

REGION 5 SOUTH CENTRAL MONTANA

Bighorn River

Mike Ruggles, Fisheries Biologist

The Bighorn River came up very often in conversation this past year. Those conversations typically centered around too much water, dirty water, warm water, weedy water, and only a few fish or no fish hooked per day. Those following management of the river and Yellowtail Dam know the Bureau of Reclamation created a technical group to review the current operating criteria. Back to back high-water years and frequent larger water releases created issues for river anglers, downstream landowners, and business that rely on anglers and floaters. The Bighorn Alliance initiated a campaign with the goal of having the criteria reviewed and recommendations for improvements to be implemented. Additionally, the Montana Fish and Wildlife Commission held a public meeting resulting in a request for the BOR to review and amend the criteria for high inflow years. Friends of Bighorn Lake used a similar approach during the drought of the 2000's to encourage the BOR to review the operations which lead to the current operational plan. The advisory group made of stakeholders from Montana and Wyoming met several times since April 2018 with more meetings to come in the next several months. This report will attempt to provide a summary of the water conditions and a status report of the fishery.

The fishery obviously relies on water but how and when the water arrives can influence the fisheries in many ways. Timing of high and low flows, chemical and physical property of the water are controlling factors. The reservoir is managed to hold 1.02 million-acre feet, with about another 300,000-acre feet of additional flood storage. Figure 1 provides inflow data for April through July, (runoff) into Bighorn Reservoir since the dam was constructed in 1967. Since the



While angling was tough in 2018, expectations are for conditions to improve. There are some great fish out there as Fisheries Crew Leader Earl Radonski shares with this catch of a 25-inch 6.2-pound brown trout this past fall.

implementation of the new operating criteria in 2010 the reservoir has exceeded inflows from April 1st to July 30th of 1.75 million-acre feet in 2011, 2017, and 2018 with a high reaching nearly 3 million-acre feet in 2018. During those years all of the water in the reservoir is exchanged in a short time period, with most typically coming in during June. This is unlike the inflows from 2000 to 2007 when inflows didn't exceed 1.1 million-acre feet. The dichotomy of the two time periods challenged water managers and users alike.

Figure 2 illustrates the timing and rate of water release for the inflows for water years 2011, 2016, 2017 and 2018. These past high water years have been very challenging for river users with high flows, and turbid warmer than normal water. Since 1967, water years 2011, 2017, and 2018 are the largest water years for April through July inflows while 2016 was near average. The new criteria has reduced November to March flows when compared to pre and post criteria. It was common for winter releases to exceed 3,000 cfs until the drought years and criteria change starting in 2000. Winter of 2017/2018 matched more historic winter releases with winter flows averaging over 4,000 cfs.

Reduction in winter flows are a result of targeting higher end of March reservoir elevations to more frequently reach spring reservoir elevations that leave all boat access sites usable. This also results in less available reservoir volume to capture the April to July inflows, when expectations of runoff are exceeded this can lead to higher than previously experienced flows to the river. Years such as 2011, 2017, and 2018 will always result in high releases as the inflows largely exceed capacity of the reservoir. It appears there may be room for water management adjustments in water years such as 2010, 2014, and 2015, which would still have higher releases but there may be opportunity to better shape the releases to support the fishery.

How is all this affecting fish habitat and the fishery? A study completed in 2012 by the BOR, "Bighorn River Side Channel Investigation: Hydraulic and Sediment Transport Analysis", concluded side channels were being plugged by encroaching vegetation which trap sediment. Translation, the Bighorn River as a controlled system decreased peak flows which let Russian Olive and Salt Cedar colonize inside the banks of the river which ultimately caught gravels plugging and reducing flows to side channels. Since the dam has been in place habitat complexity has declined, it is unclear when this decline will have detrimental effects to the fishery. Complex habitats support quality fisheries. While the study recommendations were not implemented through a planning process, mother nature delivered those conditions. Figure 2 color shaded areas show recommended intermediate flows in yellow and scouring flows in red. To re-establish complex habitats i.e. side channel connectivity scouring flows of 10,000 to 15,000 cfs was recommended every two years and no less than 5 years passing between these flows. The scouring flows are intended to discourage brush from growing into the heads of the side channels. Flows of 6,000 to 10,000 cfs were recommend annually or no more than 2 to 3 years apart. The intermediate flows are expected to remove fine sediment from the side channels and limit vegetation from establishing in side

Bighorn Lake April through July Inflow Period of Record 1967-2018

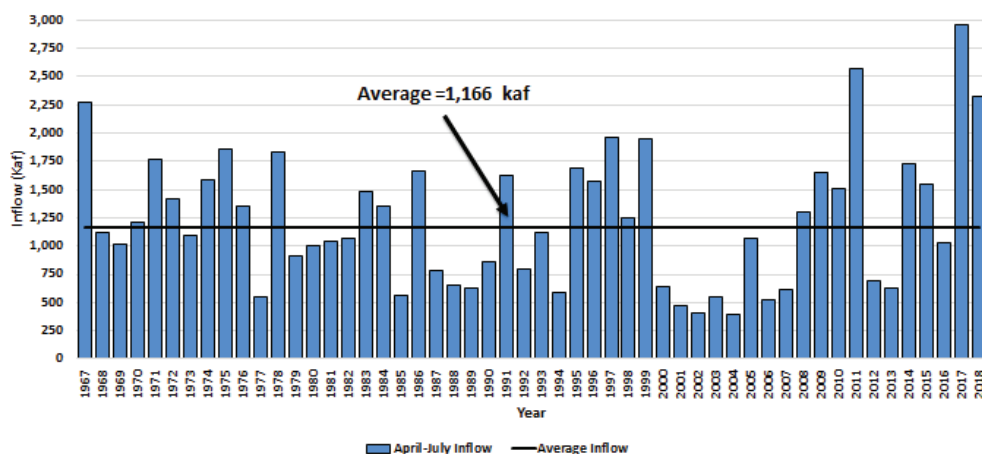


Figure 1. USBOR Bighorn Reservoir April through July inflow data, acre feet of water (x1,000).

Figure 1

channel fringes. The larger scouring flows and more intermediate flows were recommended to last between 12 to 24 hours. Diminishing returns were expected to occur with longer duration flows as most sediment is moved in the ascending limb of the hydrograph. Figure 2 depicts repeated extended scouring and intermediate flows as a result of above average runoff inflows. Plans are underway to re-evaluate the side channel response to these flows this coming summer. One side channel opening was excavated in 2012. Visually that project looks very successful it will be great to evaluate the changes and sediment transport capacity. It will inform us when looking at additional projects.

How has the fishery responded to these repeated complex habitat building flows? In the upper section, water years 1997 and 2011 resulted in several years of increased brown trout abundance. Lower water years 2000 to 2007 demonstrates brown trout struggled while rainbow trout responded with increased abundance with the peak occurring as the drought ended with a couple of more average water years. The high winter releases in 2011 supported a rebound for brown trout with the high flows coming in after brown trout hatched and left their redds. A deep concern for the fishery was voiced by anglers in 2018 as catch rates plummeted. The upper estimate completed during spring of 2018 indicated near average abundance for brown trout and rainbow trout with a total abundance of the combined trout fishery over 8 inches exceeding 3,000 trout per mile (Figure 3).

A similar trend over time in the lower river trout section occurred with brown trout favoring high water years and rainbow favoring average or below average water years. This pattern changed with the estimate completed this past fall. Brown trout numbers fell to the lowest abundance from 1992 to present. Rainbow trout remained stable but also below the long-term average. Combined the fishery for trout over 8 inches in the lower section was less than 500 fish per mile (Figure 4). In response to angler concern that somehow the fishery collapsed and considering the unexpected low abundance of lower section trout in the fall of 2018, crews returned to the upper river section to collect a single days' worth of fisheries data. Typical trout estimate collections require 6 total days or more on the Bighorn. While an estimate of trout per mile can't be completed in a single day a comparison of trout sizes and fish caught per minute was made.

The result was nearly the same number of fish captured per minute of electrofishing as in the spring estimate, with similar numbers of fish caught in each comparable size group. When comparing the fall 2018 lower section catch to the fall 2018 upper river catch, three times as many brown trout and nearly twice as many rainbow trout were caught in the upper section than in the lower section.

My expectation as the fish biologist was habitat improv-

ing flows and above average daily flows all year in 2017 and again in 2018 would create a response like 1997 and 2011 with more juvenile fish surviving combined with good growth leaving an abundance of 8 to 12-inch fish and good numbers of larger fish available.

It appears flows exceeding 7,000 cfs in April and not falling below 6,000 cfs before mid-July with flows over 10,00 cfs lasting for weeks or months doesn't support the expected response of increased abundance of trout. This may be a product of scouring flows limiting spawning areas and digging out or burying existing redds before the fry emerge from the

redds.

Habitat changes are evident as a result of these extended high flows. Many side channels appear to have been hydraulically improved. In the absence of scouring flows for a few years the fishery should quickly respond by producing a large year class of trout to fill the void the past two years of limited recruitment experienced. This doesn't address the present low catch rates experience

by anglers despite near average populations of brown and rainbow trout in the upper section and it is unclear why the lower estimate was as low as measured this past fall. Some theories for the low catch rate included increased water temperatures and turbidities, above

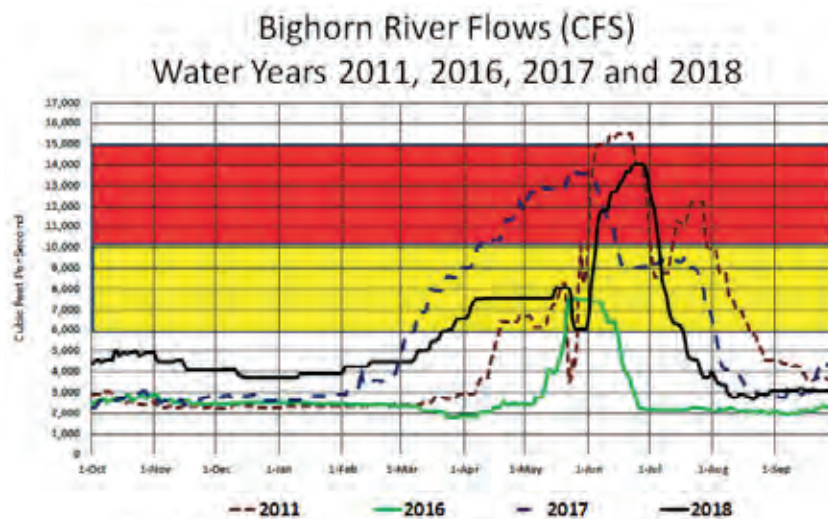


Figure 2

Bighorn River Upper Trout Section Population Estimate for Trout Greater Than Eight Inches

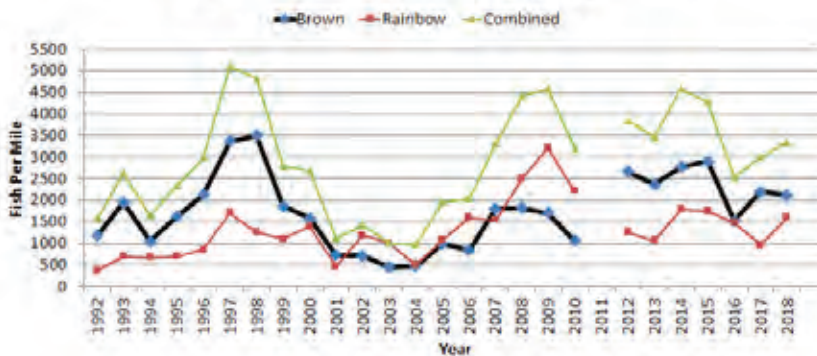


Figure 3. Bighorn River upper section trout estimates (Below Three Mile Access).

Figure 3

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average number of pelicans working the river, a major die off event that wasn't visible and others. The fisheries data indicated fish are available. Pelicans certainly hung out for a couple of months this year and ate their share of fish which probably included trout and plenty of white sucker, longnose sucker, and carp which are also abundant in this area.

During most of our field days we collect at least one or two water temperatures. While not as good as having water temperature data taken several times a day all year long this data can be used to compare measurements by year. The upper section data is collected typically between late May to Early July with temperatures averaging near 50 degrees. Figure 5 depicts summer and early fall temperatures with most data collected between mid-August to mid-September during the Mallards (lower) section trout estimate effort. There appears to be a close relationship between inflow and temperature. The higher the spring inflow the higher the summer temperatures conversely lower spring inflows result in lower river temperatures. This is a product of reservoir water volume exchange time and elevations of the spillway and power house intakes. The higher water temperatures in 1997 resulted in faster growth of juvenile trout. The elevated temperatures as a result of high inflows are not necessarily lethal. Although longer term data doesn't exist it is likely increased turbidities are also a product of large inflow years.

In summary, high inflows of 2017 and 2018 appear to not support the fishery as expected. Water temperatures and turbidities/color were higher than normal this year, but neither should limit the fishery. Those factors may affect catchability of trout by anglers, an abundance of aquatic vegetation may also be a factor. A study of gas saturation took place in 1990 and 1991 indicating high gas saturation can be an issue. Results of the estimates will be used to inform water managers what effects

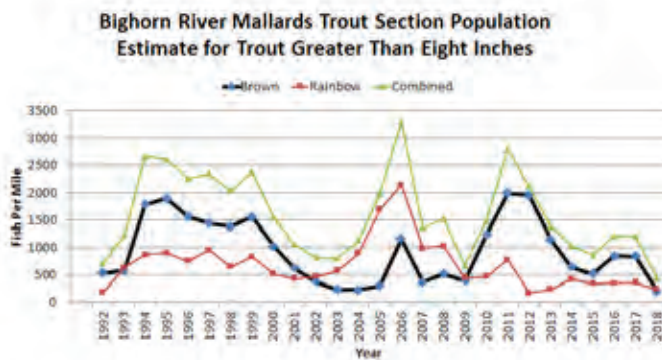


Figure 4. Bighorn River Mallards (lower) section trout estimates.

Figure 4

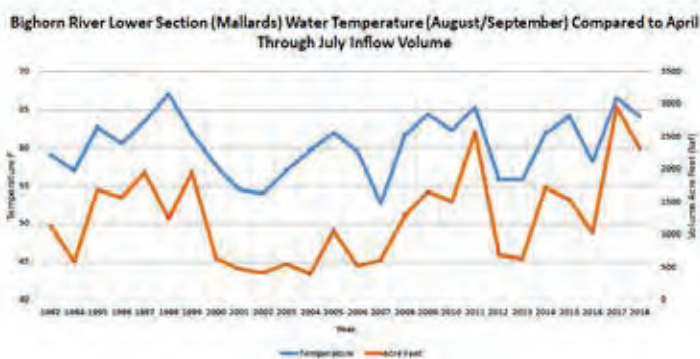


Figure 5

long lasting scouring flows may have on the fishery. The ability to control those very large events is limited by the relatively small size of the reservoir. It is hoped for years with above average inflows that some water management adjustments can be made to better manage fish habitat and the fishery. If a more normal or below average water year is experienced this winter and in 2019 it is expected the trout will respond with improved spawning success and recruitment into the fishery.

FISH TAG PROGRAM

Anglers are encouraged to submit the catch information for any tagged fish they catch. In some cases a fish may be tagged with a reward tag, which might cover the expenses of your fishing trip!

Tag information can be submitted online at
<http://fwp.mt.gov/fish/taggedFish.html>
or by emailing fwpfish@mt.gov:

Please report the following information:

- * The tag's number and color *
- * The date the fish was caught *
- * The species of the fish *
- * The fish's length and weight *
- * Location of the catch *
- * If the fish was kept or released *
- * The name, address, phone number of the angler *

Region 5 Mountain Lakes Program

Jason Rhoten, Fisheries Biologist

Every summer eager backpackers lug heavy packs filled with camp and fishing gear into the Absaroka-Beartooth mountains. Some hike many miles to angle for trout that could be called “naïve” as they rarely see a fly or spinner and yet others hike the many miles to enjoy fishing in solitude with breathtaking backdrops. While there are lakes that do hold “naïve” trout there are only a couple that are suspected to contain aboriginal populations. Nearly all the high mountain lakes in the Beartooths that contain a fishery are a result of historic introductions and fish stocking. Some lakes have fish populations that are self-sustaining while others are not able to recruit and are dependent upon routine stocking and management.



Kaufman Lake - Beartooth Mountains.

The Absaroka-Beartooth fishery is a very valuable and important fishery that receives lots of attention from anglers and fisheries personnel. The mountain lakes program in Region 5 has a long history. This sampling program really began when Pat Marcuson, a FWP fisheries biologist stationed in Red Lodge, became obsessed with surveying all 952 lakes in his management area in the Absaroka-

Beartooth Mountains in Montana. Pat started his sampling efforts in 1967 and continued through the rest of his career with FWP. Once all the lakes in the Absaroka-Beartooth Mountains had been surveyed, Pat expanded his efforts to lakes in the Crazy Mountains. He collected depth, habitat, and water chemistry data on all the lakes, and even packed a rubber raft into many of the larger lakes to develop contour maps of the lakes. Pat developed fisheries management and stocking plans for many of the lakes which still provide the basis for the mountain lakes management plan we have today. The current high mountain lakes monitoring program was initiated in 1989 with the objective to collect fisheries data from the approximately 320 lakes with fish in and around the Absaroka-Beartooth Wilderness and roughly 20 lakes in the Crazy Mountains. Lakes are sampled on a prioritized basis with a goal of sampling every lake at least once on a 10-year cycle. This program continues today, and the four-person mountain lakes crew includes two college students who participate in our internship program. Students gain precious experience while contributing significantly to data collection efforts.

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Fisheries crews go to great lengths to monitor the fisheries, literally great lengths. In 2018 crews sampled 51 lakes that came at the cost of roughly 162 miles on hiking boots during the months of July and August. Crews have a short window of time to complete the sampling because in the high elevation winter conditions hang on and lakes remain ice covered until July and are often iced over by October. Due to remote location and difficult access it may take up to 10 years to sample all the lakes.

