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Annual Fishing Newsletter

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FWP Administrative Regions and Hatcheries

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**Headquarters**
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Helena, MT  59601
406-444-2449

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406-752-5501

**Region 2**
3201 Spurgin Road
Missoula, MT  59804
406-542-5500

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406-454-5840

**Region 5**
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1 Airport Road
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406-228-3700

**Region 7**
352 I-94 Business Loop
Miles City, MT  59301
406-234-0900

**Butte Area Office**
1820 Meadowlark Lane
Butte, MT  59701
406-494-1953

**Havre Area Office**
2165 Highway 2 East
Havre, MT  59501
406-265-6177

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930 Custer Avenue West
Helena, MT  59602
406-495-3260

**Lewistown Area Office**
333 Airport Road, Ste. 1
Lewistown, MT  59457
406-538-4658

HATCHERIES

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

**Giant Springs Trout Hatchery**
4801 Giant Springs Road
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 West Pennsylvania Street
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
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**Fort Peck Hatchery**
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Conserving Wild Fish Habitat through Hydropower Mitigation

Matt Boyer, Science Program Supervisor

Aquatic habitat conservation is a long-standing principle of Montana’s wild fish management philosophy. Our success managing wild fish populations can be measured by how effective we are protecting and restoring their habitat. Without adequate water quality and quantity or sufficient habitat size and diversity, it’s not possible to sustain healthy fish populations and the outstanding angling opportunities they offer.

The Region 1 Fisheries Mitigation Program carries out work to protect and enhance fish species and their habitats affected by construction and operation of Libby and Hungry Horse dams. Aquatic habitat conservation and restoration projects comprise a significant portion of Bonneville Power Administration’s (BPA) hydropower mitigation investment in Montana. Fish, Wildlife & Parks biologists identify and implement fisheries mitigation projects using funds generated from the sale of electricity produced by the federal Columbia River hydropower system. In turn, BPA receives mitigation credit toward offsetting fisheries losses attributable to construction and operation of the dams.

One recent example of aquatic habitat conservation in the Flathead basin is acquisition of more than 3,000 acres in the Swift Creek drainage where a conservation easement protects in perpetuity critical habitat and water quality for native species such as bull trout and westslope cutthroat trout. The Flathead Valley is experiencing some of the most rapid population growth in the state and projects like this help proactively address aquatic habitat loss and degradation from real estate and commercial development.

Mitigation projects also use a variety of restoration approaches to improve quality and function of degraded habitat. Partnerships with US Forest Service staff on road culvert replacement projects provide some of the most immediate and apparent benefits for wild fish by restoring migratory fish passage and expanding access to adult spawning and juvenile rearing habitat. Forest regeneration work is also underway along the banks of the Flathead River to improve habitat diversity and fisheries productivity.
Operation of Libby and Hungry Horse dams for power generation and flood control dramatically impairs fisheries habitat quality and availability. Research conducted through the Fisheries Mitigation Program sheds light on how wild fish respond to the dam influenced habitat changes, helping dam operators manage for a more fish-friendly hydrosystem.

There are many parts to wild fish management, but a focus on conserving aquatic habitat may be the most important piece of it all.

Barriers and Opportunities for Wild Trout in the Upper Flathead River System

Amber Steed, Fisheries Biologist

It’s no secret that northwest Montana is a stronghold for wild, native fish like westslope cutthroat trout. These iconic fish called our treasured waters home long before Montana was a state or Lewis and Clark documented them on their voyage of discovery. Through wildfires, floods, and a changing landscape, the species earned its place as our state fish and favorite of more than a few anglers. Despite that resilience, their persistence is threatened by hybridization and competition with introduced, non-native rainbow trout as well as competition with eastern brook trout. While diverse efforts including hybrid relocation, piscicide treatments, research, and monitoring by FWP and partners have improved our understanding and conservation of this native wild trout, we can do more to protect cutthroat in drainages like the interconnected Flathead River system upstream of Flathead Lake for generations to come.

When considering how best to balance conservation and angling opportunity – ideally, achieving both – we study the range of options available, a.k.a., “tools in the toolbox.” While these tools tend to evolve over time, deciding if or when to use them can be tough. A prime example is the issue of isolating fish populations. While often seen as a last resort, constructing barriers can protect upstream fish from downstream invaders that threaten their persistence. But downsides can include the loss of migratory fish and genetic diversity in that stream, increased vulnerability to natural disturbances like wildfires, cost, and failure of the structure itself.

