 individuals were certified at a course, bringing the total number of inspectors since 2010 to over 1,800. Private certifications were canceled due to COVID-19 and inspectors were allowed to recertify online for another year, regardless of whether they were due for an in-person training in 2020. Two private certifications were hosted virtually in the summer to train new employees at certified inspection locations (West Laramie Fly Store and Seedskaadee National Wildlife Refuge).

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 2020, 68 FEID inspectors were certified via online training from 15 different field offices.

## WATERCRAFT INSPECTIONS

Watercraft check stations were operated from April 18 through September 13 at fourteen permanent check stations at port of entry (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 75,620 watercraft inspections (45% increase from 2019) were conducted over 240 days, resulting in 52,918 individual boaters being contacted at all check stations. A total of 4,510 high risk inspections (6% increase) were conducted and 701 watercraft required decontamination (33% increase; Table 1).

Twenty-two 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, Utah/AZ (13 watercraft); Lake Michigan, IL/WI (2); Unknown (2); Colorado River, AZ (1); Lake Mead, NV (1); Lake Ontario, Canada (1); Lake Winnebago, WI (1); and Mille Lacs, MN (1). These watercraft were destined for Flaming Gorge Reservoir, Utah/WY (7 watercraft); Unknown Next Destination (5); Bear Lake Utah/Idaho (2); Pacific Ocean (2); Alcova Reservoir, WY (1); Boysen Reservoir, WY (1); Fontenelle Reservoir, WY (1); Jackson Lake, WY (1); Palisades Reservoir, WY (1); and the Province of Vancouver (1). Two watercraft (including one kayak) were intercepted with suspected Asian clams aboard. These watercraft originated from Lake Havasu, AZ and an unspecified water or state, and were destined for Horsetooth Reservoir, CO and an unspecified water or state. One watercraft was intercepted with suspected New Zealand mudsnails aboard. This watercraft originated from and was destined for Flaming Gorge Reservoir, Utah.