Collected data is used to manage the fisheries for both fishing opportunity and species conservation. The remote location and high elevation offer forms of protection for unique species conservation. Golden trout, arctic grayling and Yellowstone cutthroat trout are three of the species that fit this category. Golden trout are often sought out by anglers looking to cross them off their “bucket” list. Golden trout are found in some of the more remote backcountry lakes and are a species notorious for being tight lipped. Sylvan Lake is Montana’s source for golden trout eggs. The eggs are collected every 6 years then taken back to the hatchery and raised until they are stocked in other locations.

Data collected is also used to guide management decisions with intent to maintain or improve fishing opportunity. The data is carefully interpreted and directs decisions regarding stocking rates and frequency. Lakes that are easily accessed are stocked on a 2-4-year frequency while lakes with difficult access and infrequent visitors are stocked on an 8-year cycle. Most trout age out in mountain lakes by age 8 therefore, in stocked lakes it is very important anglers pay special attention to when a lake was last stocked. Stocked mountain lakes should have small fish willing to bite within 2-3 years of being stocked. In stocked mountain lakes, as the size of the stocked fish increases the fish density and subsequently catch rates will decrease. Anglers looking for trophy sized trout and willing to work harder to catch them should target lakes 5 to 7 years after stocking. The R5 Mountain Lakes Guide is a great place find recent mountain lake stocking information.

The R5 Mountain Lakes Guide is a priceless tool for anglers and campers heading into the backcountry. It provides information about each lake’s fishery including last fish sample data, stocking information, trail length, camp conditions and the list continues. The perfect destination is highly variable from person to person, but the Guide is an excellent tool that can be used to narrow and plan an anglers next trip. The R5 Mountain Lakes Guide can be found at <http://fwp.mt.gov/regions/r5/mountainlakes.html>.



Above - Grayling from Kaufman Lake.
Below - Golden trout - Beartooth Mountains.



Region 5 Fishing Access Site Program

Ken Frazer, Regional Fisheries Manager

Region 5 Fishing Access Sites were seriously impacted by the extended high flows experienced on the Yellowstone and Bighorn rivers this past spring. Most regional FAS's along the Yellowstone River were closed to walk-in use only and some were totally inaccessible for several weeks this spring due to flooding. Once high flows dropped the FAS crews had a major job cleaning up and preparing these sites so they could be safely reopened. Some of these repair projects are still ongoing.

Vehicle access to two sites remained an issue throughout the summer. Indian Fort FAS located at the town of Reed Point upstream of Columbus is a very popular site for both campers and floaters on the Yellowstone. It has 12 developed camp sites that are full most of the time during the summer. It is also a key access site for recreational floaters and anglers who use this site to take out or launch boats depending on what section of the Yellowstone they plan to float. Indian Fort FAS also normally provides a

key access and camping site each year for hundreds of floaters participating in the annual Yellowstone River Boat Float. The access road into the site is squeezed between near vertical rock cliffs and the river. The extended high flows this past spring removed a lot of the rip rap along the toe of the road and washed away about 1/3 of the road surface along the cliff area. The remaining road was too narrow to safely drive on, especially with a camp trailer or boat, so the FAS remained open to walk-in traffic only for most of the summer. FWP received several of complaints about this closure from recreationists. The Yellowstone Boat Float had to be completely rerouted for the 2018 season, and the lack of recreational users at the site had serious economic impacts to the town of Reed Point. Regional FAS crews, using local rocks and gravel provided at

a reduced cost by the county were able to rebuild the road surface into the site enough to reopen the road for limited use this fall. However, this is only a temporary fix. Without rebuilding and armoring the river bank this new road surface will not survive another high flow event. Repairing access to Indian Fort FAS is the highest priority FAS project in the Region, but the required repair of this road will be expensive, and money isn't available in the regional funding for capital projects. The Helena FAS program is looking for emergency funds from other sources to rebuild the river bank and protect the access road before high water next spring. If repairs must wait for new capital funding in next year's budget, vehicle access to Indian Fort FAS could again be limited by high water next spring.



End of the road into Grant Marsh FAS.

Grant Marsh FAS located on the lower Bighorn River has been open to walk-in access only since extended high flows in 2017 washed out the access road to the boat ramp in two places. This is a popular access site for jet boaters on the lower Bighorn and is used by both anglers and waterfowl hunters. Grant Marsh has suffered serious erosion problems since 2010 caused by extended periods of high flows

on the Bighorn River resulting from water management changes initiated by the Bureau of Reclamation. In 2017 almost two months of flows over 11,000 cfs with peak flows over 14,000 cfs eroded enough bank to reactivate an old oxbow channel and wash out the road where it crossed this channel entering the FAS. Just downstream of this point, erosion washed away enough river bank to eliminate about 75 yards of the main access road to the site. No funding was available to complete major repairs at Grant Marsh in 2017. Preliminary survey work was started for building a new section of road around the downstream washout. In 2018 flows in the Bighorn River remained above 13,000 cfs for over 2 weeks increasing road erosion at both sites. Once flows dropped in the Bighorn later in the summer, regional FAS crews were able to get permission from the Corps

of Engineers to reclaim a lot of the road gravel that had washed off the side channel crossing. They used this as a new road base for the road across the now activated side channel. They used existing budgets to purchase additional gravel, geotextile fabric and large rip rap, and constructed a well armored road crossing that should be able to handle high flows in the future. An EA will be completed this winter for building a new road around the second washout, and hopefully funding can be obtained to reopen access to the Grant Marsh boat ramp by later next summer.

One FAS that saw a major improvement this year was Captain Clark FAS located on the Yellowstone River about 50 miles downstream of Billings. This is a large site accessed by a narrow easement road pinned between an active side channel and private land. A lot of time and money has been spent in recent years fighting this side channel and continually moving the road away from the river to maintain vehicle access to the site. By this spring the road had been moved as far as possible towards the private land and at one point the remaining road was just wide enough for a single vehicle to pass. Fortunately, FWP started negotiating with the adjacent landowner after the flood flows in 2011. This year FWP was able to purchase about ½ acre of land that allowed the construction a new road across one corner of his field. This eliminated the pinch point on the old access road and move the whole access road away from the river, which should provide a long-term solution to access issues at this very popular FAS.

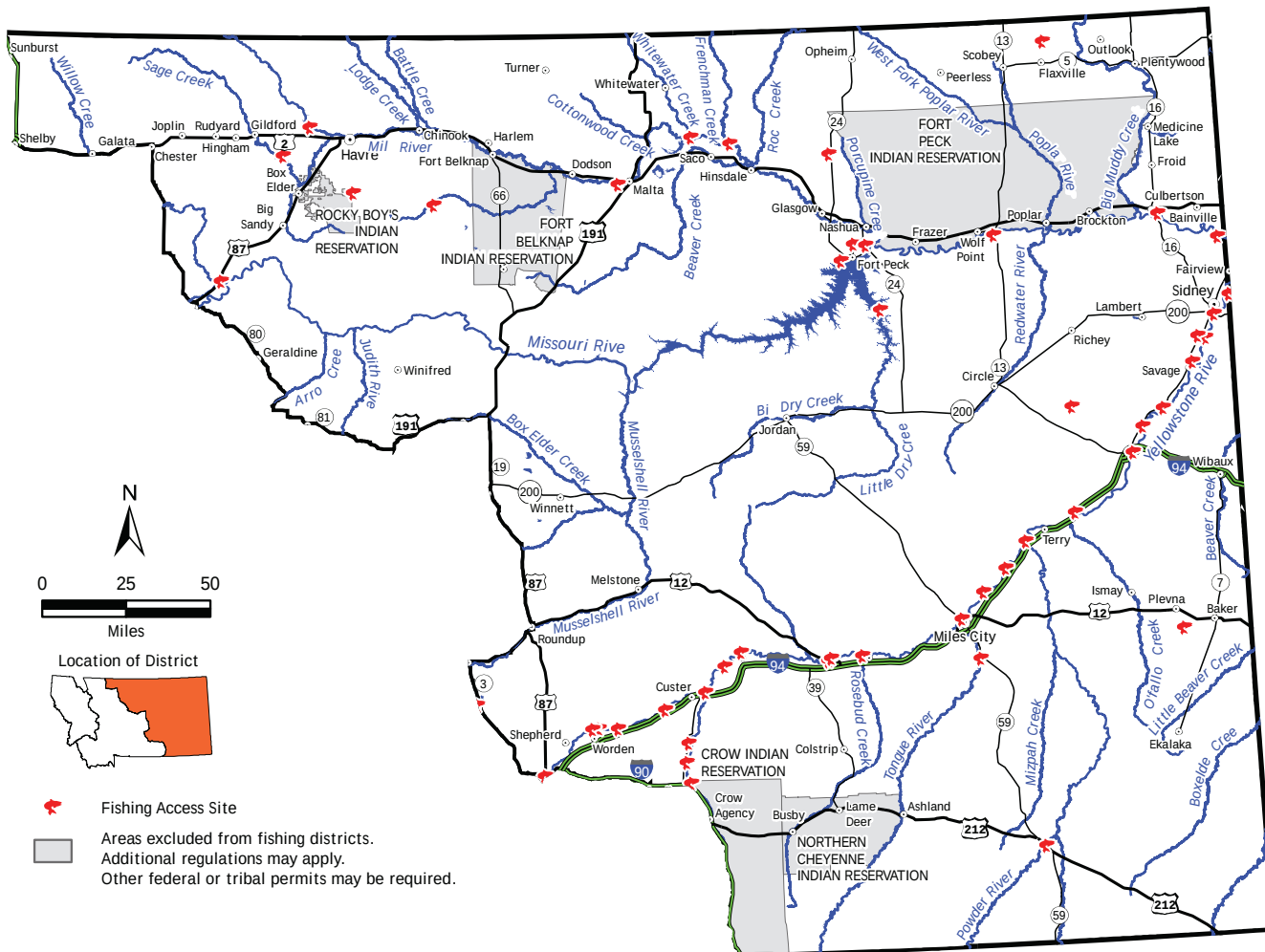
Region 5 will soon have a new FAS on the Yellowstone River thanks to the efforts and support of a variety of partners. This will be a great site for several reasons. It is located near Billings about 7.3 miles downstream from Duck Creek FAS and 6.5 miles upstream of East Bridge FAS, which will open opportunities for a variety of part-day float trips close to town. Since this property is located just downstream of a highway bridge, the river bank in the area is well protected and should provide a great location for a permanent concrete boat ramp which is difficult to find and maintain on the Yellowstone River. This FAS will also be directly across the river from a large county park with a popular urban fishing pond and a large trail system but that lacks good boat access to the river. The highway bridge will connect these two sites.

FWP tried to purchase this 15-acre property in 2014 with the backing of several local groups but could nev-

er get a final commitment from the landowner. In 2016 a settlement was reached with Exxon/Mobil to mitigate losses from the 2011 Silvertip oil spill on the Yellowstone River. This settlement included about 2.4 million dollars to mitigate the recreational use that was lost on the Yellowstone River during the spill and clean-up efforts. FWP working with various partners submitted several joint proposals for this funding with the goal of increasing public access to the Yellowstone River. One of these partners was the Yellowstone River Parks Association, a local NGO that has developed and maintains several important projects in the Billings area that provide recreational and access opportunities for the public. When it appeared Natural Resource Damage (NRD) funds would become available to help develop access along the Yellowstone, YRPA pushed to reopened negotiations with the landowner on this 15-acre property. After lots of hard work and negotiations, and with funding support from the Montana Conservation Trust, YRPA closed the deal and purchased this property. As part of the recreational loss settlement, Our Montana, another local NGO, secured \$160,000 from the NRD program to be used in developing a public FAS on this YRPA property. The Montana Department of Justice who manages the NRD funds agreed to be the contracting agent for this project. They have hired an engineering firm who has been working closely with FWP's Design and Construction Bureau to complete a site development plan for this FAS and put together a bid package for the project. Plans are to get the bid request out this winter, so site construction can begin in the spring. FWP has agreed to provide additional development funds from their NRD settlement if necessary, to ensure this project moves ahead. YRPA will retain ownership of the property and is developing an MOU with FWP so that the FAS portion of this property will be maintained as part of the normal regional FAS maintenance program. YRPA plans additional development on this property such as a picnic area, a trail system and maybe an educational area along the wetland on the property, and they will maintain these features themselves.

This is a very exciting project involving diverse partners and shows what can be accomplished when different groups work together with a common goal. The exciting part is that these same partners are working with the NRD program on several other potential projects which will provide additional public access to the Yellowstone River in the years to come.

Eastern Fishing District



The Eastern Fishing District includes all waters lying east of the Central Fishing District. For the boundary description, see Central Fishing District, page 25.

Note: Roadways that are used as boundaries between the Central and Eastern Fishing Districts are interpreted to be in the Central Fishing District.

For additional information regarding the boundaries of this district, please call the following regional headquarters Monday-Friday 8:00 am. - 5:00 pm.:

Billings.....	406-247-2940
Glasgow.....	406-228-3700
Great Falls.....	406-454-5840
Havre Area Resource Office	406-265-6177
Lewistown Area Office.....	406-538-4658
Miles City	406-234-0900
TTY (Telephone device for the deaf)	406-444-1200

REGION 6 **NORTHEAST MONTANA**

Region 6 Fisheries

Steve Dalbey, Regional Fisheries Program Manager

Hello and welcome to Region 6! What an exciting year for fisheries in Northeast Montana. You will see as you read our updates that some very positive things are happening. We take great pride in providing high quality angling opportunities while dedicating significant time to recovery of the endangered pallid sturgeon and conserving our unique native fishes.

From our popular ponds program to the world class Fort Peck Reservoir fishery to the untapped river fisheries of the Milk and Missouri Rivers, region six is as diverse as any region in the state. Heck, there are even some brook trout to be caught in streams in the Little Rockies and Bearpaw mountains south of Havre. We are fortunate to manage nearly 50 fish species in the region.

We continue to work on habitat and conservation projects across the region. To be successful, these projects require partnerships with the public, state and federal agencies as well as non-government agencies. Landowners are vital partners on nearly all our projects especially those involving private ground. One project that we kicked off this year was an evaluation of fish barriers in south Valley County. This was a cooperative project with the local BLM office. Much like efforts in western Montana for cutthroat trout, these projects look to expand accessible habitat by removing fish barriers on the landscape.

Other projects in the works include, establishing a bonus point system for the paddlefish lottery tag allocation system on the Upper Missouri River (above Ft Peck Dam), working with MSU on paddlefish population analysis and re-writing the 10-year Paddlefish Management Plan (includes all paddlefish popula-

tions in the Montana).

Education plays a key role in our program and each year we dedicate time working with local angling and community groups to host angling education programs. In 2018, the Hooked on Fishing program expanded to Malta and Glasgow classrooms with the goal of growing the program in communities in the eastern part of the region. Marc Kloker, the regional Information Officer, has been instrumental in championing these very successful programs. FWP actively participates in the Becoming an Outdoor Woman workshop and for



Steve Dalbey with a two-year-old "jack" chinook salmon from Fort Peck Reservoir.

the second year, FWP hosted a kayak workshop at the Ft Peck Dredge Cuts. There is talk of expanding on this topic to focus on kayak fishing in 2019.

Montana's native prairie fish in peril?

Allison Stringer, Montana State University Student

Some of Montana's native prairie minnows aren't doing so well. I discovered this while sampling prairie streams across Montana for my master's degree at Montana State University. I was looking for three of Montana's more interesting native minnows: the pearl dace, northern redbelly dace, and northern redbelly × finescale dace hybrid. These three minnows live

in cool, spring-fed prairie streams and often display vibrant ruby-red bellies in early summer, which some of you have probably seen in your minnow traps. But I ran into a problem—they had disappeared from many of the streams where they used to live. In fact, I found that northern redbelly dace have declined up to 67% and pearl dace have declined up to 83% in the last few decades. So what's going on?

Well it turns out an invasive species is probably to blame. We label a non-native species “invasive” when its introduction causes *economic* or *environmental* harm. We've been hearing a lot in the news lately about small aquatic invasive species that hitch a ride on our boats, but some fish are also considered invasive. One fish that fits this definition is the northern pike. Northerns are only native to Montana in the St. Mary River drainage in Glacier National Park and on the Blackfeet Reservation. This means that everywhere else we find pike in Montana they were either legally stocked by FWP or illegally introduced by bucket biologists. In both of these instances, pike have moved into areas where they are having negative impacts to native fish and the ecosystems they live in.

For my master's thesis, I found that native fish don't stand a chance when pike invade. I documented drastic reductions in both the number of individual minnows (biomass) and in the number of native minnow species present (diversity). This is particularly alarming because Montana's prairie streams and rivers are the true stronghold of fish diversity in the state, despite western Montana's trout-centric infamy. These native minnows are a critical part of the ecosystem, and feed reptiles, birds, and bigger fish downstream that we like to catch.

When I tell people about the problem of pike in prairies streams, the most common question people ask me is, “Pike can live in prairie streams? I thought they were a

lake fish?” That's often true in their native habitat, but they are surprisingly adaptable and thrive in many small prairie streams around the state. The next most common question, “What's the biggest one you caught?” Twenty-one inches, by the way.

Finally, people often ask, “So what? Why should I care about pike in prairie streams?” The invasion of pike into prairie streams might matter to you because as the number of minnows decline, fewer are available to trap for recreational anglers. As pike expand and native minnows such as pearl dace become increasingly rare, FWP is faced with some tough decisions; such as limiting minnow trapping, and not allowing pike stocking in drainages with sensitive species like pearl dace. Additionally, these native minnows provide critical nutrients to other species that a lot of people care about, including migratory birds and popular sportfish.

Northern pike will always be an angler favorite, and there are plenty of reservoirs where pike fisheries are man-



Above - Northern redbelly dace; *Phoxinus eos*.