Libby Dam on the Kootenai River.

A fisheries technician stands beside an old road crossing and potential barrier location in Moose Creek, a tributary to the North Fork Flathead River.
Until recently, intentional fish passage barriers have not often been used in the upper Flathead River system. Examples aiming to protect westslope cutthroat trout and bull trout include installations by colleagues in the Quartz and Akokala drainages of Glacier National Park, following careful consideration of impacts. Building on those efforts, FWP recently explored if and where barriers might be appropriate across the broader upper Flathead stream network. With the goal of protecting genetically pure populations of westslope cutthroat trout in mind, we used a multi-phased approach to identify candidate streams.

Phase 1 focused on non-wilderness drainages, tossing out any with more than 1% hybridized cutthroat populations, bull trout, and non-native species. Now with a much shorter list of streams, we progressed to Phase 2 by comparing drainage size and barrier site suitability. This key step aimed to minimize those barrier pitfalls like structural failure, loss of genetic diversity, and population vulnerability. The bigger a stream network is above a barrier, the more resilient its wild fish residents are over time.

Phase 3 included collecting information from the largest candidate stream networks with good barrier sites that were relatively accessible. We gathered fish data using backpack electrofishers to estimate cutthroat densities, upstream distribution, genetic status (are they hybridized?), age structure, and evidence of migratory behavior. We also measured the streams themselves, including current and projected future seasonal temperatures, gradient, width, seasonal flows, and access for future monitoring. Again, all information to ensure that we focus on areas with the best chance of long-term success.

Ultimately, a few drainages emerged as good potential barrier candidates from the many dozens found in the upper Flathead System. Streams deemed unsuitable for barrier installation will continue to provide connectivity for our migratory wild fish, yet also remain vulnerable to threats posed by non-natives. Next steps include consulting with an experienced barrier engineer and public outreach to gauge community support in determining how we move forward. While not a decision we take lightly, we will continue to root the process in data-driven collaboration balanced with the desire to act while we still can.

Westslope cutthroat trout recovering after data collection.

Sometimes we get creative in accessing our sample sites. Here, we used personal transportation to haul equipment miles upstream by trail. Dare I say it was fun!
Noxon Reservoir Wild Bass Fishery
Jason Blakney and Travis Rehm, Fisheries Biologists

While western Montana is a lure for wild trout enthusiasts, a hidden gem of a wild bass fishery can be found in the lower Clark Fork River drainage in the northwest portion of the state. Noxon Reservoir, a 38-mile-long impoundment on the Clark Fork River, is home to both largemouth and smallmouth bass. It typically hosts six to eight fishing tournaments annually, with five-pound commonly observed. However, the bass fishing wasn’t always this good in the lower Clark Fork.

In the mid-1980s FWP worked with the utility company Avista and other stakeholders to eliminate large winter drawdowns that dried up much of the reservoir’s littoral zone. The littoral zone in a waterbody is the shallow, well lit areas where aquatic vegetation grows and may extend to depths of around 35 feet. The littoral zone is very productive nursery grounds for aquatic invertebrates like insects and crayfish, amphibians, many warm-water and cool-water fish species including bass, yellow perch, northern pike and pumpkinseed sunfish to name a few. Reducing the extent and timing of these yearly drawdowns helped stabilize habitat conditions which then led to increases in species dependent on littoral zone habitats through improved spawning and rearing success. As reservoir habitat improved and the fishery recovered, fishing pressure increased dramatically. Noxon is now one of the most popular fisheries in northwest Montana.

FWP and Avista have annually monitored bass tournaments on the reservoir since 1997. Tournament anglers compete for the heaviest combined weight of the largest five bass caught over 12 inches. Winning weights for the five fish bag limit can exceed 20 pounds and nearly all fish are released after tournament weigh-ins. The average largemouth captured in 2021 during tournaments was just over 16 inches long and just under 16 inches for smallmouth. Largemouth bass made up 80% of the tournament catch composition in 2021. “Quality” fish, categorized as fish over 15 inches made up 77% of largemouth and 59% of smallmouth caught by tournament anglers. “Memorable” fish, or fish greater than 18 inches comprised 12% of the catch composition for both species measured at tournaments.

