Wyoming Game and Fish Department

Jackson Region Angler Newsletter

Volume 13 2019

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Fish Management in the Jackson Region

Welcome to the 2019 Jackson Region Angler Newsletter! We had another great year managing the Jackson area fisheries. Inside you'll find updates from our work in 2018 and some of the upcoming work for 2019.

As always, please feel free to contact us or stop by with any comments or questions about the aquatic resources in western Wyoming. Your input is important to us as we manage these resources for *you*. You'll find all of our contact info on the last page of this newsletter. We wish you tight lines during the 2019 season!

Diana Miller
Fisheries Biologist

Rob Gipson
Fisheries Supervisor

Clark Johnson
Fisheries Biologist

Anna Senecal
Aquatic Habitat Biologist

Chris Wight
AIS Specialist

Horse Creek Cutthroat Movement

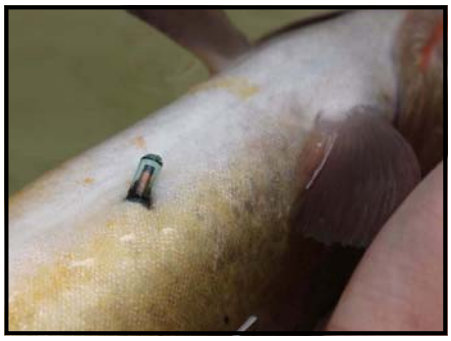
Fish managers are very interested in how well fish are able to travel through waterways and how well they can navigate potential impediments such as culverts and irrigation diversions, which can prevent fish from reaching important habitat. In the spring of 2018, a fish movement study was initiated on Horse Creek, a tributary to the Snake River near Hoback Junction. Horse Creek currently passes under Highway 89 and through an undersized culvert. The stream channel inside of the culvert has eroded over time. It is believed that this culvert is a velocity barrier to some sizes and species of fish at certain times of the year.

Wyoming Department of Transportation plans to widen Highway 89, including replacing the culvert in 2019 or 2020. In order to evaluate how fish move through the current culvert, as well as how they may move through the new culvert, we implanted fish with Passive Integrated Transponder (PIT) tags. A series of PIT tag trackers were installed above and below the Highway 89 culvert, above and below an irrigation structure on the Horse Creek Wildlife Habitat Management Area, and one on the national forest between the two.

Unfortunately, all 5 PIT stations were blown out during high water in mid to late May. The stations upstream and downstream of the highway were reconstructed once flows were no longer dangerous in early to mid July. When PIT stations were functional, 29 of the 81 fish with PIT tags moved through at least one station. All movement occurred at the stations around the highway, no movement occurred at the upstream stations. Peak movement times were late April to early May and mid-late July. The time between detections at the station downstream of the highway and the station above the highway ranged from 7 hours to almost 31 hours and fish size ranged from 4.6-11.9 in. Downcutting within the culvert has created a nice pool which provides good fish habitat during some flows, allowing fish to take their time moving through the culvert. Sixteen fish passed the downstream station and were not detected at upstream stations, indicating that they either could not pass through the culvert, didn't attempt to pass through the culvert, or passed the upstream station while it was inoperable. Fish tracking will continue in 2019 with emphasis on the highway culvert… Continued on page 3.

Two different sized PIT tags that were implanted in Snake River Cutthroat Trout.

Fisheries biologist, Diana Miller, implanting a PIT tag into a Snake River Cutthroat Trout.



PIT tag in a Snake River Cutthroat Trout just before full insertion into the body cavity.

Similar efforts are being planned for Game Creek to evaluate fish passage at the recently replaced highway culvert. PIT antennas will be installed at the up and downstream faces of the culvert and tagged fish will be recorded. This information will tell us when fish move and how long it takes them to navigate the culvert. In this race, the slower the better! Slower passage times indicate plenty of places for fish to stop and rest.

Box containing PIT reader and batteries that run one PIT station.

PIT tag antennas are placed in the stream and connected to the box pictured on the left.