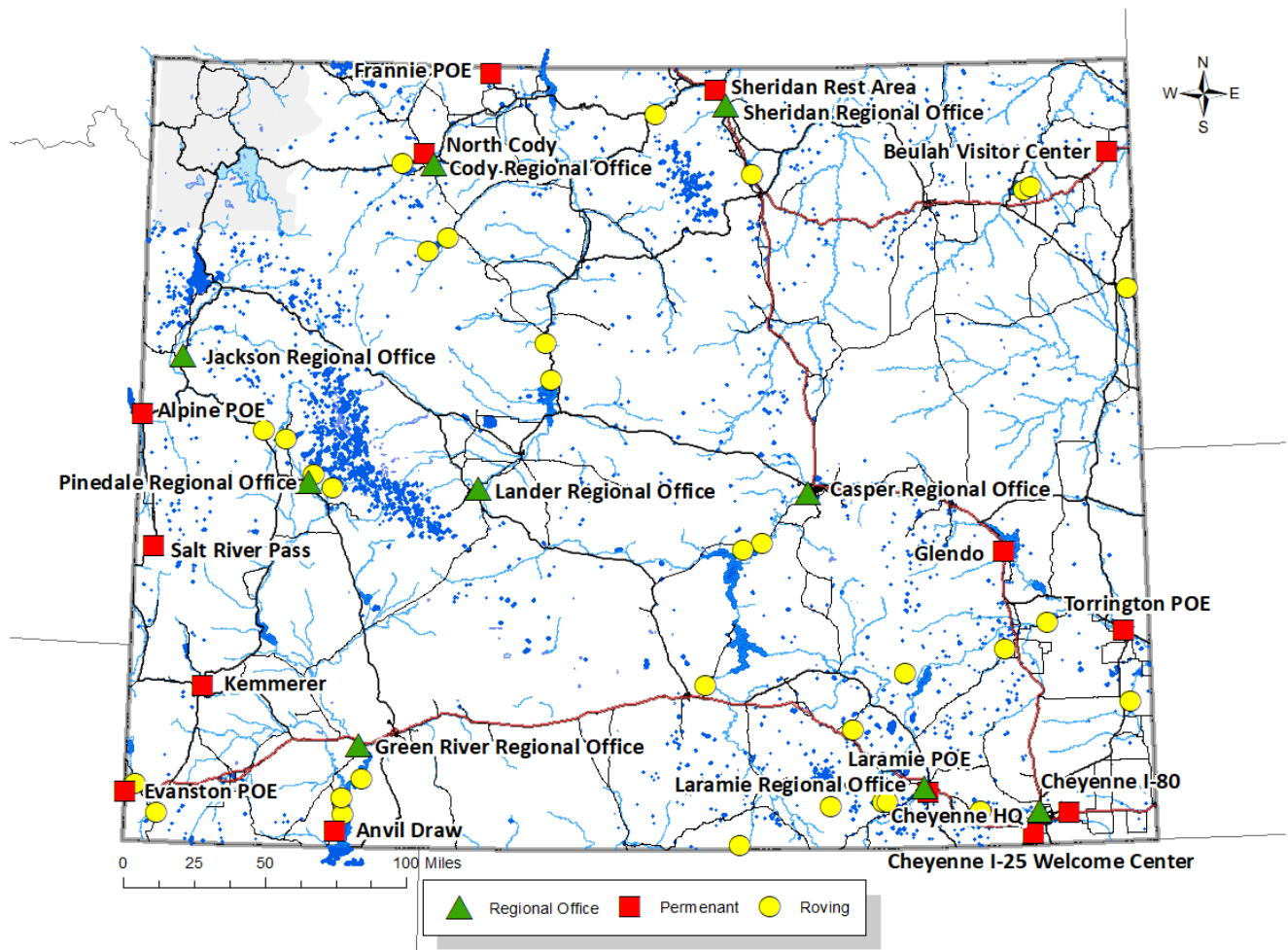


Figure 1. Location of watercraft inspections conducted during 2020 at waters (yellow circle), borders (red

square), and regional offices (green triangle).

The greatest number of inspections were conducted at the Evanston I-80 check station (19,927; 47% increase from 2019), followed by Glendo Reservoir (7,925; 110% increase from 2019), Alpine POE (5,468; 42% increase from 2019), Cheyenne I-25 POE (4,954; 15% increase from 2019), Keyhole Reservoir (4,130; 78% increase from 2019), and Laramie 287 POE (4,004; 41% increase from 2019; Figure 2). The highest inspection activity per hour occurred from 11:00am to 1:00pm and the busiest days of the week were Friday (23%) and Saturday (22%). The highest inspection activity occurred during the week leading up to the July 4<sup>th</sup> holiday (Figure 3). Total hours spent staffing watercraft inspections at all check stations and regional offices was about 37,255 hours, for a statewide average of 2.0 inspections per hour. Inspection rate (inspections/hour) ranged from 0.1 at Saratoga Lake and Twin Buttes Reservoir to 4.6 at Glendo 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 2020.

Check Station	Total Inspections	Percent Sealed	High Risk Inspections	Percent High Risk	Decons	Inspection Hours	Inspection Frequency
<i>Casper</i>							
Alcova Res.	1,006	1.3%	4	0.4%	1	293	3.4
Casper Office	189	5.3%	61	32.3%	12	177	1.1
Glendo Res.	7,925	5.0%	109	1.4%	15	1,728	4.6
North Platte River	499	4.9%	3	0.6%	1	317	1.6
Pathfinder Res.	602	1.8%	0	0%	0	170	3.5
Seminole Res.	216	8.3%	2	0.9%	0	125	1.7
Torrington POE	1,256	9.6%	86	6.8%	6	1,711	0.7
<i>Cody/Lander</i>							
Bighorn Lake	3,102	0.3%	1	0%	1	----	----
Bighorn River	46	0%	0	0%	0	32	1.4
Boysen Res.	175	0%	1	0.6%	0	105	1.7
Buffalo Bill Res.	261	1.5%	14	5.4%	0	182	1.4
Bull Lake	1	0%	0	0%	0	----	----
Cody Office	12	0%	1	8.3%	0	----	----
Frannie POE	2,170	3.0%	24	1.1%	0	1,480	1.5
Lander Office	16						
Meeteetse	129	5.4%	1	0.8%	0	154	0.8
North Cody	393	5.1%	14	3.6%	0	790	0.5
Sunshine Res.	7	0%	0	0%	0	10	1.0
<i>Green River</i>							
Anvil Draw	3,970	4.2%	32	0.8%	6	2,746	1.4
Evanston POE	19,927	0.7%	2,139	10.7%	413	8,012	2.5
Flaming Gorge	2,047	1.2%	5	0.2%	1	1,176	1.7
Green River Office	63	12.7%	6	9.5%	2	----	----
High Savery Res.	6	0%	0	0%	0	----	----
Kemmerer	1,243	24.9%	11	0.9%	1	944	1.3
Sulphur Creek Res.	36	0%	3	8.3%	0	----	----