The Noxon largemouth fishery is especially unique. Largemouth bass in northwest Montana are on the fringe of the species northern distribution, where populations are typified by slow growth and highly variable recruitment which is dictated by the region’s cool climate. Large-
mouth bass in the northwestern United States typically take 3-6 years to reach sexual maturity and large fish can be over 10 years old. Survival of largemouth bass through the first winter of life is size dependent, and successful recruitment and year class strength in northern populations is determined by growth of young-of-the-year (YOY) fish. Noxon Reservoir is a run-of-the-river impoundment, so spring and summer flow and temperature regime are dictated by spring-runoff from melting snow across the Clark Fork Basin. In the late 1990s, FWP compared YOY largemouth growth in Noxon Reservoir in two successive years with different run-off regimes; 1997 had high flows and low water temperatures and 1998 had low flows and warmer water temperatures. The 1998 year-class began hatching 12 days earlier, attained longer length and higher growth rates by hatching earlier in a year with warmer water temperatures. Water temperature was found to be the factor most influencing differences in growth between years in the study. Spawning and hatch date were later on Noxon Reservoir than what had been reported for other lakes in western Montana, between June 21 and July 3, in both low-water and high-water years.

This research led to regulation changes to protect spawning largemouth in Noxon. Bass rely on nest-guarding males to protect newly hatched broods and angling during that time may negatively influence recruitment. The general western district bass regulation protects spawning largemouth from the third Saturday in May until June 30. During this time, only one fish greater than 22 inches may be kept. Due to that later hatch date in Noxon Reservoir, the protective spawning dates were moved to begin and end later in the season, from June 15 to July 15. This regulation provides protection by limiting harvest of spawning and nest-guarding bass. Additionally, tournaments are not permitted during this time.

Spring sunset on the Clark Fork River-upper Noxon Reservoir, just west of Thompson Falls.
Are Wild Fish Self-sustaining?
Pat Saffel, Regional Fisheries Program Manager

To help answer my question we should explore the meaning of “wild” and “self-sustaining.” First, however, “wild” and “self-sustaining” are sometimes interchanged as meaning the same thing, or they are mentioned together to add further definition to the phrase. But what do we mean by “wild” and “self-sustaining”? “Wild” is intuitively the simpler term of the two but may be the more nuanced. To me, “wild” means not being domesticated. In the fisheries profession, domestication occurs when a portion of a fish’s life cycle is spent in an artificial environment, such as eggs in an incubator or fish raised a year or two in a hatchery. The more time in an artificial environment, the more domesticated the fish. To be “wild” can easily be stated as not having any domestication, but there are degrees of wildness. A young fish that is hatched from an artificially fertilized egg and raised for a few months in a hatchery that then spends the next several years of its life in the wild is a very wild fish. On the other hand, “self-sustaining” simply suggests that fish are responsible for their entire life cycle. So, self-sustaining is the most wild, wild can be. Therefore, wild self-sustaining fish are entirely supported by the natural world and there is no intervention by people.

Hmmm…. no intervention by people, I say? This is where my definition of “self-sustaining” gets a little grey, and where FWP steps in. FWP plays a crucial role in supporting wild self-sustaining fisheries. You could say that managing these fisheries depends on three factors: habitat, habitat, habitat (I stole this from the real estate value axiom of location, location, location…). In essence, habitat drives fishery management, and FWP is very active in managing habitat throughout Montana.

Protection is the most effective way to manage habitat. FWP personnel regularly protect habitat by reviewing, modifying, and permitting river and stream projects. Over 1,000 such projects are assessed each year by FWP. Additionally, over 500 projects by other agencies and private fish ponds are commented on or permitted. Much time is spent working with public and private parties to find creative solutions to meet their interests and protect fish habitat. Protecting habitat, and the fisheries that rely on it, is our best bet in maintaining our wild self-sustaining fisheries.

Another axiom often stated is “protect the best and restore the rest” and takes us to a second aspect of our work that supports wild self-sustaining fisheries. FWP spends considerable time and money restoring habitat, most notably through its Future Fisheries Improvement Program. Over 200 projects have been completed in the past decade, with about $600,000 per year coming from FWP to support the projects.