Post Fire Surveys

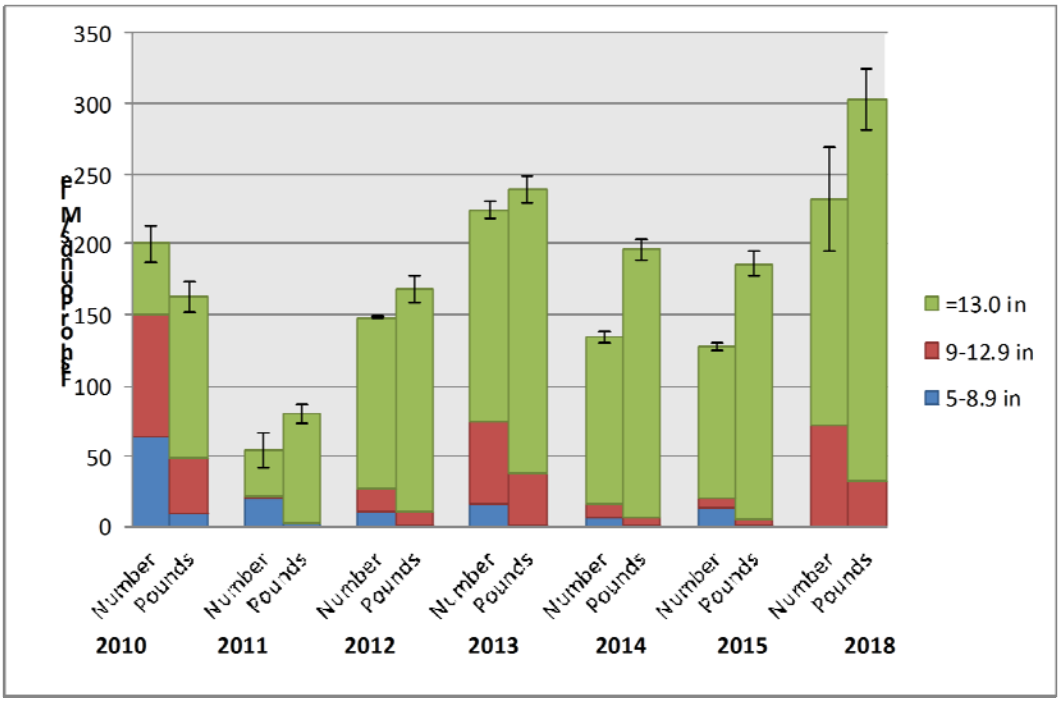
On September 15th, 2018, the Roosevelt Fire began to burn in the Upper Hoback River drainage. This wildfire burned, unconstrained, for almost a month and wasn't declared "out" until late November. During this time, the Roosevelt Fire burned more the 61,000 acres in the Hoback River drainage and the Beaver Creek drainage. The effects of wildfire on fisheries varies considerably by location, slope, and intensity of burn. In order to evaluate the immediate impacts of the Roosevelt Fire on fisheries in the Hoback drainage, we will be sampling the Upper Hoback River and it's tributaries in the summer of 2019. Nine sites that were previously sampled in 2012 will be revisited and fish presence, absence, and abundance will be compared between years. Additionally, three previously established population estimate sites (downstream of Upper Hoback Canyon) will once again be sampled and trout population estimates will be conducted.

Roosevelt burn in the South Fork Hoback River

Flat Creek Population Estimate

Flat Creek through the National Elk Refuge is a popular fishery that is home to a strong population of trophy Snake River Cutthroat Trout. This section of the creek is open to angling from August 1st to October 31st with artificial flies only during daylight hours. A population estimate is conducted on this section each year to monitor the size and abundance of trout. In 2018, we estimated 232 Snake River Cutthroat Trout per mile, with 159 of those fishing being 13 inches or larger. The number of fish is as high as it has been since 2013, and the estimate for pounds of fish per mile was higher than anything recorded in the last decade (shown below).

Fisheries Technician Max Lewis with a Flat Creek Snake River Cutthroat Trout (photo by Ben Deford).

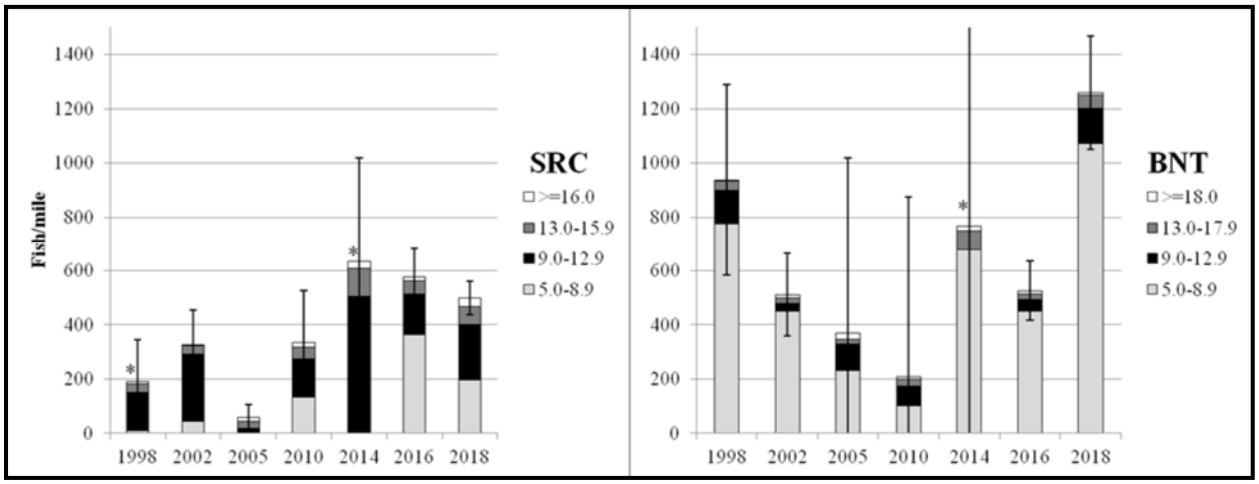


Trout Tuesdays

Trout Tuesdays is a program that was launched in 2018 and will continue in 2019. On each Tuesday in June from 5-8 PM, members of our fisheries crew and other volunteers gather at R Park near Wilson to provide assistance and help to anyone who wants to learn how to fish. We provide various types of fishing equipment, help with purchasing fishing licenses, and bilingual instruction to individuals and families of all ages. If you're looking to get into fishing, please come by R Park and we'd be happy to help! If you're interested in helping teach others to fish during this event, please contact us (contact info at the end of this newsletter) or stop by the Wyoming Game and Fish office in Jackson.