Below - Allison Stringer with a northern pike collected from a prairie stream.

aged successfully. However, my study indicates that we don't want them in our prairie streams where they are having a large impact on prairie fish populations and the broader ecosystem. Our job as fish biologists is to think about how to balance recreational and native fisheries, and this probably means limiting pike stocking in sensitive areas in the future.

Fort Peck Reservoir

Heath Headley, Fisheries Biologist

Fort Peck Reservoir saw a notable increase in water levels during 2018. Reservoir elevations rose approximately 14 feet from March into July due to above average snow pack conditions in the mountains as well snowmelt on the plains. As a result, a large amount of shoreline vegetation was flooded in 2018 which provided additional spawning and rearing habitat for some fish species. Water levels have decreased since the summer and are forecasted to decrease into the winter months to prepare for runoff during the 2019 season. All boat ramps should be usable again in 2019 barring any unforeseen circumstances.

The walleye egg-taking effort in the upper Big Dry Arm of Fort Peck Reservoir proved challenging in 2018. A long winter led to one of the latest starts since the walleye trap netting and egg-taking program began. Fisheries and hatchery crews were unable to start spawning operations until April 24th due to ice that covered much of the upper Big Dry Arm. For reference, walleye

spawning activity typically peaks in mid-April on Fort Peck Reservoir. Because of the late start, some walleye spawned on their own making it difficult to obtain enough green or ripe females (carrying eggs) to reach our egg-take goal. A total of only 22 million eggs were collected which was short of the 50 million egg goal. This effort still resulted in 811,266 walleye fingerlings that were released back into Fort Peck Reservoir in 2018. While this was fewer fingerlings stocked than in the past, conditions appear very favorable for survival of these stocked walleye along with any that may have reproduced on their own.

The walleye trap netting and egg-taking operation

requires a strong volunteer program in order to be successful. A total of 66 individuals assisted with this year's program. If anyone is interested in assisting with the walleye egg-take in April, please call (406) 526-3471 to join the other volunteers that participate annually. It's a great way to learn more about the walleye fishery, see large walleye, and be part of the statewide egg-take that benefits other Montana walleye fisheries.

Annual gill netting surveys indicated walleye continued to be the most abundant species captured in 2018. Relative abundance of walleye was 4.7 per net in 2018 which is still above the long-term average of 3.7 per net. Walleye in the 12 to 15-inch range were most abundant but there were also good numbers of fish captured

in the 20 to 25-inch range from the high-water years of 2010 and 2011. Walleye were most abundant from the dam area upstream to the Hell Creek area of the reservoir during the July-August sampling. Unlike walleye, northern pike relative abundance is slightly below the long-term average. This is attributed to decreased spawning and rearing habitat unlike the high-water years of 2009-2012. In 2018, the average size of pike sampled was 27.1 inches and 5 pounds.



Young volunteer holding a 25" walleye from the walleye spawning operation.

Anglers can also take advantage of two other overlooked species that

have been doing well over the last several years. Smallmouth bass populations continue to expand throughout the reservoir as indicated by our sampling surveys. Anglers should expect smallmouth to average around 13 inches but also have a shot at others approaching 20 inches. Best locations during summer for smallmouth bass are the Big Dry Arm and upstream from Bone Trail. Another overlooked angling opportunity is channel catfish. Channel catfish are typically one of the most abundant game fish captured during annual gill netting surveys especially in the upper portion of the reservoir. In 2018, average size of channel catfish sampled was 17.8 inches and 2.4 pounds.



Angler with smaller, two-year old salmon caught downrigging.

Forage fish surveys on Fort Peck Reservoir indicated positive results in 2018. Shoreline forage fish (yellow perch, crappie, spottail shiners, and emerald shiners) abundance increased slightly in 2018 and are near long-term averages thanks to newly flooded shoreline vegetation which provided additional spawning/rearing habitat. This is encouraging because these species comprise a bulk of the food for smaller walleye and other predatory fish in Fort Peck Reservoir. Coldwater forage fish (cisco) netting results in September indicated a large group of young cisco (average 5 inches) as well as good numbers of older, adult cisco (average 7-10 inches). While this is great news for the medium to larger walleye, northern pike, chinook salmon, and lake trout, it may make things a bit more difficult for anglers. Anglers may have to change tactics in 2019 by fishing deeper as summer progresses when water tem-

peratures warm. Warmer temperatures will force cisco to head to deeper, cooler water where larger predatory fish will pursue this abundant food source.

The high abundance of cisco has also benefited the coldwater fishery that Fort Peck Reservoir has to offer. The increase in cisco abundance over the last few years has led to excellent growth and improved survival of stocked chinook salmon by providing an excellent forage base and buffering predation rates from other piscivorous fishes. Anglers had some success downrigging earlier in the summer and caught primarily younger, smaller-sized salmon that averaged close to 5 pounds. FWP fisheries and hatchery staff observed a similar trend during collection efforts in the fall by capturing good numbers of 2-year old males, but very few females. Due to the lack of mature female salmon, fisheries and hatchery staff only collected 110,979 eggs. Both North and South Dakota will be able to supply some additional salmon eggs to help reach stocking goals in 2019. There's a chance that anglers may catch some older, larger salmon in 2018, but it will still be difficult to replicate the high catch rates experienced in 2016 by some anglers.

Anglers can also take advantage of the lake trout fishery if the chinook salmon aren't cooperating. Compared to chinook salmon, lake trout have a tendency to be less finicky and can be caught throughout much of the fishing season with the proper gear. Most lake trout caught continue to average around seven pounds, but anglers have a shot at a fish approaching 15 pounds. Whichever species anglers decide to target, they will have a good chance at catching a quality-sized fish!



Three different age groups of cisco sampled in 2018.

Fresno Reservoir

Cody Nagel, Havre Area Fisheries Biologist

Severe drought conditions persisted along the Hi-Line throughout the spring and summer of 2017. The demands for water were high and Fresno was drawn down approximately 33 feet (13% of storage capacity) by mid-August. Near record snowfall during the 2017/2018 winter provided plenty of spring runoff to re-fill Fresno. Reservoir pool levels stayed above average from May through June, creating good spawning conditions for most species. Summer seining efforts identified good natural reproduction for walleye, black crappie, and spottail shiners.



Above: Lance Breen with a Memorable Fresno Walleye. Right: Young of the year walleye captured at Fresno Reservoir.



have flooded terrestrial vegetation, creating optimal spawning conditions for yellow perch. For the last eight years FWP has been stocking adult pre-spawn yellow perch in April to help boost reproductive success and perch abundance under these ideal water conditions.

Since 2017, FWP has partnered with the Fresno Chapter of Walleyes Unlimited to increase yellow perch spawning habitat utilizing recycled Christmas trees. Approximately 200+ trees have been donated and used to construct “spawning reefs” at five locations in the Kremlin Bay area. All structures were placed in 6-15 feet of water and checked to verify use. All reefs checked indicate yellow perch are depositing their egg skeins on the structures, suggesting yellow perch utilize these spawning structures when available. Over

the last ten years FWP has documented excellent yellow perch and black crappie reproductive success; yet the ability of these two species to survive long enough

to recruit to adult stages remains a challenge.

Standard fall gill net surveys revealed walleye relative abundance has remained stable at 15.6 walleye/net. Walleye abundance is primarily influenced by relatively stable reservoir levels, excellent spawning conditions, and good natural reproduction. Fresno contains multiple age classes of walleye, with good densities of 13-20-inch fish (3-5-year-old). Walleye condition (plumpness) observed in 2018 was the highest seen since 2012, suggesting favorable forage conditions currently exist in Fresno. Fishing opportunities for walleye should once again be excellent in 2019. Northern pike relative abundance increased to 4.2 pike/net, the majority of these fish range from 20-26 inches.

Yellow perch abundance has remained low since 2011 and there is concern pertaining to the long-term contribution of the primary forage fish in Fresno Reservoir. Above average pool elevations during April and May

Fall gill net surveys revealed adult yellow perch (1.66 yellow perch/net) relative abundance remains low. However, black crappie relative abundance was the second highest on record at 2.83 black crappie/net. The current black crappie population is comprised of young fish (< 4-inches) and are currently providing the primary forage for the walleye and northern pike populations. Although successful spawning has been documented for forage species such as yellow perch and black crappie, low adult abundances are an indication of high predator densities. The fishery in Fresno is highly dependent on water conditions; water levels greatly impact the reproduction, survival, and condition of forage and sport fish throughout the reservoir.

Missouri River Downstream of Fort Peck Dam

Tyler Haddix, Fisheries Biologist

Pallid sturgeon

2018 was a very interesting year for the Missouri River from Fort Peck Dam to the North Dakota border. During the spring, river discharge was much higher than normal due to excellent Milk River flows and higher than normal releases from Fort Peck Dam. A peak of over 26,000 cfs (cubic feet per second) occurred at the beginning of May, with approximately 46% coming from the Milk River. The Milk River then began dropping, which in turn dropped discharge of the Missouri River until May 10th. At about that time, the U.S. Army Corps of Engineers began to spill water over the Fort Peck Dam Spillway, which created flows in the Missouri River of about 20,000 cfs for most of June and flows continued above 15,000 cfs far into September.

This year's flows, which were higher than what is typically observed in the Missouri River, lead to a very positive response in the endangered pallid sturgeon population. During May, when Missouri River flows were aided by good Milk River discharge, several radio-tagged adult pallid sturgeon started migrating up the Missouri River from below the confluence with the Yellowstone River. Typically, flows from Ft Peck Dam are flat in the spring (no increase in flows as would happen if the dam was not in place) and as a result, very few pallid sturgeon migrate up the Missouri due to this absence of "trigger flows". This spring FWP crews were able to find, catch and take egg samples from three adult female pallid sturgeon. The egg samples were sent to the U.S Fish and Wildlife Services Bozeman Fish Technology Center to be examined. After assessing the eggs, all three females were deemed to be reproductively ready to spawn this year.

Around the end of June, these three fish started migrating downstream and biologists felt like they may exit



A 1997 hatchery origin adult female pallid sturgeon that was using the Missouri River near Fort Peck Dam. The flows observed on the Missouri River in 2018 attracted adult Pallid sturgeon up the Missouri River.

the Missouri River in Montana. While one female did exit the river and subsequently spawn in the lower Yellowstone River, the other two remained in the Missouri River throughout the spawning season (late June through mid-July). While it is unclear if these two fish spawned, it is one of only two times with the other being 2011 that biologists have documented gravid ("ready to spawn") females in the Missouri River during the spawning window. Only time will tell if biologists capture progeny

from these two fish (which can be done through genetic testing).

This long upstream migration of spawning condition pallid sturgeon is so important due to their larval life stage. When pallid sturgeon eggs hatch, they are called free embryos, which drift at the mercy of the current for many days as they absorb their yolk sacks. If pallid sturgeon are spawning too close to the headwaters of Lake Sakakawea, then these free-embryos will drift into the reservoir and settle out in the muck and mud of the headwaters delta and likely perish. However, if the adults can migrate a great distance upstream to spawn, then the free embryos may have enough distance to drift before they become able to swim and feed on their own. Research has shown that if pallid sturgeon are able to spawn near Fort Peck Dam, then at least a portion of their free embryos would have enough drift distance (nearly 200 river miles) to survive.

In addition to monitoring adult pallid sturgeon using radio telemetry, FWP has been monitoring sturgeon and paddlefish production in the Missouri River for the past 18 years. This is done using ichthyoplankton (free drifting fish plankton) nets that are placed near the bottom

of the river and capture any drifting fish embryos. By doing this, we can relate different water conditions in the system to sturgeon and paddlefish spawning success. When we catch these tiny creatures, we don't know right away if they are sturgeon, either shovelnose or pallids or if they are paddlefish, since all look alike at this life stage. We therefore preserve the free embryos in alcohol and send them in for genetic testing. With the higher than normal flows in the Missouri River during 2018, FWP collected more of these *Acipenseriforme* (sturgeon and paddlefish) free embryos than ever before.

Just because there is production in a species, doesn't necessarily mean that a good year class will be formed. To understand the relationship between production (embryos) and young-of-the-year fish (YOY), FWP also uses a benthic trawl to collect YOY Sturgeon in the lower parts of the Missouri River in Montana and North Dakota. The benthic trawl is pulled along the bottom of the river where YOY sturgeon are rearing in the settling areas (lower river). It appears that a lot of those free embryos did make it to the YOY life stage, since we witnessed the largest number of YOY sturgeon captured in 18 years of sampling. Our goal is to determine if any endangered pallid sturgeon were produced, but the data we gather is excellent in understanding shovelnose sturgeon recruitment as well. All these little fish are again put in alcohol and sent in for genetic testing to distinguish pallid and shovelnose sturgeon from one another. So far, in 17 years, no naturally produced YOY pallid sturgeon have been captured. We are hoping our genetics data tells us a different story in 2018, but we won't know until the late winter when the genetics results come back from the lab.

Missouri River Game Fish

With the high water in the Milk and Missouri Rivers during 2018, Walleye and Sauger anglers enjoyed an excellent year of fishing. During the early spring when

the Milk River was running high, the mouth of the Milk River experienced some of its highest fishing pressure FWP has observed since 2011. Later in the spring, when the Milk River receded, the Fort Peck Dam Spillway began flowing and anglers soon switched to fishing the spillway channel and plunge pool. Walleye were most

likely being drawn upstream to the Spillway with the higher flows and being entrained over the Spillway from Fort Peck Reservoir. This combination provided excellent fishing throughout the summer into the early fall months.

The lower Missouri River near Culbertson had somewhat of an off year for walleye and sauger, since the higher flows muddied up the river more than normal and created high velocities in normal good fishing holes. In addition, the high water hindered angler's ability to put boats in the river since FWP's Snowden Bridge Fishing Access

site (FAS) was flooded and the Culbertson FAS ramp was also made unusable. The silver lining is that these higher flows likely lead to a great production year for both sauger and walleye, although that won't be known until these fish get a little bigger and are either caught by anglers or FWP's biologists nets.

Missouri River Dredge Cuts

The Missouri River Dredge Cuts host a slew of both native and non-native fishes, which provide various fishing opportunities. Fishing can easily be done from shore or in a boat and the waters are often calmer on windy days than Fort Peck Reservoir, which is situated just upstream of the Fort Peck Dam.

The Dredge Cuts again provided a quality fishery for walleye, sauger, northern pike and channel catfish in 2018. FWP's data suggest that walleye in the Dredge Cuts are both plentiful and individuals are very robust. While walleye numbers have been relatively high in the Dredge Cuts for the past few years, Sauger numbers have been slightly depressed. Channel catfish appear to be an underutilized species by anglers in the Dredge Cuts, since very few people are targeting them, and data indicate that they are very plentiful.



Young-Of-The-Year Sturgeon and a Paddlefish captured using the benthic trawl. FWP monitors the recruitment of Sturgeon to this young life stage.

Northeast Region 6 Waters

Tyler Haddix, Fisheries Biologist

Northeast Montana Prairie Ponds

With the severe drought of 2017 and the extreme winter of 2017-2018 many prairie ponds which FWP stocks with rainbow trout likely experienced winter kills. Several reports from landowners in the area indicated that few trout survived the winter. However, these ponds are stocked on an annual basis and were again stocked during the late spring of 2018. Water levels going into the 2018-19 winter are much better than the previous year, which should contribute to higher winter survival of trout populations.

Redwater River

Until the spring of 2017, fish migrating out of the Missouri River and up the Redwater River in northern McCone County found themselves

between a rock and hard place, or in this case a perched culvert and a concrete barrier. The Nickwall Road crossing over the Redwater River, which is situated approximately 1.25 mile upstream from the Redwater's confluence with the Missouri River was nearly a complete impediment for upstream fish migration. Tributaries such as the Redwater River are important to numerous native species during parts of their life history. Within the Redwater, a few species that would typically migrate upstream and be blocked by the structure included western silvery minnows, flathead chubs, goldeye, smallmouth buffalo, largemouth buffalo, river carpsucker, channel catfish,

stonecat, sauger and longnose sucker.

To solve this problem, Montana Fish, Wildlife and Parks in collaboration with the Bureau of Land Management and U.S. Fish and Wildlife Service tore out the old structure which consisted of perched culverts and a concrete slab and replaced it with fish friendly concrete box culverts. This project was important in that it opened an additional 23.75 miles of the Redwater River to fish migrating out of the Missouri River.

Upper Missouri River Paddlefish

Cody Nagel, Havre Area Fisheries Biologist

A valuable recreational snag fishery occurs each year for paddlefish above Fort Peck Reservoir to Fort Benton (White Tag). The paddlefish season on the Upper Missouri River runs from May 1st-June 15th. Regulations require anglers wanting to harvest a paddlefish to apply and draw (via lottery; up to a party of five) for a tag that will allow for the harvest of one paddlefish. Unsuccessful applicants and anglers who only want to snag and release are limited to snag and release fishing on the Upper Missouri River only. Applications will be made available in early March, with the deadline to apply being March 30th.

In 2018, 196 paddlefish were mandatorily reported as harvested on the Upper Missouri River (1,000 harvest tags were



Nickwall Crossing on the Redwater River right after fish friendly box culverts replaced the old structure.