Habitat improvement projects, both big and small, are supported by FWP time, money, and information. On the left is a fish ladder at the mouth of Marshall Creek that allows adult fish to enter and spawn in the creek. On the right is the removal of Milltown Dam on the Clark Fork River that blocked hundreds of thousands of fishes including trout. Both projects improved the ability of wild fish to be self-sustaining.
Improving damaged habitat through physical changes or simply by improving land and water management is an important aspect of wild fishery management.

Managing wild, self-sustaining fish populations would be much less effective if we didn’t understand our fisheries. FWP regularly collects information regarding fishery status. This knowledge helps us prioritize what habitat to protect, where and how to improve habitat, and indicates trends in the fishery. Trend information is useful to understand how fisheries respond to anticipated or unanticipated changes. For example, changes in fishery status can happen with prescribed harvest regulations or an accidental pollution event. Knowing that a fishery has changed, as well as why, is important to meeting management goals set by FWP and the public. Native trout conservation projects that establish new populations are a great example of how FWP increases the number of wild self-sustaining fisheries. An example of this is trout projects that put native fish into habitats that previously had non-native fishes.

A couple of objectives are met by doing this work. First, we are conserving native trout so that we continue to have fish species historically found in Montana. This helps us keep Montana the Montana we know. Also, these projects choose places where the native trout will do better than the non-natives. Putting native trout in these habitats and removing the non-natives that compete with them enhances wild self-sustaining trout populations. FWP supports wild self-sustaining fisheries in many ways. Mentioned here are just a few. Investment in this approach has resulted in world renowned fisheries and has attracted anglers from across the US and the globe, not to mention contributing to a high quality of life for Montana residents. Fishing in an environment that has wild self-sustaining fish and the habitat that supports it adds to the angling experience by putting the angler in the fish’s natural environment rather than our own. This helps people connect with nature, and to ourselves. However, “self-sustaining” is a bit misleading. FWP plays a vital role in sustaining, self-sustaining wild fisheries in Montana.
FISHING NEWSLETTER
2022

Mountain Whitefish and the “Other” Wild Fish in the Upper Clark Fork River
Nathan Cook, Fisheries Mitigation Biologist

FWP have been studying the brown trout population in the Clark Fork River near Deer Lodge since the early 1970s. These population estimates have tracked trout population trends in the largest Superfund site in the U.S. long before the massive cleanup efforts currently underway were even considered. Despite some serious improvements in the water quality of the river, brown trout numbers are still well below our restoration goal of 1,000 fish per mile. To help understand factors limiting to trout, FWP has partnered with the University of Montana to study...mountain whitefish?

FWP fish surveys of the Upper Clark Fork have focused on trout for good reason. Trout are excellent indicators of the health of an ecosystem and trout are what most anglers are interested in catching. The trout fishery near Deer Lodge is 95% brown trout, although westslope cutthroat trout, brook trout, rainbow trout, and the rare bull trout can also be found. But trout as a whole are just a fraction of the entire fish community, which also includes mountain whitefish, suckers, sculpin, longnose dace, and sand shiners. So, to really understand how Superfund cleanup and restoration can improve fish habitat in the Clark Fork River, we need a broad understanding of habitat that includes as many species as possible. Taylor Gold Quiros, a PhD student at the University of Montana, is seeking to do just that; to study all the fish present in the Upper Clark Fork River, how they interact with each other, and how habitat factors affect them. To accomplish this, Taylor is working with FWP to sample as many different species as possible. We are also generating abundance estimates for mountain whitefish to complement the trout estimates that FWP already conducts. These whitefish estimates will be done for three years in 2021-2023. Although whitefish estimates have been done on other rivers such as the Blackfoot and Yellowstone, as well as in other states, we are lacking information about whitefish abundance in the Upper Clark Fork River. Mountain whitefish estimates in the Clark Fork from 2021 ranged between 660-1050 fish per mile. For comparison, trout estimates in FWP’s seven sampling sections between Warm Springs and Rock Creek ranged from 38-216 fish per mile in 2021. It is clear that mountain whitefish greatly outnumber brown trout in the Upper Clark Fork.