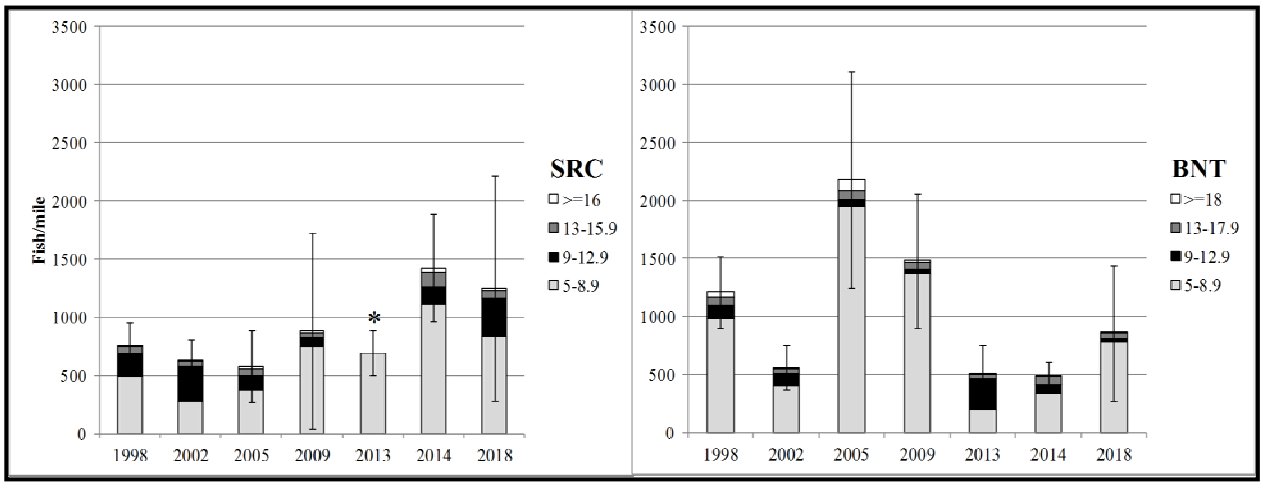
Salt River Population Estimates

This year we conducted population estimates for Snake River Cutthroat and Brown Trout on two sections of the Salt River; downstream of HWY 238 bridge (the Narrows) and downstream of HWY 237/Auburn-Grover Lane bridge (AG Lane). Starting in 2016, the AG Lane estimate has been conducted at night, which leads to much higher capture rates, resulting in more reliable estimates. Most notable was the huge increase in the number of smaller (5-9 inch) Brown Trout that were sampled. The total estimates for trout 5 inches or larger on the AG Lane section were 499 SRC per mile and 1,259 BNT per mile.



Snake River Cutthroat (SRC) and Brown Trout (BNT) population estimates for the AG Lane section of the Salt River. Error bars depict standard error. Asterisks indicates that size classes were combined to generate an estimate.

The Narrows section continues to hold good populations of both SRC and BNT (shown below). Estimates for trout over 5 inches were 1,253 SRC per mile, but standard error (+/-) was high at 968. The BNT estimate was 859/mile, although standard error was high as well at 582.