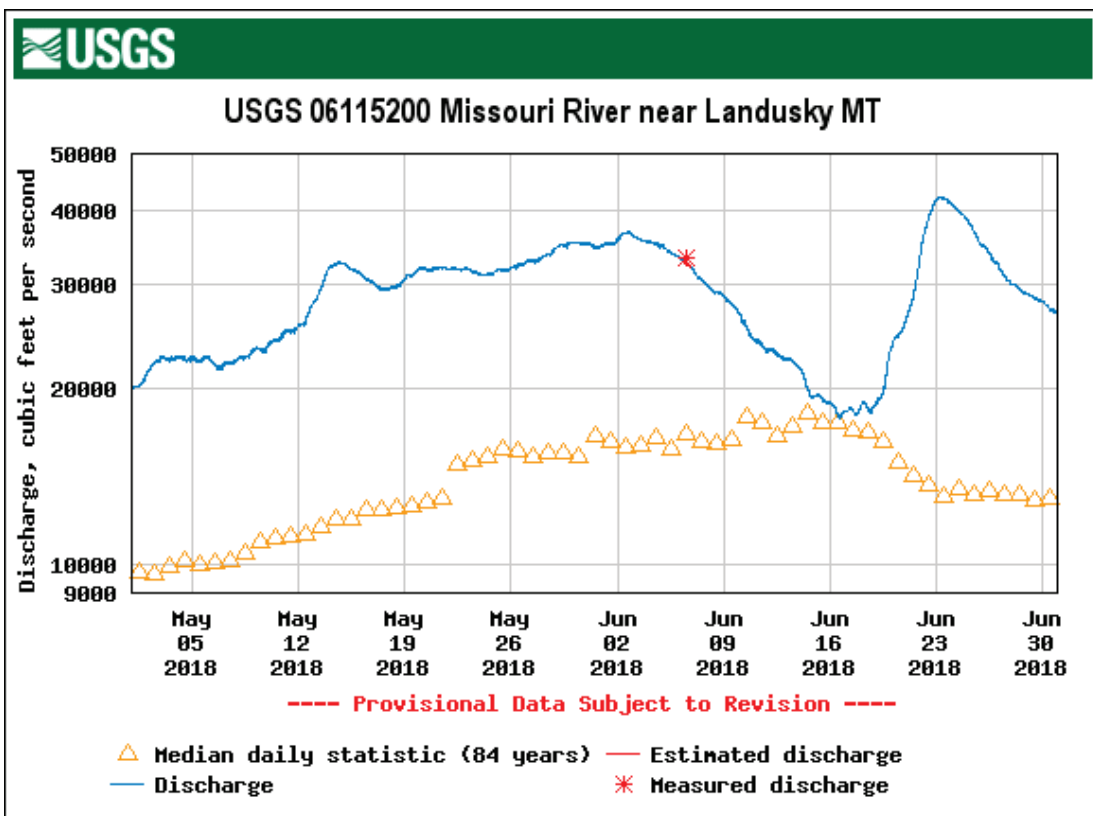
Nickwall Crossing on the Redwater River before fish passage project was completed.

issued in the lottery). Females comprised 51% of the harvest and harvest was spread throughout the six-week season, with the majority of harvest occurring during the first three weeks. In recent years, harvest of Fort Peck paddlefish has varied with annual river discharges but has typically ranged between 350 and 500 fish. Historically, fishermen have caught female paddlefish weighing over 100 lbs and up to 60 years old. Currently, the adult population is comprised of fish between 12 and 40 years old.

In 2018, good snowpack conditions in the Missouri River watershed

led to higher than average river flows immediately following ice-off. The high flows triggered a strong paddlefish migration upstream and allowed the paddlefish to disperse throughout the 100+ miles of Missouri River upstream from Fort Peck Reservoir. The wide dispersal of paddlefish made snagging success very difficult in 2018. Flows remained above 20,000 cfs throughout the season (May 1-June 15), with peak flow occurring on June 2nd (~36,000 cfs). Flows were 10,000-20,000 cfs above the long-term average and resulted in excellent spawning conditions overall and young-of-year visual surveys conducted in August confirmed this. The long-term sustainability of this population remains good, as reproductive success was also above average in 2008 and 2010, with an exceptional year-class observed in 2011. Anglers can expect these fish to make their first spawning run up the Missouri River in 3-11 years. Males mature around age 10 and females around age 15.

FWP continues to annually tag paddlefish, and we encourage anglers to return tags with information on location and size of fish harvested to the Havre Area Resource Office. This information allows biologists to determine survival, harvest, and growth rates of paddlefish in the Upper Missouri River. The angler will also get information back pertaining to the location, size, and date the paddlefish was originally tagged. The paddlefish population remains stable and anglers should expect another great spring “run” in 2018.



USGS discharge at Landusky Gauge from May1 to June 15, 2018.



Havre Area Ponds

Cody Nagel, Havre Area Fisheries Biologist

Fish, Wildlife, and Parks manages approximately 100 small ponds and reservoirs located on both public and private lands throughout Hill, Blaine, and Phillips Counties. The fisheries are very diverse, with some ponds being managed as rainbow or brook trout fisheries, and others as warm water fisheries that could contain bluegill, yellow perch, largemouth bass, northern pike, walleye, tiger muskie, black crappie, or channel catfish.

Heavy snowfall and prolonged winter conditions in 2017/2018 led to winterkills at several ponds in Blaine and Phillips County. FWP responded quickly to the winterkills and many of these ponds have been re-stocked with fish. Water conditions have remained good to excellent throughout most of the region and have contributed to some excellent fishing opportunities.

Rainbow trout- Trout growth in these prairie ponds is very good, and reports of trout up to four pounds are common. Reservoirs such as Bearpaw Lake, Beaver Creek, Anderson, H.C. Kuhr, Choteau, Sentinel, King, Plutz, Current, Hump, Flintstone, Grasshopper, Faber, North and South Polly, and North Faber have continued to produce both quantity and quality rainbow trout.

Northern pike- Several quality pike fisheries exist in the area. Though typically not known for trophy pike, many of these smaller impoundments often have high densities of 3-5 pound fish, with good catch rates reported. Reservoirs such as Baileys, Beaver Creek Reservoir, Dry Fork, PR 161, Ester, McChesney, and Wildhorse all contain good pike populations.

Walleye- Walleye typically exhibit fast growth rates in these smaller impoundments but rarely achieve trophy status. Many of the walleye fisheries contain a lot of fish in the 2-3 pound range (16-20 inches). Reservoirs such as Baileys, Beaver Creek, Dry Fork, Anita, Ester, and Cow Creek all contain good walleye fisheries.

Bass- This area contains many largemouth bass fisheries, with 1-3 pound fish common. Reservoirs such as Dry Fork, North Faber, Salmo, Lark, PR 054, PR 022, Doucette, Cole Ponds, Sagebrush, Taint, and Wapiti all contain good largemouth bass populations. There are also good angling opportunities for smallmouth bass at Bearpaw Lake and Beaver Creek Reservoir.



Hooked on Fishing event at Bailey's Reservoir FAS.



Largemouth bass from Reser Reservoir.



Dead bluegill that winterkilled as a result of severe winter conditions in 2017 / 2018.

Yellow perch- Good yellow perch fisheries exist in Anita, Cow Creek, Baileys, Ester, McChesney and Beaver Creek Reservoirs. Most of these fisheries contain good numbers of 6-8 inch fish, with perch up to 13 inches present as well.

Black crappie- Opportunities exist at Baileys, North Polly, Anita, Choteau, McChesney, Ester, Hump and Flintstone Reservoirs. Black crappie in these impoundments average 7-10 inches but fish over 12 inches is always a possibility.

Bluegill- Opportunities exist at Dons, BR 047, North Faber, April, Flintstone, Taint, Lark, Sagebrush, PR 016, Wapiti, and Karsten Coulee Reservoirs. Bluegill in these impoundments typically average 6-8 inches but fish over 10 inches are also common.

Anglers looking to experience the excellent fishing some of these ponds have to offer are encouraged to stop by the Havre Area Resource office and pick up the latest version of the Region 6 pond guide or download it from the Region 6 webpage located on the FWP website (<http://fwp.mt.gov/regions/r6/>). The fisheries on some of these ponds are greatly affected by water levels and winter severity. Anglers should be aware that landowner permission may be required to access some of these ponds and should plan accordingly.

Region 6 Fishing Access Site Update

Dave Fuller, Fishing Access Site Coordinator

There have been lots of changes here in Region 6. We have constructed a new picnic shelter at Bailey's Reservoir. This is a popular spot for kids fishing events in the Havre area. In addition, we added new fire rings and more picnic tables make your camping experience more enjoyable.

If you are making your way to the Duck Creek area on Fort Peck Reservoir, you will see some improvements to the fishing access site (FAS). The parking area and entrance road were widened creating additional parking for boaters and more efficient traffic flow on busy



Bearpaw Lake FAS south of Havre.

weekends. Additionally, a section above the boat ramp was paved enhancing handicap-access to latrines, side-walks and parking. The newly paved apron above the boat ramp will limit the amount of gravel that ends up on the boat ramp making for safer boat launching.

Like the rest of the state, we continue to struggle with maintenance of boat ramps at sites on big rivers. Flooding, deposition and scouring are all problems we face on the Missouri River that wreak havoc on our ramps, particularly at the Culbertson and Snowden FAS. We are currently developing plans to improve the access at these sites. Special thanks to the Wolf Point Chapter of Walleye's Unlimited that funded a rip-rap project on the boat ramp at the Lewis and Clark site on the Missouri River to ensure that the ramp remains protected.

Fishing access sites are visited by hundreds of thousands of people each year. Many use these sites for other outdoor opportunities other than fishing such as; hunting, kayaking, picnicking, camping, bird watching, and swimming to name a few. In fact, at the Lewis and Clark FAS near Wolf Point, local groups and business' have purchased equipment and established a frisbee golf course. We also worked with Beaver Creek Park and Havre Trails to develop a nature trail that begins in the Bearpaw FAS. Visit one of our fishing access sites throughout the state and let the outside get in you.

Nelson Reservoir

Cody Nagel, Havre Area Fisheries Biologist

Nelson Reservoir has experienced two significant drawdowns in the last three years. In 2016, Nelson water levels were reduced approximately 16 feet to complete a safety of dams project to the dike and levee infrastructure. Water levels improved the following spring but were quickly reduced approximately 12 feet due to extreme drought conditions during the spring/summer of 2017. The unstable water conditions made angler access difficult at times, however the reduced water levels allowed shoreline vegetation (grasses/trees) to establish and grow. It was only a matter of time for this new near-shore habitat to become inundated and create optimal spawning and rearing habitat for the Nelson fish community. Water conditions improved greatly in 2018, following a winter that dropped near record amounts of snow and extreme flooding occurred along the Milk River in the spring.

Summer seining efforts revealed spawning conditions for walleye, smallmouth bass, spottail shiner and yellow perch was above average in 2018. Annual fall gill net surveys suggest good adult abundances of all game fish found in Nelson. Walleye relative abundance was the second highest documented in 25 years at 19 walleye/net, and remains well above the long-term average of 13 walleye/net. The walleye population is comprised mostly of 13-20-inch fish. Northern pike relative abundance has increased to 3 pike/net, the current pike population is comprised of younger fish (8-20 inches). Yellow perch densities in Nelson have been high since



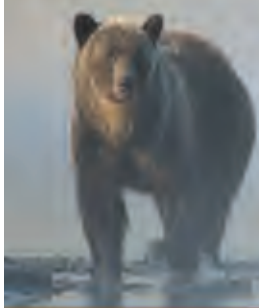
Nelson shoreline vegetation established as a result of two consecutive years of low water levels.

2011, following historic year-classes produced from 2009-2011. Yellow perch relative abundances peaked in 2011 at 37.1 perch/net, and slowly decreased since. In 2018, yellow perch relative abundance significantly increased to 36.5 perch/net. The current yellow perch population is comprised mostly of 6-11 inch fish and will continue to provide good forage and angling opportunities.

It was unclear how the fish community would respond following two consecutive years of reduced water levels in Nelson Reservoir. Based on 2018 surveys, the fishery at Nelson is looking very strong. Most of the littoral vegetation remains and will continue to provide critical spawning habitat if water levels remain high.

RECREATING SAFELY IN BEAR COUNTRY

Reminders for anglers:



- ▶ If you are cleaning fish, do not leave fish entrails on shorelines of lakes and streams.
- ▶ Sink entrails in deep water.
- ▶ If you do not properly dispose of entrails, you increase danger to yourself and to the next person to use the area.
- ▶ Inquire about recent bear activity in the area.
- ▶ Carry and know how to use bear spray.
- ▶ Stay in groups of three or more.

fwp.mt.gov



REGION 7 **SOUTHEAST MONTANA**

Yellowstone River Paddlefish

Caleb Bollman, Fisheries Biologist

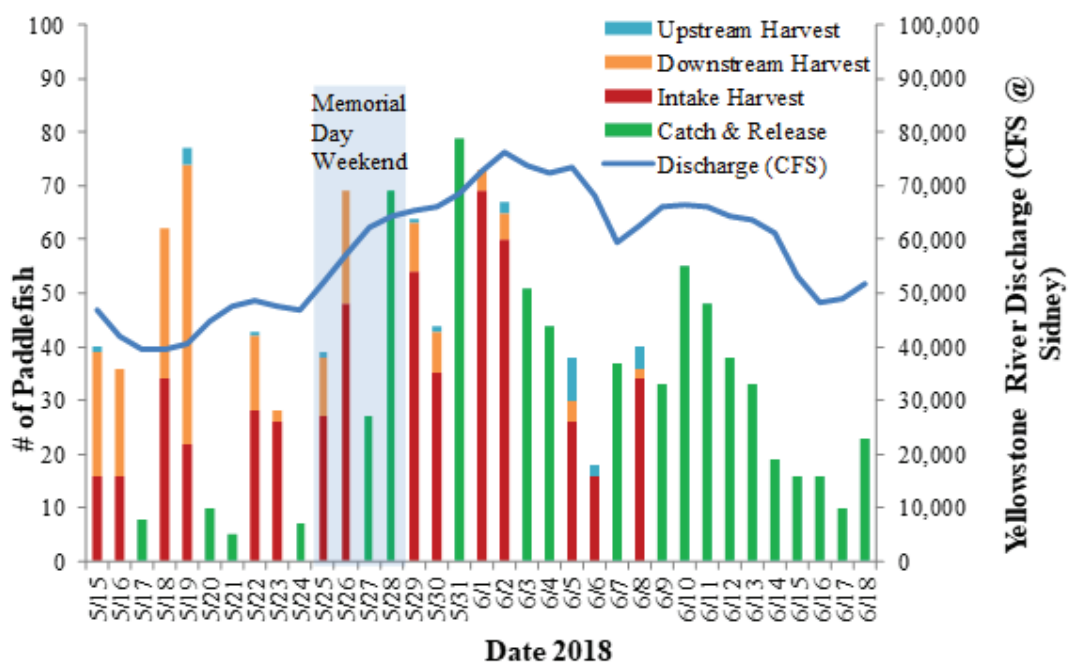
Each spring paddlefish migrate upstream out of the headwaters of Lake Sakakawea with rising river discharge to reach river spawning grounds. Above average river discharge led to early migration and paddlefish were first observed at Intake Fishing Access Site on May 2, 2018, well before the season opener on May 15th. The high-water level made snagging more difficult than usual and harvest was slow and steady. Harvest was allowed for 15 days with an estimated average harvest rate of 50 paddlefish per day. Catch and release fishing at Intake Fishing Access Site lasted until June 18 with an average of 32 paddlefish landed per day.

Paddlefish are a long-lived species of fish that make their first spawning run at 7 to 15 years old (7 for males and 15 for females). For harvest to be sustainable, data must indicate that the Paddlefish population continues to recruit new fish to replace harvested fish and the population should have representation across a wide range of year classes. While population estimates have been fairly stable, concern has been growing as year classes since 1995 have been recruiting low numbers of paddlefish to the adult population. Fall trend surveys on Lake Sakakawea found few young of the year Paddlefish in 2018. The 1995 year class of Paddlefish was an exceptionally strong year class and their abundance has been buffering the harvest of older fish for the last 10 years. On a positive note we are now seeing young males from the 2011 year class recruit to the fishery in a way that shows early signs that they may be an above average year class.

Other Yellowstone River Fishing Opportunities

Caleb Bollman, Fisheries Biologist

The lower Yellowstone continues to provide exceptional angling opportunity for a variety of warm-water fish. Anglers can target game species including channel catfish, sauger, walleye, shovelnose sturgeon, smallmouth bass, and northern pike. The natural hydrograph of the Yellowstone River influences when individual species are catchable, but there is opportunity throughout the open water season. After ice out, in the spring (March) and before high water (June) from mountain snow melt anglers target walleye, sauger, and smallmouth bass. Water clarity determines the duration of the spring fish-



ing window for these sight feeding species. Sauger are more abundant downstream of the mouth of the Powder River, but average size of individuals increases as you go upstream. The Yellowstone offers trophy potential for Walleye with 10+ pound fish sampled in the reach of river from Miles City to Hysham. Smallmouth bass are more abundant in the less turbid reach of river upstream of Miles City. April and May are excellent months to target shovelnose sturgeon and if done while water temperatures are cooler anglers targeting sturgeon with worms will lose less bait to small catfish. On May 15th the lower Yellowstone River paddlefish season kicks off. Consider a family camping/fishing trip to one of the Yellowstone River fishing access sites or wildlife management areas to bait fish for catfish and shovel-

nose sturgeon and participate in the daddelfish snagging season. Being less dependent on water clarity to sight feed channel catfish can be targeted with success almost anytime during the open water season. Channel catfish are the most abundant sport fish encountered in the lower Yellowstone River where 6 to 8 pound fish are common and 10 to 15 pound fish are observed in surveys regularly. Worms, shrimp, and minnows can be used to catch smaller catfish while larger fish are targeted best using large chunks of fresh cut bait (Goldeye and White Sucker). Goldeye will bite on live bait, soft plastics, and lures and can be entertaining using ultra light tackle or fly-fishing gear. Beginning in August anglers can again be found casting crankbaits, jigging, and trolling for sauger, walleye, and smallmouth bass. Depending on water clarity the fall fishing window can extend until ice up usually occurring sometime in November. Late fall can be an excellent time for the serious fisherman targeting sauger and walleye.