As the most abundant fish in the Upper Clark Fork River, mountain whitefish deserve our attention. Mountain whitefish are important prey for brown trout and these two species also feed on some of the same aquatic insects. Understanding more about how whitefish interact with trout will shed light on habitat and other limitations affecting the whole fish community in this impacted river system.

A mountain whitefish is measured and weighed before being released back into the river. Information about mountain whitefish abundance and growth will complement FWP’s extensive dataset on trout.

A mountain whitefish in the shallows of the Clark Fork River.
A Primer on Mountain Lakes and High Elevation Trout Fisheries in Western Montana

W. Ladd Knotek, Fisheries Biologist

Unlimited high elevation adventure awaits anglers, hikers and other recreationists that want to explore mountain lakes in western Montana. Every major mountain range and most large watersheds in western Montana are dotted with hundreds of alpine and subalpine lakes. Although high elevation trout fisheries are the draw for most folks, almost half are fishless and are visited by other recreationists to experience their scenic beauty and some genuine solitude.

While coldwater rivers and streams continue to support increased fishing pressure and various levels of crowding, mountain lakes can offer an alternative experience. For some perspective, just the Middle Clark Fork and Clearwater areas near Missoula support more than 140 lakes larger than 1 acre and above 5,000 ft elevation. Although most of these waters are fairly shallow and less than 15 acres, maximum depth and surface area vary significantly. Several mountain lakes in this area exceed 40 acres and 100 feet deep. Access to high elevation lakes varies considerably – some can be reached directly via roads and motorized trails, while others require a considerable trek on non-motorized trails or cross-country travel where no formal trails exist. Regardless of access route, elevation, weather, and snowpack generally limit the season of use, so plan on summer through early fall for most locations.

Mountain Lake Fishery Management

Most mountain lakes were historically stocked (liberally) with various trout species such as cutthroat trout, brook trout, rainbow trout and others in the early to mid-1900s. Primarily through trial and error, early Fisheries managers found that trout populations were only viable in 50-60% of all mountain lakes because they require adequate depth and spawning habitat quality for trout to consistently overwinter and reproduce. The rule of thumb is that at least 10 feet of depth is needed for reliable trout survival, but spring activity and other local factors produce the occasional exception.

Mountain lakes that currently support viable fisheries generally fall into two classes: (1) those that are completely self-sustaining through natural reproduction and (2) those that are maintained or enhanced through periodic stocking. This distinction, along with variation in the species present and the range of physical settings and access, result in a variety of options for anglers (see fishery categories below).

Categories of mountain lake fisheries in the Missoula area.

- **Wild Westslope Cutthroat Trout Fisheries**
  - 17 (25%)
- **Wild Brook Trout Fisheries**
  - 20 (29%)
- **Wild Rainbow & Yellowstone Cutthroat Trout Fisheries**
  - 11 (16%)
- **Stocked Westslope Cutthroat Trout Fisheries**
  - 21 (30%)

Lakes with consistent inlet streams and other suitable spawning habitat tend to support self-sustaining trout populations that don’t rely on stocking. These situations typically produce abundant trout and high angler
catch rates. Unfortunately, high fish densities at these elevations typically come with a price: stunted trout. Because most mountain lakes naturally have limited food, productivity, and growing season, abundant trout populations experience slower growth rates and restricted size structure.

Stunting can develop with all trout species, but is particularly prevalent for brook trout populations because their spawning habitat requirements are ‘plastic’ - they can successfully spawn in lake inlets, outlets, shorelines, or about anywhere with some gravel. The result is consistent and abundant reproduction, which leads to stunted trout populations. For reference, out of 20 mountain lake brook trout populations in the Missoula area, 18 are stunted with a maximum length of 11 inches. All indications are that these populations have been stable and stunted since the mid-1900s when brook trout were sprinkled in waters across the region.

Spawning requirements for other trout species, such as westslope cutthroat trout, are more rigid, which can allow some control over fish density and growth rates when spawning habitat is limited. Since there are very few mountain lakes where no natural reproduction occurs, prescribed stocking rates generally start low. A typical scenario for westslope cutthroat trout fisheries is a 20-30 fish/acre stocking rate planted every 5-7 years. The expectation is that sporadic natural reproduction will supplement scheduled plants and promote stability. Populations and the stocking prescription are then monitored through periodic sampling and adjusted accordingly. In other words, the stocking rates, timing, and other methods currently used for each lake in the planting program were developed over time through monitoring and iterative adjustments. Through this process, quality and trophy trout fisheries were developed and sustained as a subset of mountain lakes where prolific natural reproduction doesn’t override the ability to manage for larger fish.