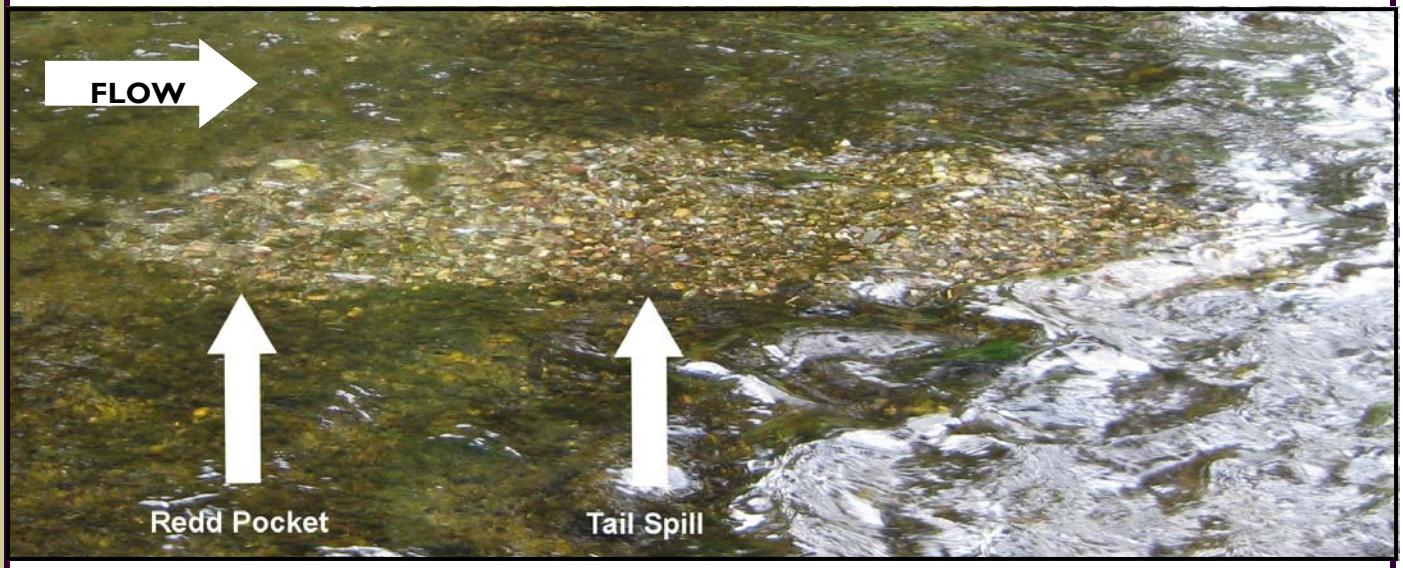


Estimates for SRC and BNT in the Narrows section of the Salt River from 1998 to 2018. Error bars depict standard error, which are largely driven by the 5-8.9 inch size fish. Asterisk in 2013 indicates a lack of sufficient recaptures for SRC size class estimates, one estimate of SRC ≥ 5.0 inches was generated. Note that size classes for BNT are different for large fish.

Local Spawners

Since 1965, Game and Fish has annually maintained a fish trap (middle photo) on a spring creek tributary to the Snake River to monitor numbers of spawning fish in the spring. In 2018, 298 Snake River Cutthroat Trout averaging 15.7 inches moved upstream through the trap. During this time, the Wyoming Game and Fish collected milt from some of the males in order to add wild genetics back into the hatchery brood stock.

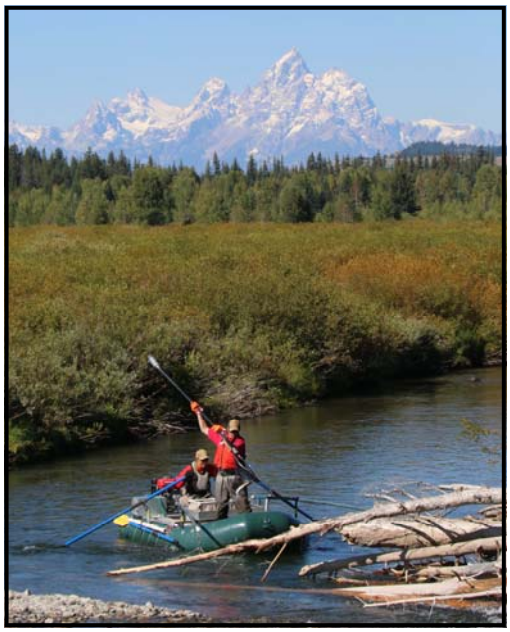
Starting in 2019, Game and Fish will be assisting a graduate student from the University of Wyoming who will be studying this spawning run in an attempt to better understand how the number of spawning fish relates to the production of young. In addition to this question, the graduate student will be conducting redd counts on the stream to identify how many fish use certain spawning areas, how fish create redds on top of previously created redds (called superimposition), and the impacts of that superimposition on the next generation of fish.



A redd (above) is a spawning site or nest that a female will construct in the gravel to lay her eggs. To build a redd, a female trout cleans the gravel with her tail, and sometimes uses her entire body. This creates an excavated "redd pocket", or depression, in the gravel that is clear of fine materials, such as silt, and algae. While excavating the redd pocket, the female also makes a "tail spill" or mound of gravel downstream with spaces in-between the gravels for the eggs to lodge. The redd is shaped so that oxygen-rich water flows past the eggs.

Snake River Cutthroat Trout prefer gravels from one to two and a half inches in diameter for constructing redds. Gravels suitable for redds are typically located in riffles – shallow areas anglers and other recreationists use to cross streams – so learning to identify them is important for maintaining healthy trout populations. To avoid redds when you are in a stream, keep an eye out for clean gravels with no silt or algae covering the rocks. Be careful not to step in the mounded tail spill area when you are fishing or crossing a creek.

Buffalo Fork Sampling



2018 was the first year we have been able to conduct a population estimate on the Buffalo Fork River near Moran. In the past, the Buffalo Fork's water chemistry made electrofishing ineffective because of its very low conductivity. But, new electrofishing equipment has become available to more effectively be used in very low conductivity water. Even with the newer equipment, catching and re-capturing enough Snake River Cutthroat was difficult. The majority of fish captured were greater than 13.0 inches (103 of the 150 fish), but few recaptured fish led to estimates with high standard errors as shown in the table below, giving us a less reliable estimate.

Despite the new electrofishing units being more effective than our old units, they were maxing out our 5000 watt generators, and we plan to try again for the next 2-3 years with further modifications to our electrofishing rafts.