Check Station	Total Inspections	Percent Sealed	High Risk Inspections	Percent High Risk	Decons	Inspection Hours	Inspection Frequency
<i>Jackson/Pinedale</i>							
Alpine POE	5,468	1.2%	92	1.7%	5	1,605	3.4
Boulder Lake	7	0%	0	0%	0	30	0.2
Cora Hwy 352	398	0%	2	0.5%	0	209	1.9
Fremont Lake	916	0.9%	4	0.4%	0	312	2.9
Hoback Rim 191	140	4.3%	0	0%	0	47	3.0
Jackson Office	67	1.5%	6	9.0%	2	----	----
Pinedale Office	72	0%	9	12.5%	0	----	----
Salt River Pass	1,017	45.8%	60	5.9%	1	549	1.9
<i>Laramie/Cheyenne</i>							
Cheyenne HQ	69	0%	1	1.5%	0	----	----
Cheyenne I-25	4,954	13.8%	395	8.0%	65	3,307	1.5
Cheyenne I-80	2,037	1.2%	506	24.8%	74	2,539	1.1
Diamond Lake	22	4.5%	0	0%	0	10	1.5
Granite Res.	232	2.9%	2	0.9%	0	104	2.2
Grayrocks Res.	506	4.0%	4	0.8%	0	114	4.4
Hawk Springs Res.	178	5.6%	1	0.6%	1	80	2.2
Lake Hattie	5	0%	0	0%	0	10	0.5
Lake Owen	11	0%	0	0%	0	----	----
Laramie 287 POE	4,004	8.7%	344	8.6%	22	2,599	1.5
Laramie Office	30	0%	3	10.7%	0	----	----
North Platte River	2	0%	0	0%	0	----	----
Rob Roy Res.	61	0%	5	8.2%	0	52	1.2
Saratoga Lake	2	0%	0	0%	0	20	0.1
Twin Buttes Res.	5	0%	1	20%	0	62	0.1
Wheatland #1 Res.	29	0%	1	3.4%	0	----	----
<i>Sheridan</i>							
Beulah	1,800	0.6%	341	18.9%	56	1,812	1.0
Keyhole Res.	4,130	0.3%	33	0.8%	5	1,570	2.6
Lake DeSmet	499	0.8%	3	0.6%	0	240	2.1
Sheridan Office	5	0%	4	80%	0	----	----
Sheridan Rest Area	3,629	3.3%	179	4.8%	11	1,832	2.0
<b>Total/Average</b>	<b>75,592</b>	<b>4.1%</b>	<b>4,513</b>	<b>6.0%</b>	<b>701</b>	<b>37,255</b>	<b>2.0</b>