Tongue River Reservoir

Caleb Bollman, Fisheries Biologist

The 2018 fall survey at Tongue River Reservoir returned lower counts of adult crappie than observed in the previous 2 surveys but abundance is similar to the 2015 survey. Fishing for crappie was tough for much of the 2018 season according to anglers with success dependent on finding a school at peak feeding times like the last hour of the day. Walleye counts were also down from last year but remain near the historical average. In contrast to the crappie bite, walleye anglers reported pretty good fishing in 2018. Northern pike have been naturally reproducing since the dam rebuild created suitable spawning habitat. Their abundances remain low compared to walleye and crappie but offer anglers' additional opportunity. Bass continue to offer quality angling opportunity on the reservoir and a tailrace trout fishery in the Tongue River below the dam for rainbow and brown trout provides a diversity of angling opportunity that is hard to find in just one location.

Expect fishing in 2019 to be better for crappie as small-

er fish recruit to catchable size. Expect walleye fishing to be similar to the 2018 season. An angler fishing from the bank or in a boat is likely to catch a mixed bag as Tongue River Reservoir supports populations of black crappie, white crappie, walleye, smallmouth bass, largemouth bass, northern pike, channel catfish, pumpkinseed, sunfish, and yellow perch.

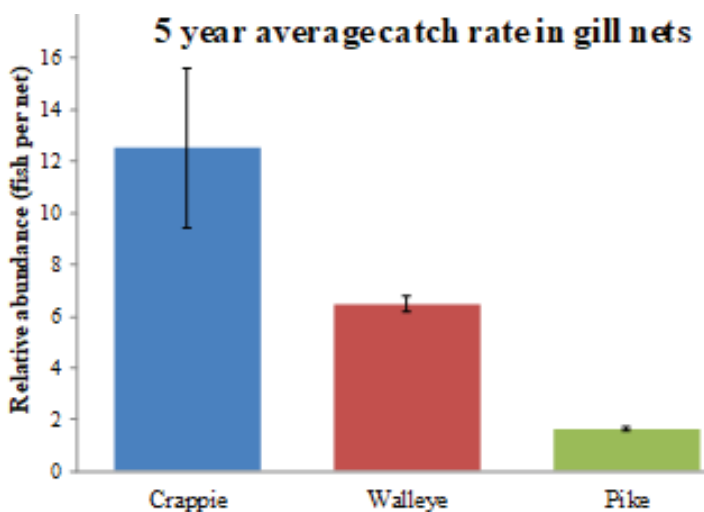
Lower Yellowstone River Native Species Telemetry

Mat Rugg, Fisheries Biologist

Montana Fish, Wildlife & Parks (FWP) fisheries crews partnered with Bureau of Reclamation (BOR) in 2018 for a fourth year to complete a preliminary study assessing the movements of several native fish species in the lower Yellowstone River. Specifically, the agencies were interested in determining the current effects of Intake Diversion Dam (Intake) on the movements of Sauger, Shovelnose Sturgeon, Pallid Sturgeon, Blue Sucker, and Paddlefish. These species all require long, un-impaired river reaches to fulfill all their life-history stages. Currently, passage upstream or downstream of Intake can only be achieved by fish swimming over a wooden crib and boulder field dam or through a natural side-channel that flows around the dam during times of high river discharge. However, the U.S Army Corps of

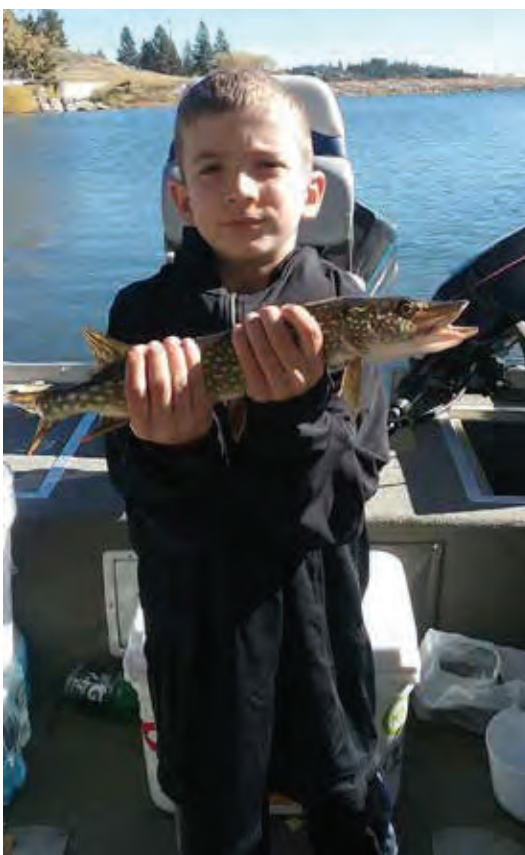
Engineers (USACE) and BOR have proposed the construction of a fish-bypass project designed to improve passage for the endangered Pallid Sturgeon and other native species at Intake. After a long legal battle between the federal agencies and environmental groups, construction is projected to begin Fall of 2018. The existing dam and natural-

side channel, and passage of all Yellowstone River fish species, will be altered if the project is completed. Thus, it was prudent to expand the current understanding of fish movements pre-construction to provide a baseline of fish passage to which post-construction monitoring could be compared to.



Fish were captured in the river reach immediately downstream of Intake Diversion Dam (where passage could be impeded by the dam), as well as the reach just upstream of Glendive (where no physical passage barriers exist). Telemetry transmitters were surgically placed into the abdominal cavity of individuals, and their movements were monitored weekly using boat-mounted telemetry receivers and continuously using ground-based telemetry receivers from April through October.

Biologists were able to document the movement, or lack thereof, of the above listed species at Intake over the past 4 years. Yellowstone River flows have varied across the 4 years of this study, and expectedly, fish passage at the dam also has differed between years for most species. Roughly 15-25% of paddlefish encountering Intake pass upstream of the dam when mainstem river flows are high (>40,000 cubic feet/second) and the natural side channel is flowing. Movements of many telemetered Paddlefish persist upstream to the Powder River confluence area and confirmed angler encounters of Paddlefish were even reported in the Bighorn River during 2017. Similarly, pallid sturgeon have been shown to use the natural side channel to circumvent the dam at high river flows only, and movements have been observed up to and into the Powder River. Nearly all blue sucker, which are incredibly strong swimmers, that encounter the dam pass upstream over the structure regardless of river flow; their movements often extend well upstream of the Tongue River confluence. Shovelnose sturgeon passage rate at the dam has been similar to pallid sturgeon (~13-23% annually); however, most passage occurs over the dam when the spring flow pulse has subsided. Lastly, approximately half of the Sauger moving to the dam pass upstream. Sauger use the natural side channel at times of high river flows and swim over the dam at low river flows.



Tristan Hould at Castle Rock Lake in Colstrip holding a pike.

Southeastern Montana Ponds

Kevin McKoy, Fisheries Technician

Of the 100 plus ponds managed for fish in the regional pond program, most are privately owned and require landowner permission to fish. In exchange for fish stocking and management, landowners allow public access. Ponds are stocked with a variety of fish including

bass, catfish, crappie, perch, and trout. About one third of the ponds are sampled each year and survey results are summarized in the Region 7 Pond Fishing Guide. Surveys in 2018 found 25 of 41 ponds sampled had fishable populations of target species. State hatcheries stocked 62 ponds in Region 7 in 2018 and regional staff conducted wild fish transfers to 1 pond. The Region 7 Pond Fishing Guide is updated annually, free to the public and available at the Miles City office or by calling 406-234-0900. The 2019 guide should be available by mid-March 2019. The guide provides maps of the ponds arranged by county. Ownership and fishery information is also provided in the booklet, including private landowner names and survey results. Use the pond guide or call the Miles City office to get updated information on ponds that have recently experienced fish kills or are reportedly fishing well. As with all private lands, permission is granted through the landowner and must be obtained each and every time before fishing.

It is the responsibility of the fisherman to look up the landowner's phone number and request permission to fish. Anglers may have reduced pond angling opportunity in 2019 based on lower water levels throughout much of Region 7 during 2018.

Fishing Access Sites

Jamie Hould, FAS Program Manager

2018 was another year when we had the privilege of witnessing the awe-inspiring power of the Yellowstone and Tongue Rivers. The spring season consisted of Fishing Access Site (FAS) staff monitoring the ice flows and unpredictable flooding events move in and

FISHING NEWSLETTER 2019

out of the sites along the rivers. The summer season consisted of repairing much of the damage incurred by the spring events. The ice and flood events created a considerable amount of repair and cleanup work for the R7 FAS staff. This also affected visitors as many of the sites were closed to vehicle traffic at one time or another due to flooding and unsafe conditions.

Meyers Bridge, Amelia Island, along with East and West Rosebud fishing access sites had some major flooding events during the months of May and June. Damage to the sites was minimal but the river did deposit a significant amount of silt on the roads and parking areas at Meyers Bridge and Amelia Island. Both sites had silt deposits of up to 3 feet. Vehicle access closures were in place at these sites for the entire month of June. As soon as the flood waters receded FAS crews worked hard to clean the sites of silt and debris so that anglers and other recreationists could access the river. Amelia Island was opened back up to the public on July 6th but due to standing water on the entrance road Meyers Bridge was not open until late July. East and West Rosebud fishing access sites were also flooded and closed to vehicle traffic from May 26th- June 21st. The campground at East Rosebud remained closed until mid-July due to standing water and hazardous trees.

The Miles City area Fishing Access Sites were unaffected by the high water in the spring with the exception of 12 Mile Dam FAS. In late March an ice jam occurred in the Tongue River downstream of the confluence of Pumpkin Creek. This caused water from Pumpkin Creek to jump its banks and flood most of 12 Mile FAS. The flood waters scoured most of the internal roads of



Above: Amelia Island FAS in May 2018. Below: Elk Island FAS in March 2018.

the site washing away the majority of gravel and creating deep washouts throughout the site. It wasn't until mid-July that the site dried out enough for FAS crews to repair the internal roads and open them back up to vehicle traffic.

Fishing Access Sites between Glendive and Sidney were also affected by the 2018 ice out events. Black Bridge and Stipek were covered by ice and debris causing temporary road closures while Elk Island FAS sustained the most damage from the spring ice out. In late March a significant ice jam occurred on the Yellowstone River upstream of the Elk Island FAS/WMA. The flood waters washed around the jam over Elk Island wildlife management area and daylighted back into the main river channel on a path directly through the fishing access site. This caused severe damage to the site washing away most of the road and parking area along with destroying the concrete latrine on the site. A boat ramp at a different location was also destroyed by the ice and flood waters. FWP plans to replace the boat ramp at Elk Island in late summer or early fall of 2019.

Even with the high water, ice events, and temporary closures the region 7 fishing access sites (21) had an estimated 248,766 visitors from November 2017 to November 2018. The region 7 FAS staff hopes you all enjoyed your experiences and hope to see you out on the water next year!





HATCHERIES

Big Springs Trout Hatchery
2051 Fish Hatchery Road
Lewistown, MT 59457
(406) 538-5588

Giant Springs Trout Hatchery
4801 Giant Springs Rd
Great Falls, MT 59405
(406) 452-5734

Sekokini Springs Hatchery
490 North Meridian Road
Kalispell, MT 59901
(406) 857-3744

Bluewater Springs Trout Hatchery
700 Bluewater Road
Bridger, MT 59014
(406) 668-7443

Jocko River Trout Hatchery
206 Hatchery Lane
Arlee, MT 59821
(406) 726-3344

Washoe Park Trout Hatchery
600 W Pennsylvania St
Anaconda, MT 59711
(406) 563-2531

Flathead Lake Salmon & Rose Creek Hatchery
100 Spring Creek Road
Somers, MT 59932
(406) 857-3744

Miles City Fish Hatchery
107 Fish Hatchery Road
Miles City, MT 59301
(406) 234-4753

Yellowstone River Trout Hatchery
17 Fairgrounds
Big Timber, MT 59011
(406) 932-4434

Fort Peck Hatchery
277 Highway 117
Fort Peck, MT 59223
(406) 526-3689

Murray Springs Trout Hatchery
5475 Sophie Lake Road
Eureka, MT 59917
(406) 889-3489



Like us on Facebook and see where we've been and what's new at the hatcheries.

Washoe Park Trout Hatchery

Kerrie Berger, Fish Culture Specialist

The mission of the Washoe Park Trout Hatchery is to maintain Montana's westslope cutthroat trout conservation brood stock, known as the M012. The hatchery maintains the health and genetic integrity of the M012 broodstock and supplies eyed eggs to three other hatcheries in the state. The progeny of the M012 are used for multiple management objectives, including population management, urban fisheries, native species restoration and research. A second facet of the hatchery's mission is to provide public outreach and education. This mission is accomplished by various means including the maintenance of an exceptional interpretive center, classroom education, and hatchery tours.

The hatchery suffered no shortages this year and met all fish stocking and egg requests. 25,000 surplus cutthroats weighing 994 pounds were used to restock a mountain lake in Yellowstone National Park. In fiscal year 2018, 227,044 westslope cutthroat trout were stocked, with a combined weight of 15,400 pounds. The hatchery produced 1.42 million eyed westslope cutthroat trout eggs.

The hatchery staff stocked over 80 water bodies of various types including large and small lakes, alpine lakes, urban fishing ponds and several streams for restoration projects. The hatchery reared 35,000 fingerlings over winter inside the hatchery this year to achieve maximum growth by early spring. Fish reared inside were significantly larger than their outside counterparts and these larger fish were used in water bodies where predation of stocked fish is significant.

Our hooked-on fishing program continued this year



Shawn Smith- stocking fish in rainbow lake.



Fish Culturist Kerrie Berger instructs the Anaconda sportsman's club members on spawning techniques.

and we passed nearly 100 local 4th graders through the eight-part course which includes ice fishing, fly tying, fish dissecting and more. We also gave scheduled tours to over 700 school children. Visitor numbers are estimated to be around 10,000 annually.

Construction of the isolation facility for incubating wild arctic grayling and westslope cutthroat eggs and rearing of fry for conservation

and restoration projects began in November 2017 and continues. Plumbing inside the isolation building will begin this fall, and we hope to have the building in operation Spring 2019. A new roof was put on the shop building as were new gutters. Funding issues postponed the replacement/repair of hatchery siding and updates to the interpretive center again this year.

Flathead Lake Salmon Hatchery and Rose Creek Hatchery

Mark Kornick, Fish Hatchery Manager

The Flathead Lake Salmon Hatchery and nearby Rose Creek Hatchery both located at the northern end of Flathead lake near Kalispell, are just two projects in a diverse, truly collaborative network of the Montana Fish, Wildlife & Parks (FWP) Hatchery Bureau. FWP cold-water and warm-water hatcheries team up with regional fisheries biologists to stock waters using science-driven best management practices placing appropriate species at rates compatible with that lake's productivity and existing biomass. Fish populations are monitored annually in Montana's water bodies by fisheries biologists and technicians and stocking rates may be changed accordingly as population trends require. Our hatcheries are tasked to provide the renowned sporting opportunities funded by both resident and non-resident license dollars and fishing-supporting federal funds. FWP hatcheries also work in crucial native species conservation projects where fisheries biologists partner with governmental, corporate and non-profit organizations.

Fish culture is a highly technical endeavor blending science and art. It is a fascinating and surprisingly complex balance, meeting the needs of an animal encased in human-designed settings built for maximum output. The technologies employed range from crude machines such as siphons, and simple but ingenious high-capacity incubation contraptions, to sensitive, maintenance-demanding electronics. Fish feed supplied by various companies are held to a high standard and are for the most part, a thankfully stable, reliable product. The art side of aquaculture comes in when designing situational "habitats" to meet unique needs of individual fish species; species that evolved worlds away from the featureless rectangular containers, and sterile, unwavering water qualities that hatcheries employ. Fish must be produced in wholly unnatural densities with fish feed, though well-balanced, is nothing like natural foods in texture, consistency, nor flavor.

Through technology, up to the minute innovations, and attention to detail, fish hatchery staff strive to meet or exceed the high standards of rearing fish that are post-stocking. Performance metrics include appearance, complete genetic representation, survival to creel and in some cases spawning fitness.

Flathead Lake Salmon and Rose Creek hatcheries (FLSH) produced over 1.5 million kokanee, over 100,000 westslope cutthroat trout, 100,000 arctic grayling, and 25,000 brook trout. We also stock 30,000 ashley lake "cuttbows". FLSH staff stocked these fish by means of backpack, truck, and helicopter into over one hundred lakes. We work with Washoe Park Hatchery (FWP) receiving eggs and fish for our des-



Brook Trout Spawning Crew Mark Kornick, Tricia Cycz, Amanda Bryson, and Matt Wipf.

ignated waters. We spawn wild kokanee (Lake Mary Ronan) and arctic grayling (Rogers Lake) for our needs and work with Crystal Lakes Hatchery (Private) for our brook trout stocking responsibilities. The rainbow/cutthroat hybrids are in coordination with Ashley Lake Hatchery (private). With a staff of two, FLSH often coordinates with other hatchery staff and fish as needed to most efficiently complete our task. Giant Springs, Arlee, Washoe Park and Big Springs Trout Hatcheries, and Fort Peck Hatchery provided fish, long haul trucks and spawning help. Volunteers are also welcomed seasonally, as workload can accommodate.