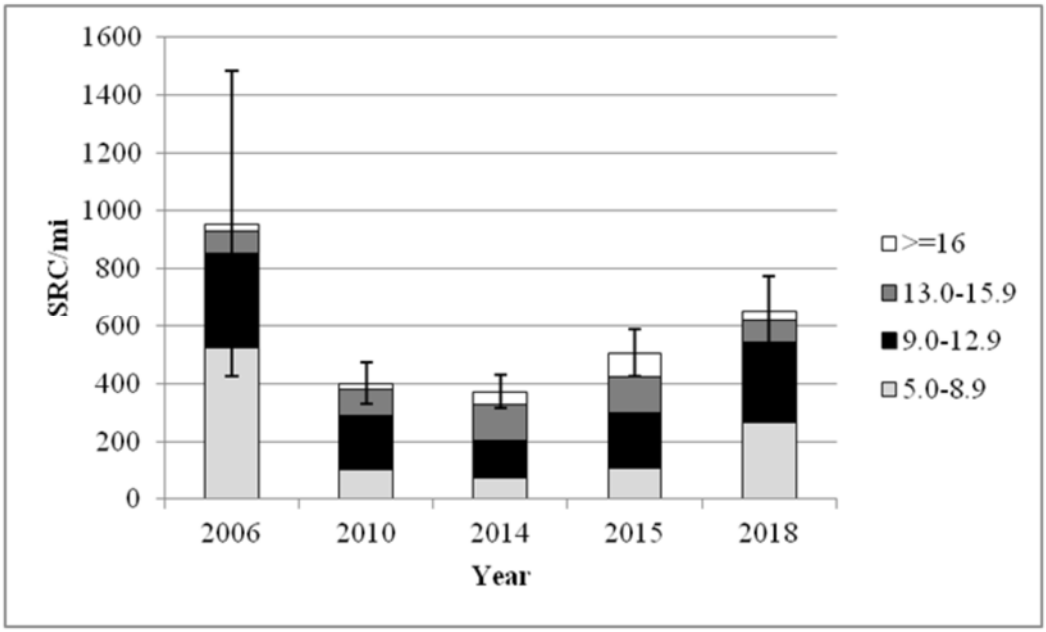
Species	Size Group	Number	Mean Length	Number/mi ± SE	Mean Weight	Pounds/mi ± SE
SRC	≥5.0;≤12.9	43	9.6	170 ± 157	0.35	63 ± 96
SRC	≥13.0;≤15.9	59	14.6	49 ± 12	1.03	51 ± 8
SRC	≥16.0	34	16.8	26 ± 8	1.63	42 ± 9

Number sampled, mean length (inches), number per mile with standard error, mean weight (lbs), and pounds per mile with standard error for fish captured in 3.0 mi of the Buffalo Fork River from Aug 28-31, 2018.

A large log jam that required portaging the electrofishing equipment and rafts.

Snake River Population Estimate

Each year a population estimate is conducted on one of three monitoring sections of the Snake River. In 2018 we conducted a population estimate on the Deadman to Moose section between Cowboy Cabin Creek and Cottonwood Creek. These estimates are conducted in October after releases from Jackson Lake Dam have been decreased. This year we estimated the number of Snake River Cutthroat Trout (SRC) above 9 inches to be 390 (+/- 75) per mile. Despite higher number of fish overall, numbers of large fish (>13 inches) was lower than previous years, and the majority of fish were 5 to 12.9 inches. Population estimates on this section of the Snake River are shown below since 2006.



Abundance estimates for SRC from a mark-recapture estimate for a 5 mile section of river at elevation 6,555 ft of the Snake River between Deadman and the Bar BC Ranch, 2006-2010 and a 5 mile section of the river at elevation 6,525 ft between Cowboy Cabin Creek and Cottonwood Creek, 2014-2018. Error bars depict ± SE for the SRC ≥ 5.0 in estimate.

Grand Teton Lake Surveys

Upcoming in 2019 several lake surveys will be conducted in the Snake River Basin in Grand Teton National Park. Some of the lakes see moderate use by anglers, and others see heavy use by hikers during the summer. The following list contains the lakes we plan to survey, along with the dates that they were last surveyed by Wyoming Game and Fish Department.

- Jenny Lake—2016
- Trapper Lake—2013
- Bearpaw Lake—2013
- Pilgrim Lake—2005
- Bradley Lake—1987
- Taggart Lake—1987
- Leigh Lake—1967

Aquatic Invasive Species

The Department's Aquatic Invasive Species (AIS) program will open its watercraft inspection stations for the 2019 summer boating season in two stages. The check station at the Alpine Port of Entry on US-26 will open on Saturday April 27th. The Alpine station will be open 7 days a week through September 30th. Check station hours will be 7am to 5pm Monday through Wednesday and 7am to 7pm Thursday through Sunday. The check station on Salt River Pass US-89 will open Saturday May 25th and run through September 30th. Hours of operation will be 8am to 6pm Thursday through Sunday. Closed Monday through Wednesday. A rotating check station will begin operation at the top of Teton Pass HWY-22 in July on a rotating basis. Boat inspections are also available at the Jackson regional office at 420 North Cache St. Monday through Friday 8am to 5pm. Closed holidays. Remember, the law requires all boats entering WY from April-October to be inspected before launching.