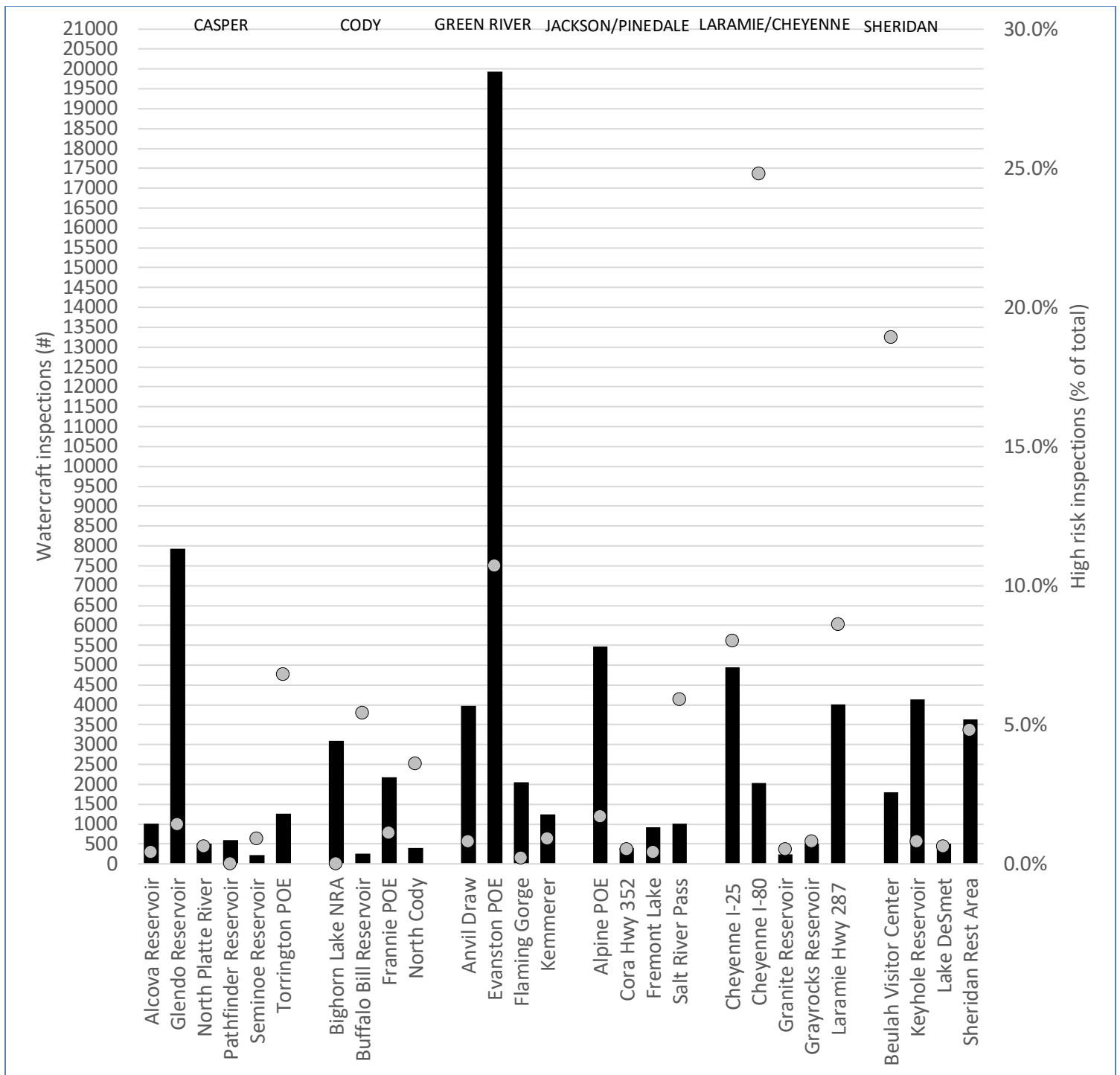


Figure 2. Total watercraft inspections (black bar) and high risk inspections as a percent of the total (gray circle) by check station during 2020. Locations with fewer than 200 inspections are not included in the graph and are referenced in Table 1.

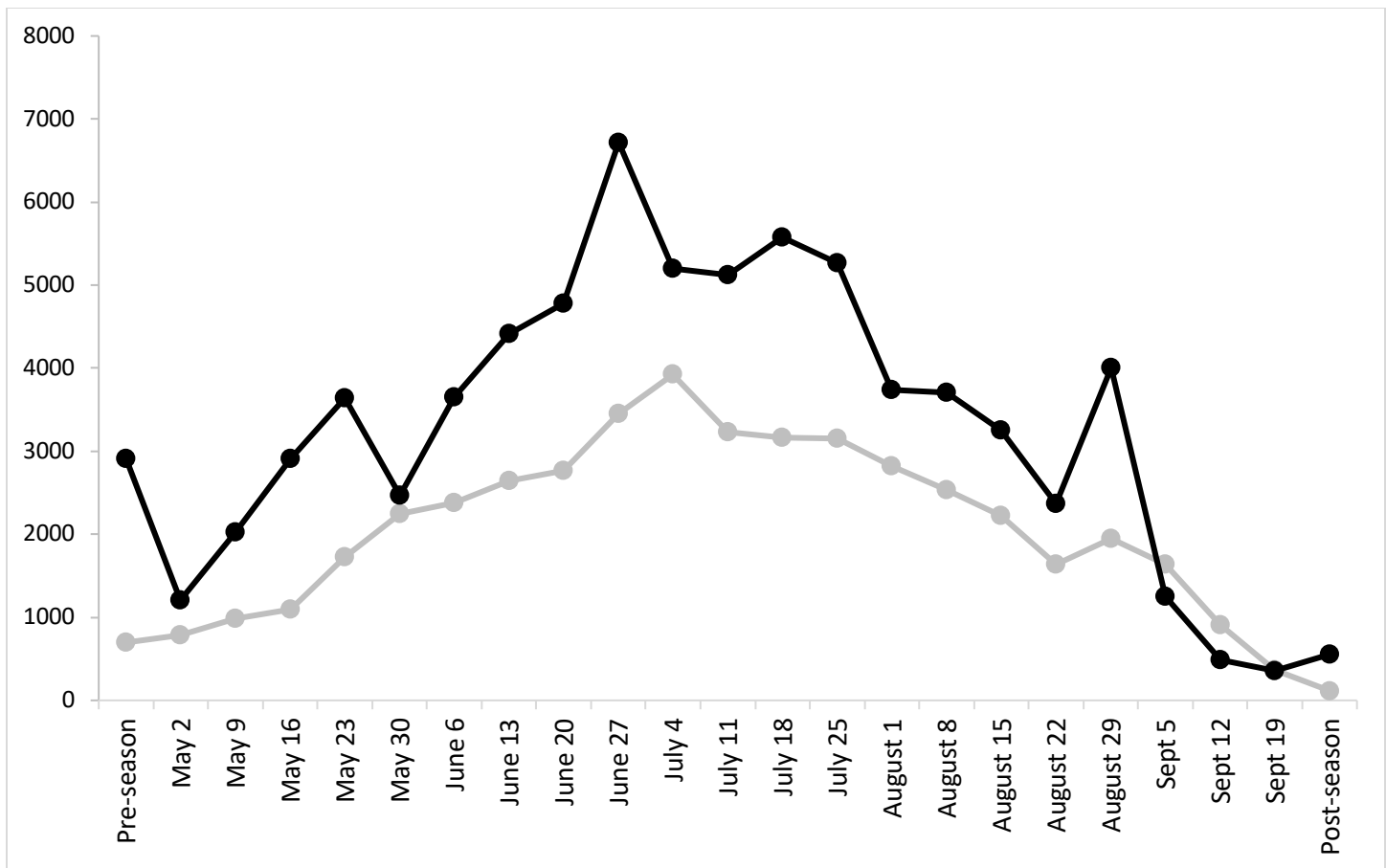


Figure 3. Weekly watercraft inspection totals at all waters during 2020 (black line) and 2010 through 2019 average (gray line), including pre-season (prior to May 2) and post-season (after September 19) inspections.