Kokanee and More Kokanee

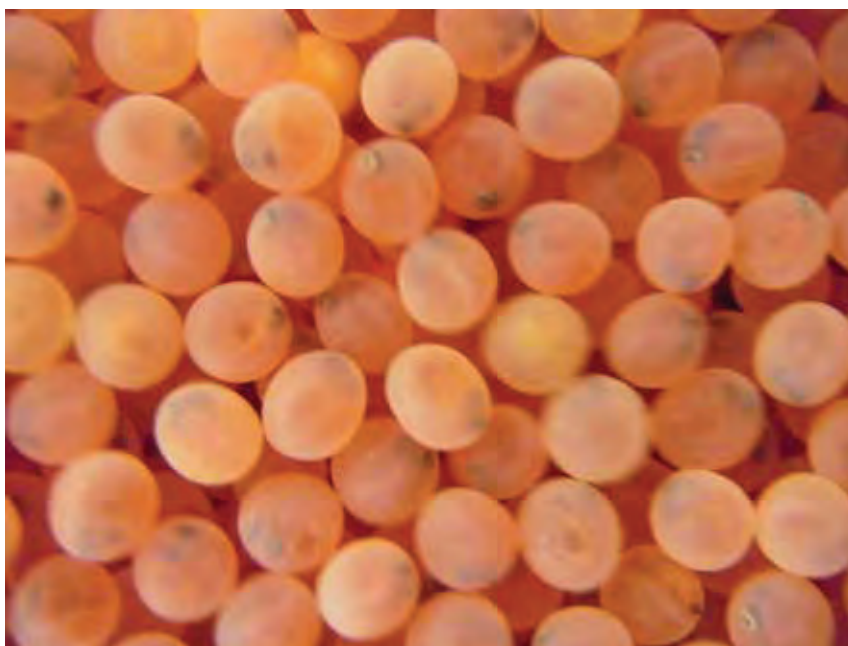
We are a part of the production and ultimate stocking of five species. Of those species, kokanee salmon by far make up most of our production year. They utilize the lion share of our water and raceway space, our fish food budget, and ultimately labor cost. FLSH staff were responsible for every stocked kokanee salmon in the state of Montana in 2018. Many lakes and reservoirs in Montana have naturally reproducing populations that fortunately don't require the attention of hatchery supply. Lakes that don't have population-sustaining spawning habitat, but meet the environmental needs kokanee demand, get our fish.

Kokanee are a non-native fish originally brought here as eggs at the turn of the 20th Century, all fish are hatched from eggs spawned from Montana lakes. Lake Mary Ronan, a nutrient rich natural lake situated west of Flathead Lake, is uniquely managed as both a high-quality fishery and ultimately as an egg source for all of Montana's needs. The stocking rate into Lake Mary Ronan is formulated to assure the purpose of both quality fishing and a reliable egg source.

Kokanee provide a unique niche in the diverse sporting fishing experience of Montana. Strong family and community bonds and traditions have been formed around kokanee fishing. They are highly nutritious, great to eat fresh, canned or smoked as they are essentially a freshwater sockeye salmon. Their relatively short lifespan and diet makes them reliably safe to eat too as larger, longer-living species may concentrate heavy metals and man-made toxins in their flesh. They are a highly sporting fish and on light tackle, kokanee can provide long, spirited, often aerial battles. Kokanee can be predictably easy to catch when abundant once fishermen

better understand their feeding strategies and habits.

Kokanee salmon are stocked between two and four inches in a "put, grow and take" hatchery fish-stocking scheme. This method is a highly efficient means of managing hatchery space where fish are fed to a size large enough to effectively occupy the relative safety of deeper pelagic or limnetic waters. Beyond the shallow littoral zone where most predators dwell, this schooling salmon finds food and safety out of reach of Montana's common predatory fish species. Most kokanee-stocked lakes in Montana harbor fish-eating or piscivorous species like large and smallmouth basses, northern pike and yellow perch. These guys are generally found in shallower waters and are ambush sight feeders. Perch may also occur in deeper waters but mostly exist near the structure the bottom provides.



Above: Kokanee eyed eggs. Right: Male kokanee.

Kokanee Biology **101**

Kokanee thrive in water bodies where the depth provides cool water refuge from summer temperatures. In short, relatively shallow lakes at Montana's latitude won't meet their needs. Kokanee are primarily planktivorous throughout their 3 to 4-year lifespan, mostly feeding upon zooplankton, the tiny critters that most species of fish rely on as essential early in life. And although they will take larger prey like insects and small fish, kokanee utilize a mechanism adapted to filtering the tiny plankton called gill rakers. This organ is present in many fishes, but with kokanee in particular, gill rakers are more densely spaced and numerous. Swimming through waters where plankton are abundant, kokanee "rake" food from the water, then gulping the filtered-out morsels. Kokanee will often be found where the largest concentration of plankton happens to be. This feeding zone changes throughout a 24-hour period. Plankton are generally higher in the water column during daylight hours and deeper in low light and nighttime.

Kokanee evolved in waters where they are preyed upon by larger predatory fish and birds. Their coloration and tendency to school lend credence to this. They are white bellied, and difficult to make out as viewed from below against the daytime sky above. They are darkest on the back, camouflaged against the blue of water. This limits detection from overhead hunters such as osprey. A kokanee's silvery sides and schooling tendency surely confuses predators when attacked, as scores of flashing fleeing salmon makes grabbing an individual a challenge.

This is not to say that kokanee are immune to predation once over deeper waters though. Many kokanee lakes also provide homes to lake dwelling rainbow and

levels and proportional enzymatic reactions is most obvious in the males. The chemical and physical ramp up begins as daylight hours decline in the later summer months of their adult life. Male fish make a more obvious change than the females. During the transition, the jaw and teeth of the male dramatically increase in size. This impressive growth in bone mass actually requires the calcium available in their scales. The scales are resorbed into the bloodstream and then utilized laying down material for teeth and jaws. Along with a fearsome head full of teeth in hooked jaws (referred to as a kype), the male also takes on a deep muscular "hump" behind the head. Both sexes change from a silvery appearance to reddish color during breeding. Once again, the males outdo the females in this arena and exhibit a deeper, more striking color. Female kokanee expend their energy and stored resources in a no less

incredible transition during the breeding season. In their sexual maturing phase, rapidly growing eggs in their ovaries depletes stored fats, proteins and nutrients giving eggs the nutrition to sustain and supply future embryonic fish development. It is no wonder kokanee die soon after spawning with this kind of dedication to the species. Feeding is very limited in spawning age fish during this time, and instead compete for attention and spawning habitat.



brown trout, and/or lake and bull trout which rely on a diet largely of fish. Even cutthroat trout will become piscivorous if given the opportunity. Once these species attain the size and speed to take advantage of fish as a food supply, they may adopt that as their primary feeding strategy. In fact, most if not all Northwest Montana's renowned trophy trout destination lakes are aided by the presence of wild or hatchery-sourced kokanee.

Kokanee exhibit a fascinating transition as adults come into spawning condition. They morph over a relatively short period from a generally non-descript silver color with no obvious male or female characteristics to a well-defined sexual dimorphism that serves them during mating season. These changes will display their dominance to rivals and to fitness to spawn to the opposite sex. This transition involving elevated hormonal

Although fishing from shore can be effective where a lake drops off precipitously, most successful kokanee fishing is from a boat. Outfitted with a sonar fish-finder, kokanee can be easily located because of their schooling behavior. Oftentimes they will show up as a "layer" of suspended fish 15 to 20 feet below the surface. Kokanee schools are rarely stationary, and their feeding habits keep them on the move nearly constantly. They can be caught trolling using flashy spinning or wobbling lures ahead of a small terminal baited hook or fly. Jigging is productive too while slowly drifting or anchored over a school. Fly casting can be successful when conditions allow as kokanee will home in on periodic hatches of insects. In winter, kokanee are targeted by jigging and still fishing. Snagging is legal in some kokanee inhabited waters. Snagging season is limited to the harvest of spawning adult fish in the fall. Snagging season and rules can be found in the annual fishing regulations.

Kokanee Fishing Techniques

Yellowstone River Trout Hatchery

Josh Culver, Fish Culture Specialist

2018 was another productive and eventful year here at Yellowstone River Trout Hatchery. The Yellowstone cutthroat (YCT) brood began spawning in February. The spawning season went very smoothly this year. We had 7 separate egg takes for the year and we finished on April 5. The YCT broodstock produced just over 260,000 green eggs resulting in an average eye-up of over 80%.

In early May grayling were spawned at Green Hollow #2. A successful spawn of 301 females produced a total of 345,730 eggs. All eggs were incubated at the hatchery before being transferred to the biologist for dispersal into remote site incubators in SW Montana.

We also did our annual grayling spawn at Axolotl Lake in mid-May. We had good success with over 482,000 eggs collected from 200 females. The Axolotl eggs were incubated here at the hatchery before being transferred to the biologist. Most of these will be used for remote site incubators in SW Montana.

Late May hatchery crew returned to assist Biologist Jim Olsen with spawning arctic grayling at Mussigbrod lake. A total of 97 pairs were collected and produced 101,000 eggs.

In June, plans were made to return to Pebble creek inside Yellowstone National Park to collect more Yellowstone cutthroat trout, 23 fish were collected to produce 6000 eggs. Eggs were returned to the hatchery for hatching and rearing. Plans are being discussed for using these fish to be infused in the current broodstock being raised at the hatchery.

Late June hatchery crew and fish health crew, loaded with gear, hiked the scenic 5 miles into Sylvan lake to spawn Golden trout. A total of 72 pairs were spawned to produce over 35,960 eggs. Eggs were hatched and reared at the hatchery until September when they were

flown to their new homes in the mountains.

In July we did our high mountain lake plants with FWP pilot Neil Caldwell, 20 lakes were stocked with 63,790 Yellowstone cutthroat trout. 18 lakes were stocked with



Above: Yellowstone - Helicopter plant. Below: Yellowstone - Sylvan Lake.

25,820 golden trout. These fish were stocked by helicopter. Other low elevation lakes stocked by truck were: Hyalite reservoir, Dailey lake, Laurel pond, Sacajewea pond, Broadview pond, Lake Elmo, Ross reservoir, Trout lake, Fairy lake, Lulu creek, Soda Butte creek and



N Fork Sage creek. South Picket Pin and Chrome lakes were stocked using a 4-wheeler. Foolhen was stocked using a backpack. Livingston school system requested fish for use in their farm to school aquaponics program, we supplied them with 50 fish. Fish waste makes good fertilizer and was beneficial to their already successful program.

Giant Springs State Fish Hatchery

Matt Wipf, Fish Culture Specialist

In 2018, Giant Springs State Fish Hatchery (SFH) staff (Ryan Derr, Jerick Graves, and Matt Wipf) drove more than 10,000 miles of Montana's highways and gravel roads to stock over 520,000 fish (rainbow trout and brook trout), which weighed over 33,000 pounds. During a typical year of production GSFH raises over 750,000 fish however, due to budget cuts our catchable rainbow trout lake stockings were cut in half and some were cut completely. Since production is down, we have had time to do some much-needed maintenance. For example, wires that have been buried for 30 years are causing havoc with the alarm system, so we dug those up and replaced them and some of the conduit. We have also done some much needed gutter repair and fish rearing tank repairs.

Currently Giant Springs SFH staff have been putting together a package for upgrading the existing alarm and pumping system.

Updating the alarm system will allow us to monitor our equipment and water quality with a lot more accuracy. New pumps will increase accuracy for water flows to the fish and decrease electrical costs.

Giant Springs SFH uses two feral broodstock sources

(Crystal Lake Brook Trout and Holter Lake Rainbow Trout) and three domestic broodstock sources (Ennis National Fish Hatchery, Murray Springs SFH and Arlee SFH) for our production eggs. One of the feral sources of eggs is Crystal Lake Hatchery, Fortyne, MT which has two lakes Crystal Lake and Black Lake that provide our brook trout brood for Georgetown Reservoir and a handful of prairie ponds. At our last brook trout spawning event we were able to do a little research evaluating the effect of water-hardening eggs in iodine had on bone structure anomalies. We then further investigated the effect of incubating those eggs in chilled water or ambient hatchery water. The results (like usual) were conflicting and this project deserves a further look to better understand the effects of iodine and chilling water during incubation on bone deformity rates.



Giant Springs - Ryan Derr spawning Northern Pike at Ft Peck.

Staff at Giant Springs SFH also helped other Montana hatchery's this year: Ryan Derr got to handle some trophy fish while helping Ft. Peck SFH crew spawn walleye and northern pike. Jerick Graves enjoyed viewing more of Montana's highways through the windshield of Big Springs SFH semis while helping them with their fish stocking season. Matt Wipf bolstered anacondas stocking port-

folio by helping them plant west slope cutthroat trout on the east side of the divide into Tunnel Lake. The Giant Springs SFH staff wishes you a happy fishing season and as always: look for us coming to a lake near you.

Miles City State Fish Hatchery

John Kuntz, Fish Culture Specialist

The Miles City Fish Hatchery was built in the 1950's and is one of the state's two warm water hatcheries. The hatchery pumps its water 2 ½ miles from the Yellowstone River to feed to not only the hatchery building but 49 production ponds as well, amounting to 54 ½ surface acres of aquatic rearing space. The hatchery primarily raises walleye, largemouth and smallmouth bass, though occasionally rears pallid and shovelnose sturgeon, channel catfish, sauger and tiger muskie.

The beginning of 2018 started with the usual maintenance and upkeep of hatchery water lines and equipment, with an extra dose of snow removal included. The unseasonable cold and wet winter pushed our helicopter plants for rainbow trout further back in the year than normal. We received rainbow trout fingerlings from Bluewater Hatchery and were able to fly by early May. We planted 59 ponds with 68,280 fish. It was reported by the region 7 fisheries biologists that the fish we planted grew quickly, likely due to lack of competition and the cool spring eastern Montana experienced.

Setting up production ponds for the summer was a challenge in its own. Right off the bat, a 40+ year old main underground valve rusted and broke. After some quick thinking and on the fly engineering, we made the valve usable, so we could fill our ponds. We then turned our attention to walleye production. Again, the weather did not bode well for our cause, as

the ice didn't break from Ft. Peck until later than normal, leading to poor egg take conditions in mid-May. Once hatched, we received the fry from the Ft. Peck hatchery and stocked our rearing ponds. When all was said and done, we stocked 397,650 walleye to Ft. Peck Lake and a handful of other ponds in eastern Montana. Our bass season passed less desirably as we would have hoped. Our 2015 largemouth bass brood class

wasn't quite to spawning size, and thus, simply didn't produce. The older brood classes were, as with years passed, systematically picked off by roving birds of prey. In the end, we lost nearly 500 breeding adult bass. In previous years, we have had to retire older brood classes due to low numbers for this very reason. Our smallmouth bass did produce, and we stocked 15,870 fish to 10 ponds. Our largemouth bass production amounted to 51,300 fish distributed to 30 ponds across the state of Montana.

Some noteworthy staff news:

Cory Hagemeister was hired as the Miles City Fish Hatchery manager officially on July 1st. Cory was the acting manager the year prior and a fish culturist at Miles City Hatchery since 2011.

In August of 2017, John Kuntz joined the hatchery staff as a one-year temporary hire after 7 years as a seasonal. He is now a full-time fish culture specialist.

After some years, we are finally back to a full staff. The staff is now diving in to winter maintenance and looking forward to a better production year in 2019.



Above: Miles City airplant. Below: Miles City cleaning intake settling pond.



Murray Springs Trout Hatchery

Jason Nachtmann, Fish Hatchery Manager

The Murray Springs Trout Hatchery (Eureka, MT) was constructed in 1978 to mitigate for fishery losses in the Kootenai River that were caused by the construction of Libby Dam and the subsequent creation of Lake Koocanusa. The operation and maintenance of the hatchery is conducted by Montana Fish, Wildlife & Parks and the Army Corps of Engineers. The hatchery maintains the gerrard rainbow trout broodstock.

Gerrard rainbow trout are known to be evolutionarily specialized resulting in older age at maturity, a long-life span, a large mouth, and the capacity for rapid and sustained growth.

Gerrard rainbow trout fisheries management objectives for Lake Koocanusa include: (1) Create a successful large rainbow trout fishery ($\geq$ 22 inches in length, with the potential to exceed 10 pounds). (2) Provide catch rates of approximately 20-30 angler-hours/fish. (3) Introduce a piscivorous trout species that can forage on kokanee salmon to decrease densities and increase maximum size. (4) Introduce a trout species that is reproductively sterile (3N triploid) to prevent hybridization with native westslope cutthroat trout. (5) Stock a trout species that can be visually differentiated from native species upon capture.



Above: John Lord with a 19 pound gerrard broodfish. Below: Murray - Region One fisheries and hatchery staff removing the adipose fins from gerrard production fish prior to stocking the fish into Lake Koocanusa.



Historically (2009-2012), to meet management objectives we purchased triploid (sterile) gerrard fish eggs from the Freshwater Fisheries Society of British Columbia. The eggs were incubated and raised at the hatchery, and the resulting fish were stocked into Lake Koocanusa the following year as catchable size trout. The average number of annually stocked fish into Lake Koocanusa from 2010-2013 was 24,200 fish (average of 3,100 pounds fish per year).

In 2013, the gerrard rainbow trout broodstock, consisting of four age-classes of broodfish, was transferred from the Kootenay Trout Hatchery (Wardner, BC) to Murray Springs. Murray Springs now maintains the broodstock, which now consists of seven age-classes (0+ to 6+ years of age).

The broodstock has allowed us to double the amount of fish being stocked into Lake Koocanusa, and to provide gerrard eggs to other FWP hatcheries for stocking into additional waters in Montana. The average number of annually stocked fish into Lake Koocanusa 2014-2018 was 64,200 fish

(average of 7,100 pounds of fish per year).

We hope that you get outside, take a kid fishing, and visit Lake Koocanusa for a chance to catch the "Giants of Gerrard". Also, visit the hatchery and check out the gerrard broodstock and pro-

duction fish.

(This article is dedicated to John Lord who retired in 2018 after 27 years of service to FWP and the people of Montana.)

Big Springs Trout Hatchery

Sam Stafslie, Fish Culture Specialist

Big Springs Trout Hatchery had lower fish numbers, but still had a successful year raising fish from eggs all the way up to 15 inches. The hatchery ended up raising around 50% of its 7 inch and larger fish compared to other years due to budget cut backs but stayed busy throughout the year stocking fish and keeping up on maintenance. Big Springs Trout Hatchery raised five different strains of rainbow trout such as Arlee, Arlee-Erwin, Eagle Lake, Gerrard, and the McConaughy strain. We also raised brown trout, chinook salmon, and helped stock out kokanee salmon as well. We stocked a total of 808,171 fish into 7 urban ponds and 48 reservoirs and ponds throughout the state which totaled 74,875 pounds.