New Zealand mudsnails in the Salt River.

During the summer 2018 sampling season, an invasive gastropod called the New Zealand mudsnail, was discovered at two separate sites on the Salt River in Star Valley. Populations were sampled at the McCoy Creek bridge south of Alpine and at the Diversion boat launch and fishing access site south of Thayne.New Zealand mudsnails are non-native snails that pose a threat to your fisheries. They can alter water chemistry through filter feeding and reproduce at rapid rates. They crowd out habitat suited for macroinvertebrates that make up a significant portion of a trout's diet. The New Zealand mudsnail can also shield itself from toxins in the water through the use of an operculum plate, making chemical removal of the species impossible. Game & Fish AIS personnel will spend ample time post-runoff determining the breadth of this infestation.

This is the first infestation of New Zealand mudnsnails in the Salt River and the Star Valley area. Mudsnails are present in the upper Snake River drainage above Jackson Lake at the Flagg Ranch bridge and in Polecat Creek. They also exist in other waters throughout the Greater Yellowstone ecosystem. Currently, populations have only been identified at Diversion in a small, concentrated area of woody debris and at McCoy Creek in a single side channel. Game & Fish urges anglers and other water users to clean all fishing and boating gear between uses and before they visit another water body. In doing so, the risk of these invasive species being spread to new waters will be greatly reduced.

Diversion boat launch and fishing access site—Thayne.

Jackson Lake Trophy Tagging

Our annual trophy Lake Trout sampling took place from October 15-18, 2018 on Jackson Lake. During that time, we captured 161 Lake Trout, ranging from 17.3 to 39.7 inches and between 1.51 and 29 lbs. All of these fish were captured over the course of 4 nights with 28 different short duration gill net sets.

Fisheries Technician Riley Young with a trophy Lake Trout netted 2018'

Captured fish are marked with a uniquely numbered tag behind their dorsal fin. Efforts to tag Lake Trout in Jackson Lake have been ongoing since 1987, and has been used to track growth rates and survival of trophy sized Lake Trout. This year, of the 161 lake trout captured, 43 were recaptured from previous years and 98 new fish were tagged.

Currently there are 3 different colors of tags that can be found in fish from Jackson Lake, and some carry a reward for reporting the tag number along with length and weight of the fish. A reward for reporting yellow tags is $5, and pink/red tags are $25. Green tags do not have a monetary reward, but all anglers are strongly encouraged to report tagged fish to supplement our growing dataset on Lake Trout in Jackson Lake. If anglers plan to release the fish, the tag can be clipped off, or a good photo of the tag where the numbers are legible is great also.

The largest fish netted this year was 29 pounds. There were 17 fish over 15 pounds and 40 that broke 10 pounds. There were two fish caught that were originally tagged 11 years ago, one of which had never been recaptured before. Also captured in the nets was a very large Utah Sucker (native to Wyoming) that would have broken the Wyoming state record. The fish was 26 inches long and weighed 9.25 pounds. The state record fish from 2003 was 28 inches and 8 pounds 4 oz.

A recaptured Lake Trout that was tagged 11 years ago (notice pink tag behind dorsal fin).

McNeel Feedground Fish Passage and Irrigation Improvement

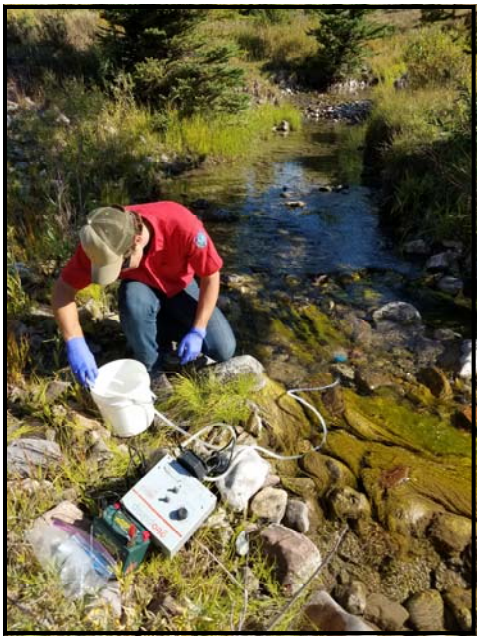
Construction was completed on the Upper Hoback River on McNeel elk feedground in October 2018. Equipment mobilized the day after the Roosevelt fire travel ban lifted and construction took less than two weeks (photo below). A gravel push-up dam had historically been constructed each irrigation season using heavy equipment in the channel to manipulate flows. These structures cause downstream bank erosion and can be barriers to upstream fish movements. The Hoback River is an important Snake River Cutthroat Trout spawning system and so connectivity for fish to move from spawning and rearing habitats to holding habitats is extremely important.

Looking upstream at the newly-constructed, stable cross vane diversion structure. Each rock measures 5-7 feet in diameter!