The overall increase of inspections in 2020 can likely be attributed to the COVID-19 pandemic and was something other western states noted, too (Figure 5). However, some of this increase may be due to better compliance of boaters stopping at AIS check stations.

A total of 3,124 watercraft (4.1% 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 20,449 (33.4%; 1 % decrease from 2019) watercraft that would be launched next 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, 79.4% (2% increase from 2019) had bilge plugs out upon inspection at check stations.

The majority of watercraft at the inspection station were motorized (62.0%). The majority of motorized watercraft were outboard (29.6%), followed by inboard/outboard (16.7%), inboard (7.6%), personal watercraft (6.2%), and jet boats (2.0%). Based on registration state of inspected watercraft or trailer, most inspections were conducted on non-resident boats (60.9%). The majority of nonresident use came from watercraft registered in Utah (27.3%), Colorado (14.3%), Montana (5.6%), Idaho (3.4%), and California (1.2%; Figure 4). Based on registrations, watercraft entered Wyoming from all 50 states, two US territories (Northern Mariana Islands and American Samoa), five Canadian provinces (Alberta, British Columbia, Manitoba, Ontario, and Saskatchewan), and Mexico. Of all registered watercraft that visited an inspection station, 75.0% were inspected one-time, whereas 25.0% 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 (Firehole) during the season on 27 different days.