The hatchery stocked 485,102 rainbows from 2-7 inches and 286,964 rainbows from 7-15 inches, along with 36,651 brown trout. We assisted the Flathead Lake Salmon hatchery in stocking 81,664 kokanee salmon, and the hatchery raised and transferred 61,206 chinook salmon to the Fort Peck Hatchery. These fish were transferred because our previous plants haven't been showing up from anglers catching them or returning to spawn, and we know this because the chinook from our hatchery have had their adipose removed. One reason may be that they are imprinting to the water supply at our hatchery, so transferring them to Fort Peck Hatchery may allow them to imprint to that water source and hopefully start showing up in catches or during the spawning season. These fish had their adipose fin clipped, so if you happen to catch a chinook on Fort Peck without an adipose fin, contact Heath Headley at 406-526-3471 and let him know you caught one!

A question we commonly get at the hatchery is how we

transfer our fish to various publicly accessible lakes in the state. We have three different sized trucks we use to stock these fish into the different water bodies. One truck is a three-quarter ton pickup that can hold up to 200 pounds of fish, another truck we have is a one-ton pickup that can hold 500 pounds of fish, and the third size are class B commercial tanker trucks that can haul anywhere from 1,800 pounds to 2,400 pounds. Before the fish are loaded, we may add ice to help lower the water temperature and add salt as well to help reduce the amount of stress since the fish are very crowded.

Because the fish are so crowded in the tanks and consume large amounts of oxygen, we have oxygen diffusing into the water from air stones at the bottom of the tank, and aerators running to help circulate the water within the tank to help them breathe. Without the air stones and aerators, the fish would die very quickly. While we are driving, we will stop every two hours to check on the fish to make sure they are fine, along with checking to make sure the oxygen is still coming out of the air stones and check the aerators to make sure they are still circulating water. Once we reach the location, we take special care not to let our equipment touch the water, so we do not bring back harmful pathogens to our hatchery. We will also make sure that the water at the location is ok by checking for potential prob-

lems such as very low water levels, high water temps, or excessive amounts of vegetation along the shoreline. Once it is established that the waterbody is ok, we then put a tube on the back of the truck and open the gates to the tanks and release the fish to their new home.

While visiting Big Springs, if you see a worker and would like a tour or to look around inside, please feel free to ask and they will be glad to show you around if possible and explain the different functions of the hatchery.



Big Springs - Jerick Graves helping haul fish for Big Springs SFH.

Bluewater Springs Trout Hatchery

Dave Ellis, Fish Culture Specialist

In 2018, Bluewater continued to provide fish for approximately 35 waters scattered throughout the southern portions of the state. The hatchery raises four different strains of rainbow trout including arlee, arlee/erwin crosses, eagle lake, some California eagle lake, and gerrard rainbows. These fish are stocked into reservoirs, lakes, and ponds to maintain sport and urban fisheries. The hatchery also over-winters the large and smallmouth bass broodstocks which arrive from the Miles City Fish Hatchery in September. Bass are maintained with rainbow trout forage throughout the winter until they are returned to Miles City Hatchery for spawning in April. This year, some of Bluewater Hatchery catchable production was reduced in response to budget reductions.

We raise a variety of strains of rainbow trout depending on what characteristics biologists are looking for. Each strain is a little different from the others. Some are longer lived than others but may be not as aggressive. Others may grow faster, but don't live as long. Some biologists mix a variety of strains to meet a variety of management goals. In addition, we also raise a few triploid rainbows which are sterile, so they cannot mix with wild populations. In the past, Bluewater Hatchery has also

raised grayling, Yellowstone cutthroat, kokanee salmon, golden trout, and pallid sturgeon (experimentally).

In 2018, Bluewater hatchery stocked 652,518 fish weighing 28,477 pounds and drove a total of 14,191 miles to deliver these fish to waters located in regions 2,3,4,5 and 7. Some of the major waters include: Georgetown Lake, Clark Canyon, Canyon Ferry and Cooney Reservoirs. Approximately 240,000 fish weighing 857 pounds were produced to supply fish for bass forage.



Above: Bluewater staff molding young minds. Left: Bluewater - Planting Cooney Reservoir.



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Sekokini Springs Experimental Hatchery

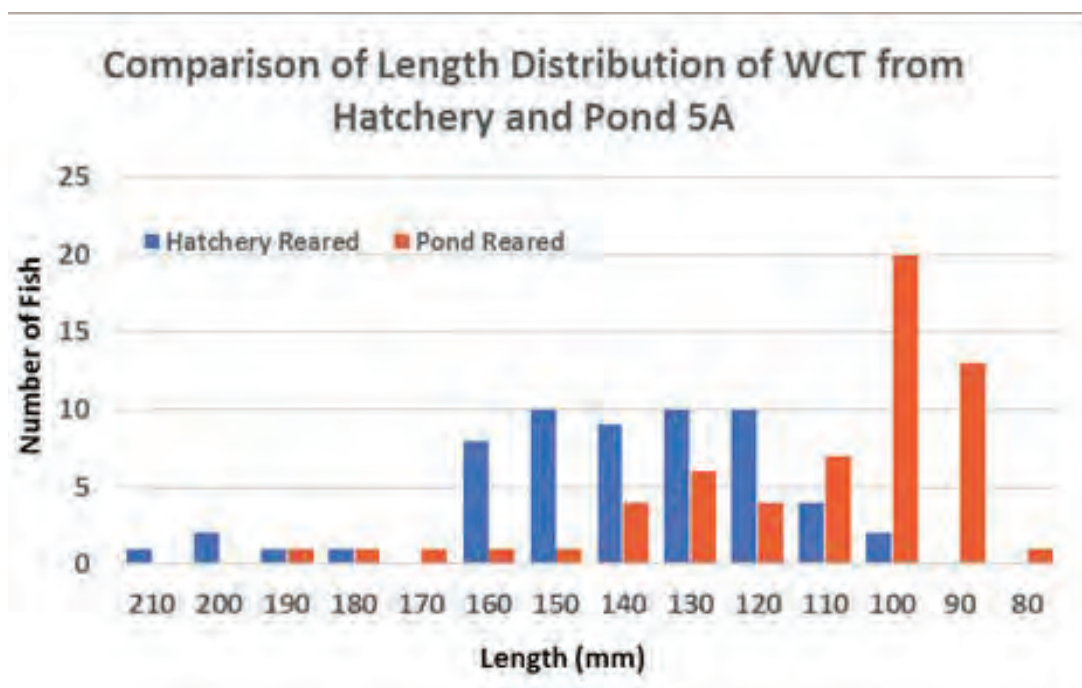
Scott Relyea, Fish Hatchery Manager

Naturalized Rearing

Construction on the four outdoor rearing ponds and wetland was completed in the fall of 2015. One pond (5A) was slated to rear one-year old westslope cutthroat trout for planting Sunburst Lake in August 2018. Submerged brush and floating islands were added to the pond for structure during the summer of 2016. The pond was fertilized with alfalfa pellets from May through July of 2017 to increase productivity. In early August, 1,000 fry were released into the pond with an additional 1,700 fry from the same lot kept in the hatchery for comparison. The pond was fertilized as needed through September to maintain phytoplankton/zooplankton populations, but no trout feed was used. The fry in the hatchery were fed daily at a rate of 2-3% body weight through the same period. This rate was reduced to 1% as water temperatures dropped over the winter. Fertilization of the pond was halted until water temperatures warmed in late April of 2018 at which time expired trout feed was added every 7-10 days to develop and maintain

a phytoplankton/zooplankton bloom. The feed rate for the hatchery fry was reduced to 0.8 % body weight during the same period. Fry from both sources were inventoried on August 20th and included length and weight data from a random sample of 60 trout. Only 248 of the original 1,000 pond fry were found. Since escapement is nearly impossible, predation is believed to be the primary cause of the loss of trout. Western garter snakes, kingfishers, and a great blue heron were all observed in the rearing pond area during this time. Predacious diving bugs (Belostomatidae) aka “toe biters”, large water beetles (Dytiscidae), and dragonfly

larvae (Gomphidae & Aeshnidae) were abundant in the pond and likely preyed on the fry during the first summer. There were 1,432 fry remaining in the hatchery. A sample of 60 trout were removed in June for an annual disease test. The remaining loss of roughly 200 trout was attributed to a short bout with cold water disease in May (122 trout) and sampling error. The pond trout were smaller with 80% 3.5-5 inches in total length, while 80% of the hatchery trout were between 5 to 6.5 inches long. Both groups had a few larger fish over 8 inches in length. Figure 1 compares the range of sizes for the two groups. The mean condition of the pond-reared trout was slightly lower (0.92 vs 0.94) but wasn't



Length frequency histogram comparing 1-year old westslope cutthroat trout from the same lot raised in a hatchery and an outdoor pond.

significant. There was some mild to moderate fin erosion of the dorsal and caudal fins of the hatchery trout, but none on those from the pond.

Overall, the results were promising. Mortality rate and growth were comparable to wild populations. In the future, predation can be reduced by stocking the fry later in the summer, enclosing the pond with bird netting, and adding more structure in the pond. Growth rate can be increased by establishing bank vegetation, increasing fertilization, and adding some supplemental feed when water temperatures are above 55 degrees F.

Jocko River Trout Hatchery

Stephanie Espinoza, Fish Culture Specialist

Greetings from the Jocko River Trout Hatchery crew! The three full time employees have been very busy this year producing and raising beautiful Arlee rainbow trout to stock into the many gorgeous lakes, ponds and reservoirs all over the great state of Montana. The “Arlee” strain of rainbow trout is an aggressively feeding, fast growing and easily catchable cold-water fish species. The creation of the parental stock of the Arlee rainbow trout began in 1953 when the then current strain of Donaldson trout was crossed with the Missouri strain from the University of Missouri, which originated from the McLeod strain native to California.

The Jocko River Trout Hatchery was purchased by the State of Montana in the early 1950’s and has been ran and managed by Montana Fish Wildlife and Parks since then. This hatchery is both a brood facility and a production hatchery. We manage and maintain the captive, domesticated Arlee broodstock that spawns annually from which we collect over 5.5 million eggs. Most of these eggs are shipped to other state and private hatcheries where they are raised to stocking lengths. We keep around 300,000 eggs for our own production needs. Most of the fish we stock leave the hatchery at fingerling size, about 5 to 6 inches, but we also have a substantial catchable size (7-12 inches) program of about 30,000 fish annually and we also stock our very large retired brood fish after spawning season. The biggest one we weighed this year was 20.38 pounds!

The goals of our stocking program within fisheries management are to supplement sport fishing in popular lakes and reservoirs that receive a lot of angling pressure, stock fish in bodies of waters where fishing would otherwise not exist, provide accessible fishing for the

public, to deflect fishing pressure from native and/or wild fish populations that can be adversely affected by overfishing and to stock urban ponds and designated kid’s fishing ponds. We feel it is very important to provide accessible and successful fishing for kids, hopefully inspiring the next generation of future anglers and conservationists.

A primary function here at the Jocko River Trout Hatchery is to spawn the Arlee Rainbows and create the next year’s production fish and future broodstock. Spawning season is our busiest and most exciting time of the year and begins the first week in October and ends the last

week in December.

Spawning season is the time period during which the males and females are “ripe”, and the eggs can be collected and fertilized. Timing is dependent on water temperature regimen, photoperiod and genetics. Our water temperature at the Jocko River trout Hatchery ranges from 42 to 52 degrees Fahrenheit. Females are sorted and spawned every two weeks and there

are a total of 7 egg takes per season. To preserve

the genetic integrity of the broodstock over time, age classes of fish are crossed. For example, 2yr old males are crossed with 3yr old females and 3yr old males are crossed with 4yr old females. The average 3yr old female produces about 4,000 eggs while the average 4yr old produces about 6,000 eggs. On average, 400 4-year old and 800 3-year old females are spawned per year, producing approximately 5.5 million newly fertilized eggs. These eggs are incubated until they reach the “eyed” stage of development (approx. 20 days with our water temperature), at which time they are either shipped to other hatcheries for hatching and rearing or retained to be hatched and reared at Jocko River Trout Hatchery.

We also have a very well established triploid program here at the JRTH. Most living things and our normal



Fish Culture Specialists with four year old female Arlee rainbow trout.

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fish have chromosome pairs, they are diploid. When a fish has a triple set of chromosomes it is a triploid. To create triploidy in our fish we take the eggs, post fertilization, and put them into a commercial hydrostatic pressure chamber. As the eggs are going through a certain stage of development, meiosis, we put about 9,500 pounds of pressure on them which interrupts the cell division process and creates fish with triploid chromosomes. This process renders the fish sterile and therefore they cannot reproduce. This allows fisheries managers to be able to put these rainbows in more sensitive water bodies to prevent them from hybridizing with our native fish populations. We have consistently received 100% on our triploidy verification tests every year.

We begin our planting/stocking season in January. We do a few plants through the ice in popular ice fishing ponds and really get moving in the spring when we complete most of our plants. This is when we will probably meet you out there getting your fishing on. In the spring and fall of 2017 we planted over 248,400 fish into 48 bodies of water, mostly here in the Northwestern part of the state. The plant we are most proud of is Brown's lake located near Ovando, MT. With the help of local biologists, we boat planted 21,000 6.76-inch fish into the lake. Normally we hope to stock at least a five-inch fish, but we far exceeded that. We loaded up and transported over 2,300 pounds of fish that day, it was awesome!

We finished a large construction project this fall. Last year we began by demolishing two sets of older, deteriorating raceways and replaced them with four brand new raceways of similar design with some additional upgrades. It was an involved project and we are happy with the new improvements.

The hatchery is open to the public every day of the year from 8 am to 5 pm. We have many visitors throughout



Jocko River Trout Hatchery manager with four year old female Arlee rainbow trout.

the year but in the spring and during spawning season is when we see the most people. We have many school groups come to visit; from preschoolers to college age students. We really enjoy showing people firsthand what we do here and love the interest and curiosity it generates. Hatcheries are an incredibly important facet in fisheries management and we truly appreciate your support, thank you.

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Fort Peck Fish Hatchery

Ryan Lott, Fish Culture Specialist

The Fort Peck Multi-Species Fish Hatchery (FPFH) was built by the Army Corp of Engineers, and is operated by Montana Fish, Wildlife and Parks (FWP). The hatchery went into production in January 2006. Encompassing nearly 100 acres of land, the hatchery is comprised of a 35,000 sq. ft. rearing/office building, 40 walleye/northern pike rearing ponds totaling 45 surface acres, and eight 80ft raceways. The primary function of the FPFH is to provide fish for sport fishing and recreational opportunities to anglers in Northeastern Montana. Species raised at the FPFH include: walleye, northern pike, Chinook salmon and rainbow trout.

The 2017/2018 spawning/stocking season at FPFH kicked off last fall with the annual Chinook salmon spawn and finished up with the walleye/northern pike spawn/stocking in early spring through July. Here is a brief overview of our efforts throughout the season.

We had a very successful Chinook salmon spawning season last fall. The fish that were brought in were of better quality and appearance than in years past, which resulted in better egg quality and better hatching success. We spawned 198 female salmon in 2017 which gave us 791,000 green eggs. The eggs incubated and hatched through the winter months and by the first week of June they were big enough to be stocked back into Fort Peck Reservoir. We ended up stocking 374,000 fingerling (4"-5") Chinook salmon into Fort Peck Reservoir. Our normal stocking locations are the Spillway area, Fort Peck Marina and Duck Creek, but with the spillway running



Ft Peck - Collecting eggs from a ripe female Chinook salmon. Below: Ft Peck - Fisheries Technician Josh Janecek with a nice ripe female Chinook salmon.



due to the high reservoir elevations and wet spring, we had to come up with alternate locations to and keep fish from going down the spillway. Ultimately, we ended up stocking salmon at Rock Creek, Duck Creek and the Pines.

Mother Nature wouldn't let go of winter in 2018 which resulted in a late start for our annual walleye/northern pike spawn. Due to the long winter and ice coming off late on Fort Peck the first traps weren't set until April 22. Our first spawn was on April 23rd and we finished up on May 6th. Due to the late start many of the fish that were collected had already released their eggs. We collected a little over 24 million walleye eggs and 2.2 million northern pike eggs. FPFH stocked 3.1 million walleye fry (4-5 days old) and 112 thousand northern pike fry into 36 of our rearing ponds. Luckily North Dakota had a surplus of 5 million walleye fry to help FPFH and Miles City Fish Hatchery finish stocking the rest of the rearing ponds. Roughly

481 thousand walleye fingerlings (1"-2") were stocked at various locations on Fort Peck Reservoir. An additional 204 thousand walleye fingerlings were stocked in various lakes and reservoirs throughout FWP's regions 4,5 & 6. Additionally, FPFH stocked 518 thousand

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northern pike fry and 19 thousand fingerlings in FWP's regions 6 & 7. Even with the low number of walleye eggs taken this last spring not all is lost. Similar events took place back in 2011 with a long winter and ice not coming off till the middle of April which resulted in a low egg take. Through sampling efforts from 2011 to the present, data shows that one of the strongest/biggest year classes that we are seeing is from that 2011-year class. This means that even though we had a poor egg collection, a good number of fish traveled up the Big Dry Creek and successfully spawned on their own with their offspring recruiting to the system. We are hoping to see similar results from the 2018-year class.

FPFH also raises and stocks two different strains of rainbow trout for various ponds and reservoirs throughout FWP's region 6. We receive our first batch of trout eggs in September from Ennis National Fish Hatchery which are an Arlee x Erwin strain of rainbow trout. These trout are raised to catchable size (7"-9") and are stocked mainly in urban and kid's ponds at several location in region 6. In 2018 we stocked a total of 12,786 catchable trout in region 6. The other strain of trout that we raise and stock is the Arlee rainbow trout. We receive these eggs in December from the Jocko River Trout Hatchery which is state owned. This strain of trout is raised to fingerling size (2"-4") and stocked by helicopter and truck in early spring. Last spring, we stocked 36 different ponds totaling 66,500 fingerlings throughout FWP's region 6.