The gravel push-up dam was replaced with a permanent rock cross vane and the irrigation ditch was outfitted with headgates (photo above). These upgrades should prevent the need for future push-up dam construction within the Hoback River channel. The cross vane is constructed to allow for fish to move up and downstream, transport the river's cobble bed load, and also provide the necessary head to feed the irrigation ditch. This design has been used in rivers throughout Wyoming, from the Green to the Encampment, with great success. We are excited to have a stable, fish-friendly irrigation diversion on the map in the Hoback drainage and hope that the successes at this site translate to future projects throughout the region.

Construction of the McNeel elk feedground irrigation diversion.

Using DNA to Determine Fish Distribution



In 2017 a new project was launched using environmental DNA (eDNA) to determine distribution of two native fish species of special concern in the Gros Ventre and Fish Creek Drainages, the Northern Leatherside Chub and Bluehead Sucker. Although sparsely found other places in the region, Northern Leatherside Chub were not discovered within the Gros Ventre River basin until 2014.

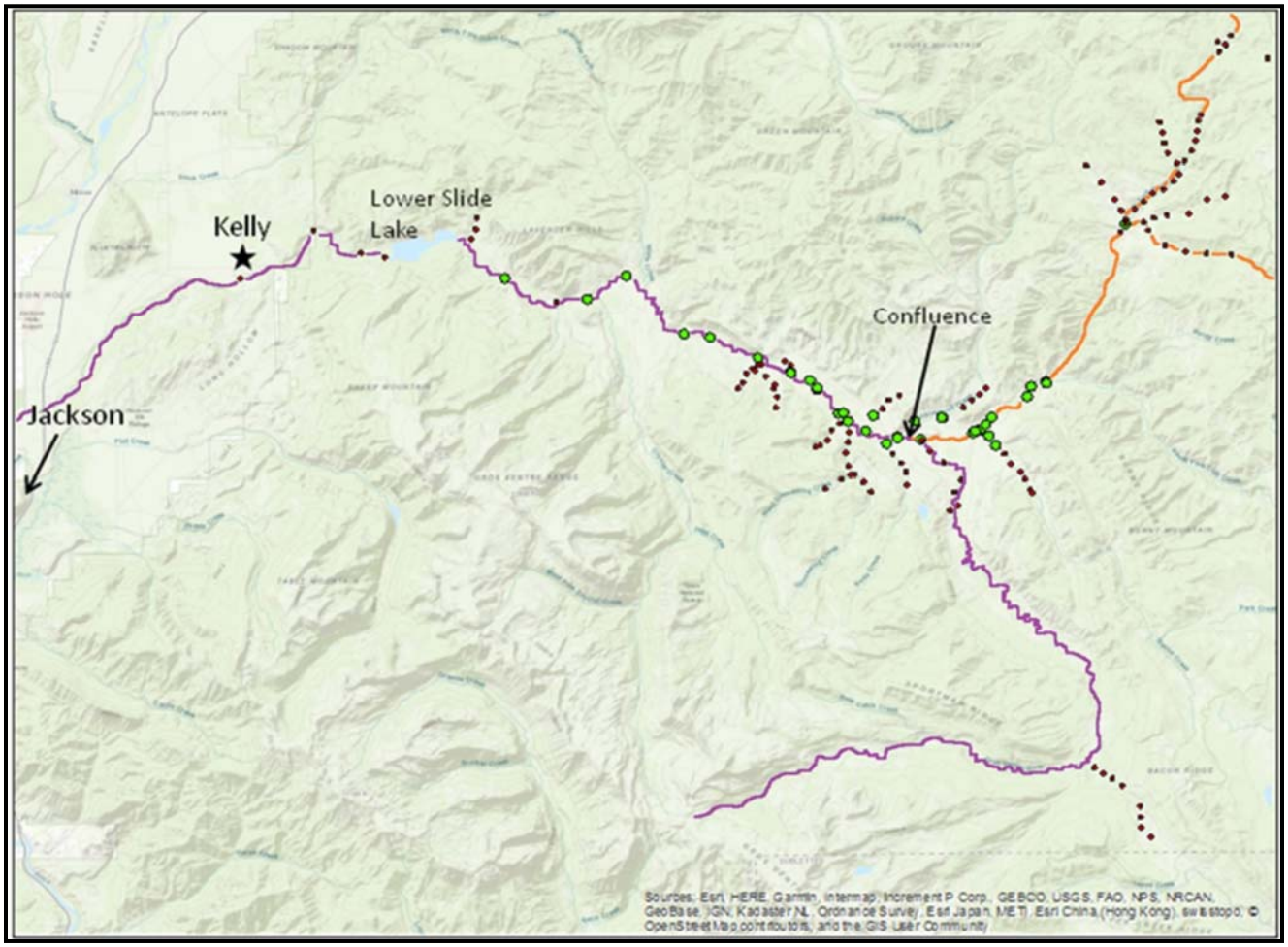
Environmental DNA is a relatively new tool fish managers have been using to determine distribution of different fish species. All life, including aquatic life, leaves DNA in their environment as they go about their daily routines. Sampling for eDNA entails filtering a pre determined amount of water through a small filter (left top photo), then preserving that filter in a bag of desiccant beads (second photo on left). The filters are later sent to a genomics lab to have any DNA extracted, then compared to pre-developed genetic markers for the species of interest. Because DNA can break down relatively rapidly in the environment, a sample is taken every 0.3 to 0.6 miles in a stream to get an accurate representation of distribution within the watershed.