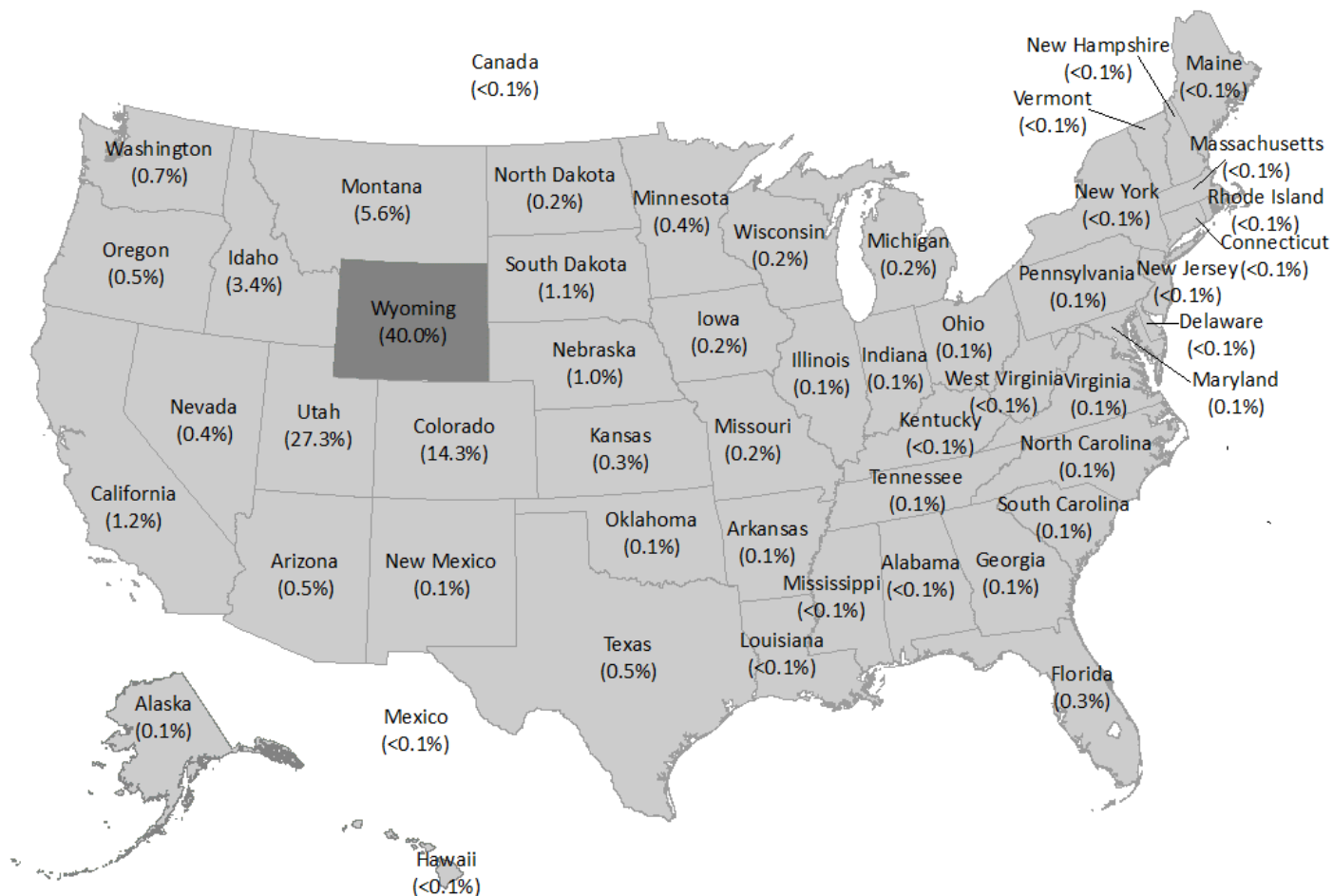


Figure 4. Map indicating registration of watercraft or trailer (state and percent of total) inspected during 2020.

The top ten waters boaters had last been at prior to inspection include Flaming Gorge Reservoir, Utah/WY (10.0%), followed by Glendo Reservoir, WY (6.7%); Keyhole Reservoir, WY (5.0%); Palisades Reservoir, WY/ID (2.3%); Bighorn Lake, WY/MT (2.2%); Bear Lake, Utah/Idaho (1.7%); Alcova Reservoir, WY (1.6%); Grayrocks Reservoir, WY (1.5%); Snake River, WY (1.5%) and Lake DeSmet, WY (1.4%). Boaters indicated they had been to 2,108 different waters in 49 states (none last used in Hawaii), 7 Canadian provinces (Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan, and Yukon), and Mexico prior to inspection in Wyoming. Of those, Utah, Colorado, Idaho, Montana, and South Dakota received the highest visitation. Overall, 55.4% of watercraft inspected were last used out of state.

Of the last waters visited, 732 are considered suspect or positive for zebra/quagga mussels with the greatest use from Lake Powell, Utah/AZ (857 inspections; 1.1% of total watercraft inspected); Colorado River, AZ/CA/NV (57 inspections; <0.1%); Lake Mead, AZ/NV (46 inspections; <0.1%); Lake Havasu, AZ/CA (46 inspections; <0.1%); and Lake of the Ozarks, MO (41 inspections; <0.1%). A total of 4,790 inspections (6.3% of total) were conducted on watercraft that were last used on a water considered to be positive for zebra or quagga mussels; just less than half (42.5%) of those had been at the positive water within the last 30 days.

When boaters were asked about their destination (next water), the majority (63.5%) indicated they were planning to launch in Wyoming. The top ten destination waters included Flaming Gorge Reservoir, WY/Utah (18.3%); Glendo Reservoir, WY (12.8%); Keyhole Reservoir, WY (6.3%); Bear Lake, Idaho/Utah (4.3%); Bighorn



Lake, WY/MT (4.2%); Snake River, WY (2.9%); Palisades Reservoir, Idaho/WY (2.3%); Grayrocks Reservoir, WY (1.9%); Green River, WY (1.7%); and Alcova Reservoir, WY (1.6%). A small percentage of boaters (2.3%) indicated they would be visiting 312 unique suspect/positive waters next with the majority visiting the states of California, Wisconsin, Minnesota, Florida and Texas.

## MONITORING

Monitoring was conducted at 376 sites on 76 total waters in 2020 including 68 lakes or reservoirs and 8 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.