Above: Walleye spawn volunteer Sean Lott holding a nice green female walleye. Below: Collecting eggs from a ripe female Chinook salmon.



If you would like to keep track of FPFH and FWP hatcheries stocking numbers and locations, you can go to FWP's website <http://fwp.mt.gov> and click on the FishMT tab, then the fish stocking icon, and that will give you access to the 6-year stocking plan for future plants. There is also information on past stocking records.

Our visitor center is open 7:00am to 4:00pm Mon-

day thru Friday, and 8:00am to 5:00pm Saturday, Sunday and Holidays. Tours are given by appointment only, by calling (406) 526-3689 with usually one to two days advance notice.

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Fish Health Lab

Ken Staigmiller, Fish Health Coordinator

Amanda Bryson, Fish Health Specialist

The Fish Health program is located at the Giant Springs State Fish Hatchery in Great Falls. This statewide program consists of two employees and is responsible for the health of all wild and hatchery fish in Montana. Preventing the spread of infectious diseases is the primary focus of the program with the majority of time being spent on pathogen surveillance of wild and hatchery populations. Last year over 40

wild populations were tested for regulated pathogens so that fish or eggs could be moved for either recreational or conservation purposes. Annual testing was also conducted at 12 State owned fish hatcheries and 5 private fish hatcheries. In addition to pathogen surveillance, diagnostic services for wild and hatchery fish is provided by the program as well.

In the summer of 2016 a large fish kill occurred on the Yellowstone River, caused by the microscopic parasite *Tetracapsuloides bryosalmonae*. In the time since then, the fish health program has collaborated with biologists from the United States Geological Survey and the United

States Fish and Wildlife Service to learn more about the ecology and distribution of the parasite. Follow-up studies indicate that unusually low flows and high water temperatures, combined with a high abundance of the bryozoan host, created a unique set of circumstances causing high mortality. While it appears that the parasite is widely distributed within the State, the potential for future outbreaks is somewhat unclear due to the complex life cycles of the parasite and hosts, as well as the complex ecological factors involved.

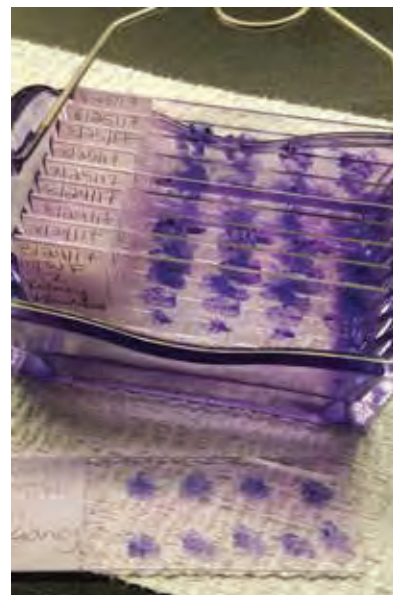
Within the last couple years several private fish hatcheries in Montana have become infected with *M. cerebralis*, the parasite that causes whirling disease. While the parasite is widespread in the State, keeping the State and private hatchery systems free of the parasite to reduce further impacts of the disease remains a top priority for the program.

We have worked with the private hatcheries to find ways to remove the parasite and reduce the risk of infection in the future. Fish for private pond stocking have been in short supply the last couple of years and we have seen an increase in importations of fish from out-of-state. Fish importations bring along additional risks of pathogen introductions as well as increased time spent permitting by fish health program. Reviewing the importation requests and issuing fish import permits is a valuable

management tool to help reduce the likelihood of inadvertently introducing new unwanted diseases.



Above: Amanda Bryson disease sample at Holter Reservoir. Below: Pathogen sampling at Lake Mary Ronan.



Kidney imprints for *T. Bryo*.

AQUATIC INVASIVE SPECIES

Liz Lodman, AIS Education & Outreach Coordinator

In the fall of 2016, mussel veligers, the microscopic larvae of invasive quagga and zebra mussels, were discovered in 3 locations on Tiber Reservoir and a suspect sample was found in Canyon Ferry reservoir. These detections triggered a natural resource emergency and drastically changed the way Montana addresses aquatic invasive species (AIS). FWP has made many improvements to tackle this threat and improve the AIS program including: Creating the AIS Bureau to encompass all aspects of AIS prevention including early detection, rapid response, control, outreach and vector management:

- Increasing the number of watercraft inspection stations state-wide
- Expanding monitoring to additional waterbodies state-wide
- Improving the capacity and efficiency of the AIS lab to analyze water samples
- Expanding the outreach and media campaign to reach residents and visitors coming to Montana
- Building partnerships with organizations and stakeholders to foster a unified effort to stop the movement of AIS in Montana
- Watercraft Inspection Stations Watercraft inspectors prevent the movement of AIS by looking for mud, plants, and invasive animals attached to boats, trailers, and gear; and by removing standing water from bilges and live wells.



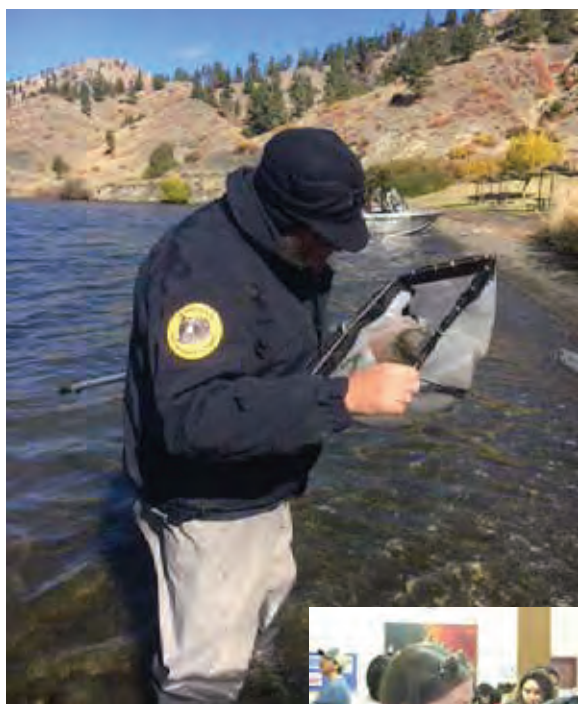
FWP increased the number of watercraft inspection stations state-wide, expanded the hours stations were open each day, and extended the operating season from March to October. FWP created partnerships with these organizations to operate inspections stations: Bighorn Canyon National Recreation Area, Blackfeet Tribe, Confederated Salish & Kootenai Tribes, Garfield Conservation District, Glacier National Park, Missoula County Weed District, and Whitefish Lake Institute.

Above: Aquatic invasive mussels on boat at the Anaconda watercraft inspection station. Below: Boat inspections at Canyon Ferry.



In 2018 inspectors discovered 16 boats with invasive mussels and over 200 boats and trailers with aquatic plants.

Early Detection & Monitoring FWP monitors for all aquatic invasive species, including zebra/quagga mussels, Asian clams, New Zealand mudsnails, Eurasian watermilfoil, flowering rush, curly-leaf pondweed, and other species not known to occur in Montana. In 2018 monitoring crews surveyed 1,450 sites on 250 unique waterbodies. No invasive mussels were detected! FWP used multiple methods to search for invasive mussel adults and larvae on Tiber and Canyon Ferry, but no mussels were detected this year. A new population of Faucet snails was discovered on Lake Frances. Fragrant waterlily has expanded to additional lakes in western Montana.



Above: AIS monitoring.
Below: AIS education event at Browning.



Response Guidelines identifies the roles and procedures to implement a well-coordinated response. In order to prepare for a possible mussel detection, FWP and our partners conducted a rapid response exercise on Flathead Lake.

AIS Outreach

FWP expanded AIS education and outreach to better inform boaters, anglers, and out-of-state visitors about Montana's AIS laws and how to prevent transporting AIS. In 2018 FWP partnered with DNRC and the Invasive Species Action Network to provide AIS training workshops to 75 natural resource professionals. Over 2,500 school students attended AIS presentations. FWP is reaching out to nontraditional audiences, like irrigators, agriculture producers, construction contractors, and float plane pilots to prevent the transport

Rapid Response Plan

If invasive mussels were detected in Montana waters, the State of Montana's Dreissenid Mussel Rapid

of AIS.

To learn more about the AIS program go to www.CleanDrainDryMT.com.




Your watercraft must be inspected if:

- You encounter an open inspection station.
- You are coming into Montana from out-of-state.
- You are traveling west over the Continental Divide.
- You are launching anywhere within the Flathead Basin and your watercraft last launched on waters outside of Flathead Basin.

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**MONTANA FISH,
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MONTANA FISH RECORDS

FISH	MONTANA NATIVE	LENGTH (inches)	WEIGHT	GIRTH (inches)	SITE	ANGLER	BAIT TACKLE	DATE
Arctic Grayling	■	20	3.63 lbs.	11.7	Washtub Lake	Glenn Owens	Wet Fly	6/28/03
Bigmouth Buffalo	■	40.7	57.75 lbs.	32.5	Nelson Reservoir	Craig D. Grassel	Bow & Arrow	6/4/94
Black Bullhead		14.37	2.60 lbs.	11.5	Smiley Slough	Birrell White	Bait	6/20/09
Black Crappie		16.7	3.13 lbs.		Tongue River Reservoir	Al Elser		1973
Bluegill		11	2.64 lbs.	17	Peterson's Stock Dam	Brent Fladmo	Worm	6/3/83
Blue Sucker	■	32.56	11.56 lbs.	17.09	Milk River	Dean Armbrister	Spinner	5/14/14
Brook Trout			9.06 lbs.		Lower Two Medicine Lake	John R. Cook		1940
Brown Trout			29 lbs.		Wade Lake	E.H. "Peck" Bacon		1966
Bull Trout (Dolly Varden)	■	37	25.63 lbs.	25		James Hyer	Trolling Line	1916
Burbot	■	39	17.08 lbs.	16.25	Missouri River Wolf Point	Jeff Eugene Iwen	Minnow	4/18/89
Channel Catfish	■	41.75	34.8 lbs	25	Fort Peck Reservoir	Dan Davenport	Jig	7/26/13
Chinook Salmon		38	31.13 lbs.	26.5	Fort Peck Reservoir Face of Dam	Carl L. Niles	Diamond King Spoon	10/2/91
Cisco		18.2	2.08 lbs.		Missouri River	Troy Holstein	Jig & Minnow	6/2/14
Creek Chub	■	11.0	.52 lbs		Harbaugh Bass Pond	William Bibeau	Worm	5/12/13
Coho Salmon		25.5	4.88 lbs.		Fort Peck Reservoir Face of Dam	Irven F. Stohl	Daredevil	5/29/73
Common Carp		38	40.2 lbs.	30.5	Nelson Reservoir	Jared S. Albus	Bow & Arrow	5/24/98
Cutthroat Trout	■		16 lbs.		Red Eagle Lake	Wm. D. Sands		1955
Emerald Shiner		3.43	0.01 lbs.		Park Grove Bridge	Ike Braaten	Rapala	6/9/06
Flathead Chub	■	11.2	0.59 lbs.		Thornton Pond	Douglas Jordan	Worm	4/29/01
Freshwater Drum	■	29.5	21.59 lbs.	26.5	Fort Peck – Ghost Coulee	Matt Washut	Smelt	5/3/03
Golden Trout		23.5	5.43 lbs.	13	Cave Lake	Mike Malixi	Lure	7/16/00
Goldeye	■		3.18 lbs.		Nelson Reservoir	Don Nevrvy	Jig/Power Crawler	7/4/00
Green Sunfish		9.0	0.84 lbs.	9.87	Hickson's Pond	Bette Schmieding	Worm	5/25/09
Kokanee Salmon		26.8	7.85 lbs		Hauser Lake	John Bomar	Jig	9/23/03
Lake Chub	■	5.9	.075 lbs.	3.4	Corner Lake	James Cashell	Artificial Fly	7/23/17
Lake Trout		42.5	42.69 lbs.	31.5	Flathead Lake	Ruth Barber	Flatfish	6/23/04
Lake Whitefish		27	10.46 lbs.		Flathead Lake	Swan McDonald V	Jig	8/26/06
Largemouth Bass		22.5	8.80 lbs.		Noxon Rapids Reservoir	Darin Williams	Rubber Tube Bait	5/2/09
Largescale Sucker	■	23.1	6.16 lbs.	14.8	Woodland Pond	Kevin Fraley	Worm	6/27/08
Longnose Sucker	■		3.27 lbs.		Marias River Loma	Ray Quigley	Worm	5/8/88
Mottled Sculpin	■		0.05 lbs.		Belt Creek (North of Neihart MT)	Brad Sullivan	Worm	7/30/01
Mountain Sucker	■	6.2	1.60 oz.		Beaver Creek Reservoir	Robert Garwood	Worm	4/23/01
Mountain Whitefish	■	23	5.11 lbs.	12.5	Hauser Reservoir	Walt Goodman	Rapala	10/10/07

FISHING NEWSLETTER 2019

MONTANA FISH RECORDS

FISH	MONTANA NATIVE	LENGTH (inches)	WEIGHT	GIRTH (inches)	SITE	ANGLER	BAIT TACKLE	DATE
Northern Pikeminnow	■	27.125	7.88 lbs.		Noxon Rapids Reservoir	Darrel Torgimson	Lure	5/28/91
Northern Pike			37.5 lbs.		Tongue River Reservoir	Lance Moyer		1972
Paddlefish	■	77	142.5 lbs.	41.75	Missouri River Near Kipp Park	Larry Branstetter	Snagged	5/20/73
Pallid Sturgeon	■		60 lbs.	27.5	Yellowstone River Near Sidney	Gene Sattler		5/13/79
Peamouth	■	16.125	1.52 lbs		Clark Fork River	Mike Jensen	Artificial Fly	7/29/07
Pumpkinseed		9.5	0.96 lbs.		Upper Thompson Lake	Nathan Bache	Lure	7/30/06
Pygmy Whitefish	■	9.84	0.36 lbs.	6.3	Little Bitterroot Lake	Richard Geldrich	Maggot	2/13/10
Rainbow Trout		38.62	33.1 lbs.	27	Kootenai River David Thompson Brdg	Jack G. Housel, Jr.	Lure	8/11/97
Rainbow-Cutthroat Hybrid Trout		35.75	30.25 lbs.	27.5	Ashley Lake	Pat Kelley	Bait	5/16/82
Redside Shiner	■	6.5	0.10 lbs.	3.75	Lost Lake	Josh Ahles	Worm	8/21/01
River Carpsucker	■	24	6.95 lbs.	16.5	Fort Peck Reservoir	Brady Miller	Bow & Arrow	8/15/08
Rock Bass		10.8	1.31 lbs.		Lower Crazy Head Springs Pond	Karson Campbell	Nightcrawle r	4/26/14
Sauger	■	28.2	8.805 lbs.	15.1	Fort Peck Reservoir	Gene Moore	Whistler/Mi nnow	12/12/94
Saugeye			15.66 lbs.		Fort Peck Reservoir Squaw Creek	Myron Kibler	Minnow	1/11/95
Shorthead Redhorse	■	20.25	4.68 lbs.		Marias River Near Loma	Ray Quigley	Worm	4/14/85
Shortnose Gar	■	35	7.41 lbs.		Fort Peck Dredge Cuts	Brandon Hansard	Bow and Arrow	5/16/13
Shovelnose Sturgeon	■	39.75	14.125 lbs.		Missouri River	Chad Buck	Nightcrawle r	5/21/10
Smallmouth Bass		21.0	7.51 lbs.	19	Fort Peck Reservoir	Mike Dominick	Dropshot Worm	9/23/17
Smallmouth Buffalo	■	38	38 lbs.	29.25	Nelson Reservoir	Brady Miller	Bow & Arrow	4/28/07
Spottail Shiner		3.0	.02 lbs.		Tiber Reservoir	Joe Hagengruber	Worm	8/14/10
Stonecat	■	10	0.54 lbs.		Milk River	Dale Bjerga	Worm	6/16/96
Tiger Muskellunge		50	38.75 lbs.		Deadmans Basin Reservoir	Leo Cantin	Bait	9/2/12
Tiger Trout		20.6	4.04 lbs.	12	Bear Lake	Joe Sobczak	Wooley Bugger	2/9/97
Utah Chub			1.81 lbs.		Canyon Ferry Reservoir	Eugene Bastian	Rat Fink/Maggo ts	2/5/92
Walleye		35	17.75 lbs.	22	Tiber Reservoir	Robert Hart	Minnow	11/18/07
White Bass		17	2.80 lbs.	12	Missouri River South of Bainville	Vernon Pacovsky	Minnow	10/13/07
White Crappie		18.5	3.68 lbs.		Tongue River	Gene Bassett	Worm	5/10/96
White Sturgeon	■	75	96 lbs.		Kootenai River	Herb Stout		1968
White Sucker	■	21.625	5.33 lbs.	12.75	Nelson Reservoir	Fred Perry	Spear	2/10/83
Yellow Bullhead	■	14.0	1.62 lbs.	8.9	Ninepipes Reservoir	Frank Tepp	Lure	2/5/15
Yellow Perch		14.375	2.39 lbs.	12.1875	Lower Stillwater Lake	Josh Emmert	Jig	2/19/06

THERE'S A
BUCKET FULL
OF TROUBLE
IN MONTANA'S WATERS

AND IT COULD CHANGE
MONTANA FISHING FOREVER.

YOU HAVE A SAY:

REPORT OUTLAW FISH INTRODUCTIONS
1-800-TIP-MONT

REWARDS UP TO

YOUR IDENTITY WILL REMAIN CONFIDENTIAL.
YOU MAY BE ELIGIBLE FOR A REWARD.

\$19,750

TIP-MONT rewards plus pledges from Invasive Species Action Network, Walleyes Unlimited of Montana, Montana Catfish Association, Montana Trout Unlimited, Bass Nation, Bass Federation, Montana Pikemasters, & Fishing Outfitters Association of Montana.

MONTANA FWP

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