Each sample we take will be checked for Northern Leatherside Chub and Bluehead Sucker DNA. Bluehead suckers have been found throughout the Jackson Region, but their overall distribution and abundance is still somewhat unknown. Currently a genetic marker is being created for the Snake River strain of Bluehead Sucker… Continued on page 13.

Northern Leatherside Chub (above) and Bluehead Sucker (right) are two native fish species of special concern in the state.

This was the second year of eDNA sampling to detect Northern Leatherside Chub and Bluehead Sucker in the Gros Ventre River and Fish Creek basins. In total, 81 samples were collected in 2018 to add to 2017's 70. Currently all samples from 2017 and 2018 have been processed for Northern Leatherside Chub DNA. Based on these results, Northern Leatherside Chub seem to inhabit portions of Fish, Cottonwood, Bacon, Breakneck, and Squaw creeks and the Gros Ventre River. Cottonwood and Fish creeks seem to have an influence on Northern Leatherside Chub in the Gros Ventre River, because no positive samples were collected above their confluence to the Gros Ventre River (map below). Of the 151 samples taken from the Gros Ventre and Fish Creek basins, 36 tested positive for Northern Leatherside Chub DNA.

Northern Leatherside Chub are typically found in smaller, slow flowing streams, so it was interesting to have positive locations localized to the Gros Ventre River and it's two largest tributaries (Fish and Cottonwood Creeks). In 2019 we plan to collect fish in these areas to determine in any adult Northern Leatherside Chub are present. Also, we will gather the remaining genetic samples needed to verify and refine the Bluehead genetic marker to be able to process all 151 samples for Bluehead Sucker DNA, and gain distribution information on them within the Gros Ventre and Fish Creek basins.



Environmental DNA sampling sites within the Gros Ventre (purple) and Fish Creek (orange) basins. Larger green dots depict samples that contained Northern Leatherside Chub DNA, sites negative depicted by smaller red dots. Positive sites were localized to the Gros Ventre River, Fish or Cottonwood creeks, or near the confluence of these streams.

Wyoming Game and Fish Department
Conserving Wildlife-Serving People

Jackson Regional Office
420 N. Cache St
Jackson, WY 83001
P.O. Box 67

Phone: 307-733-2321
Fax: 307-733-2276

Important Dates to Remember in 2019

Beginning in 2019, fishing licenses are valid 365 days from the date of sale instead of by calendar year, allowing you more fishing for the same price!

- March 1—November 30 — **AIS Inspections** *All watercraft entering from out of state must be inspected prior to launching in Wyoming.*
- May 1 — **Winter Closures for Wintering Wildlife Lifted**
- May 9-11 — **Wyoming Outdoor EXPO** *The Wyoming Game and Fish Department has reinvested in this annual event at the Casper Event Center to highlight and celebrate Wyoming's fish and wildlife resources and the different work conducted by Wyoming Game and Fish.*
- June 1 — **Kids Fishing Day (Afton and Jackson) and Wyoming's Free Fishing Day** *The Wyoming Game and Fish Commission has declared June 1, 2019 Free Fishing Day to coincide with the beginning of the National Fishing and Boating week. On this date, residents and nonresidents may fish Wyoming waters (excluding Wind River Indian Reservation and Yellowstone National Park) without a fishing license or conservation stamp. Free Fishing Day will also coincide with Kids Fishing Day in Afton (Afton Golf Course) and Jackson (R-Park).*
- June 1 — **Watercraft Inspection Training for the Public** *Help prevent the spread of harmful Aquatic Invasive Species by becoming a Wyoming certified inspector. Training will start at 4:00 pm at the Jackson WGFD Regional Office. Contact Chris Wight for details.*
- June 4, 11, 18, & 25—**Trout Tuesdays** *This bilingual event is open to all ages and is designed to provide one on one interaction for those that need a little extra help learning to fish. The event will be held at R Park from 5-8 PM.*
- August 1—**Flat Creek on National Elk Refuge opens to fishing** *The National Elk Refuge is closed to fishing from November 1 to July 31. Fishing is permitted by the use of artificial flies only, and fishing is restricted to daylight hours.*
- September 5—**Jackson Hole One Fly** *The Jackson Hole One Fly Foundation hosts an annual fishing event to generate, manage and grant funding for projects and education which environmentally benefit the future of trout and fly fishing.*
- October 1-31—**Jackson Lake closes to fishing** *Jackson Lake is closed to all fishing for the month of October in order to limit disturbance to spawning Lake Trout.*

We welcome all questions and comments on this newsletter or about the fisheries resources within the Jackson Region. Please feel free to call or send an email to:

Rob.Gipson@wyo.gov (Regional Fisheries Supervisor)
Diana.Miller@wyo.gov (Fisheries Biologist)
Clark.Johnson@wyo.gov (Fisheries Biologist)
Anna.Senecal@wyo.gov (Aquatic Habitat Biologist)
Chris.Wight@wyo.gov (AIS Specialist)