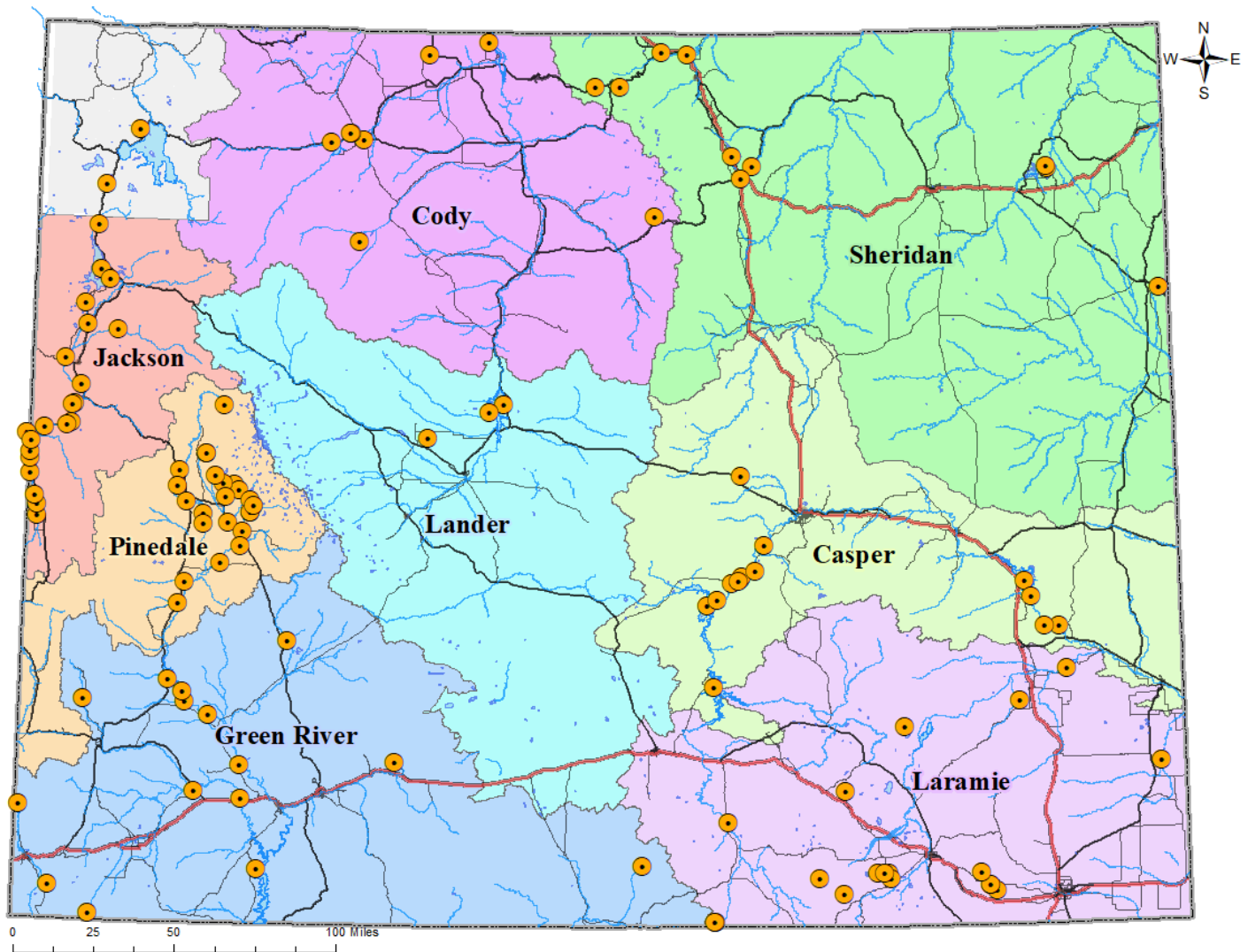


Figure 5. Map of 2020 monitoring locations in each sampling region.

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 were sent to an independent lab for DNA analysis. Specimens detected during shoreline surveys were analyzed by the Colorado Wildlife and Parks Animal Health Lab and plant samples were identified by the MTFWP Aquatic Plant Specialist.

No zebra or quagga mussels were detected by plankton tow monitoring or shoreline surveys in 2020. Current

AIS populations in Wyoming include New Zealand mudsnail, Asian clam, rusty crayfish, brook stickleback and curly pondweed (Figure 6). New populations of rusty crayfish were found in the Laramie River, Bluegrass Creek (tributary to Laramie River) and some private ponds within the Laramie Mountain Range. A new population of New Zealand mudsnail was found on the Salt River (Jackson region) at the Bateman's boat launch.

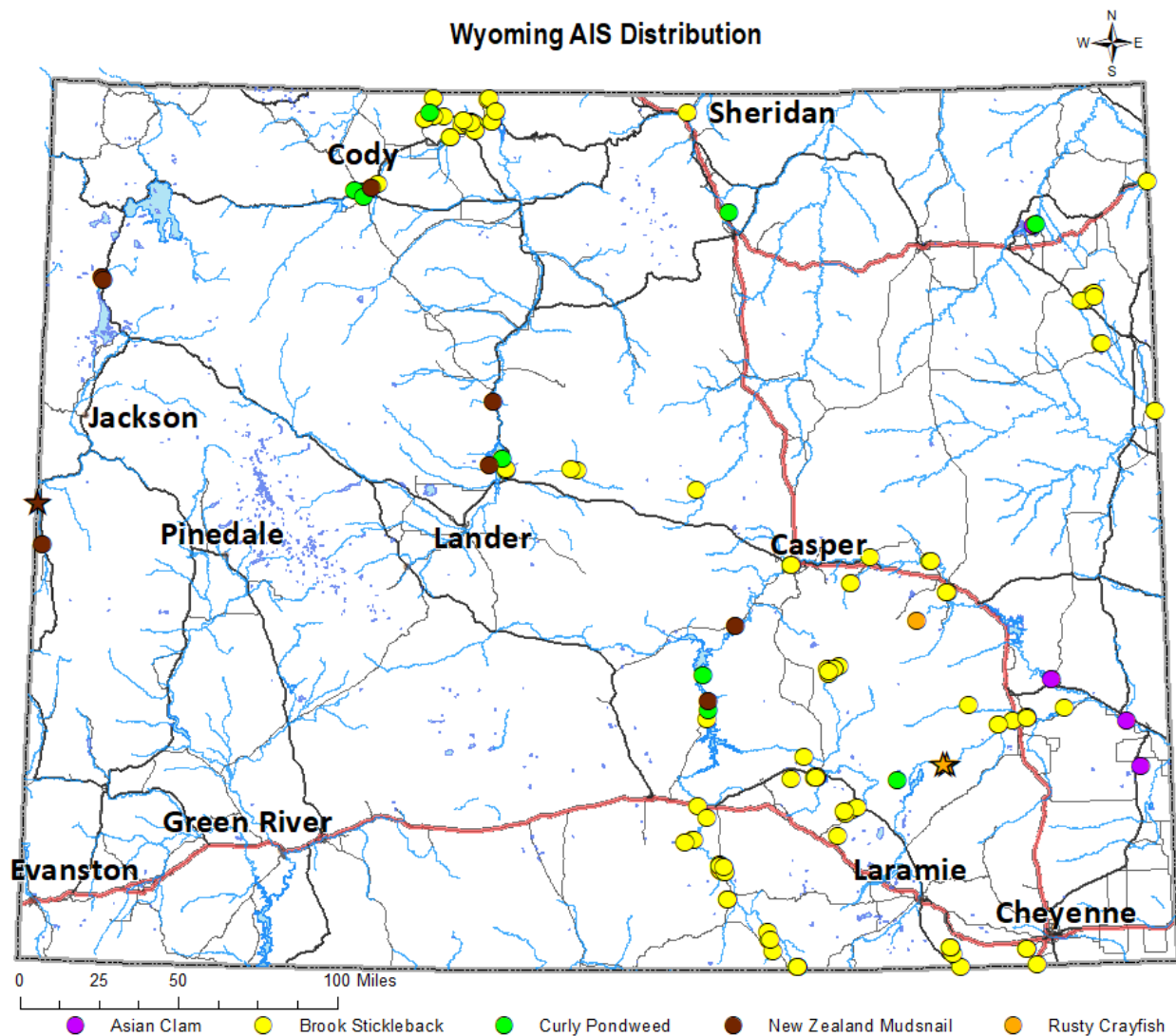


Figure 6. Distribution of aquatic invasive species populations in Wyoming as of 2020. Stars indicate new occurrences in 2020.

### 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, the Ft. Laramie canal, the Laramie River below Grayrocks Reservoir, Keyhole Reservoir, and in Horse Creek.

Brook stickleback are currently widespread in the North Platte, lower Shoshone and lower Bighorn River drainages in Wyoming. A few scattered populations are also found in tributaries to the Cheyenne, South Platte, Powder and Wind rivers. 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 has been documented in seven 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 mudsnail are currently found in Polecat Creek, Salt River, Bighorn River, Shoshone River, Lake Cameahwait, and at Miracle Mile, Cardwell Slough, and the North Platte River below Gray Reef Reservoir.

Rusty crayfish were first found in Wagonhound Creek, a North Platte River tributary, in 2006. Two subsequent eradication efforts were conducted. Sampling in 2019 in lower Wagonhound Creek did not find any evidence of rusty crayfish and they have not been documented in the North Platte River near the confluence with the creek. In 2020, new populations of rusty crayfish were found in the section of the Laramie River below Wheatland Reservoir #2 on the Dodge Ranch to just below the Tunnel Reservoir where Tunnel Road crosses the Laramie River. Rusty crayfish were also found in Bluegrass Creek below the diverted water from Tunnel Reservoir, which ultimately ends up in Sybille Creek; however, rusty crayfish have not yet been detected in Sybille Creek.

## 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 2020 was \$1.29 million.

In 2020, a total of 58,559 decals were sold resulting in receipt of \$825,015 (Table 2). Of the resident motorized decals sold, 6,388 (\$191,640) were three-year decals. From 2019 to 2020, the number of decals sold increased by 10,058. Sales of both non-motorized and motorized decals for residents and non-residents increased, with a higher percentage being non-motorized, resulting in an overall increase in revenue of \$142,250.

Table 2. Type, count, and revenue generated from AIS decals sold in 2020 compared to 2019.

Decal type	Count		Revenue	
	2019	2020	2019	2020
Resident Motorized	13,460	16,202	\$241,600	\$295,680
Resident Non-motorized	19,074	23,106	\$95,370	\$115,530
Nonresident Motorized	7,086	8,336	\$212,580	\$250,080
Nonresident Non-motorized	8,881	10,915	\$133,215	\$163,725
<b>TOTAL</b>	<b>48,501</b>	<b>58,559</b>	<b>\$682,765</b>	<b>\$825,015</b>