In the end, the range of different natural settings, stocking histories, and considerations associated with mountain lake management results in DIVERSITY. With some exploration, anglers and recreationists can find about any type of mountain lake adventure or opportunity they desire.
**Westslope Cutthroat Trout: Fish Species of Choice for Most Mountain Lakes**

Mountain lakes in Western Montana were originally stocked with a range of trout and other fish species. Many of these fisheries persist today as self-sustaining populations where natural reproduction is common. Unfortunately, biologists found that most introduced trout species did not perform well in mountain lakes, either because of prolific reproduction and stunting (e.g., brook trout) or because they aren’t physiologically built to thrive in very sterile, coldwater environments with short growing seasons (e.g., rainbow trout).

For those lakes supplemented with stocking, FWP has gradually shifted to a program that emphasizes westslope cutthroat trout in western Montana for a number of reasons. First, as described above, westslope cutthroat simply grow and survive better in mountain lakes relative to other introduced trout that originated in other parts of the country. Westslopes are also less likely to overpopulate as spawning requirements are generally more stringent than other trout species, allowing managers a better opportunity to control densities, growth rates, and size structure. Ecologically, westslope cutthroat are the native trout that originally inhabited Western Montana watersheds (along with bull trout), so they are naturally more compatible with native fish populations downstream. This has been an issue with other trout species introduced into headwater lakes, as stocked fish consistently trickle out into stream systems below the lakes. Fisheries managers have addressed this concern by developing a genetically pure, diverse stock of westslope cutthroat in the hatchery system that is derived from natural populations across Western Montana.

**Access, Public Use, and Mountain Lake Fisheries**

Recreational pressure at mountain lakes is definitely not uniform. There is no doubt that the historic distribution of fish introductions and continued management of lake fisheries affect the current distribution and level of recreational use. This is evident in aspects ranging from the location of trail systems, campgrounds and roads to estimates of angling pressure and evidence of human disturbance along lakeshores. FWP lake surveys and anecdotal information suggest that: (a) road-accessible lakes support the heaviest use and human disturbance, (b) fish-bearing lakes experience more use and disturbance than fishless waters, (c) fish-bearing lakes are more likely to have established campsites and fire rings than fishless lakes, and (d) long standing fish-bearing lakes are more likely to be accessible by maintained trail systems or roads.

When planning a trip into a high elevation lake, physical characteristics/setting and fishery status are two of the most important features to consider. The others are ease of access and fishing pressure, which go hand-in-hand. Mountain lakes that are directly accessible by road or lie just above a major trailhead are bound to have high use – particularly if fishing is good. On the other hand, you’re going to work a lot harder, but are unlikely to encounter competition at waters that lie off the beaten path with no maintained trail access. Most mountain lakes lie somewhere in the middle of this effort/reward scale.

Levels of access and fishing pressure also directly affect the quality and consistency of mountain lake trout fisheries. Relatively sterile, high elevation waters do not produce fast growth rates relative to lower elevation lakes and rivers, so easily accessible, popular fishing lakes can get frustrating for anglers, even with high stocking rates. Fisheries managers adjust to high fishing pressure on ‘quality’ fisheries by increasing the frequency and number of fish stocked, but it’s difficult to keep up with high harvest rates when trout growth rates are so slow. Some alternatives are to visit lakes that support wild brook trout when harvest is the objective or seek out lakes with cutthroat that are more difficult to access for a chance at larger fish.

**Fishless Lakes Have Recreational and Intrinsic Value**

Many mountain lakes are just too shallow or unsuitable to overwinter trout populations (e.g., < 10 ft max depth). Some others are intentionally not stocked to promote biodiversity and to maintain unique aquatic communities. In other words, we know that nearly all mountain lakes were historically fishless, and without introduced top predators like trout, other unique native species like amphibians, aquatic insects, and plankton can thrive.

There is no doubt that introducing trout or other top predators significantly changes the natural character of a mountain lake. Fishless lakes may seem like a waste of good opportunity to many anglers, but in reality, lakes that remain fishless offer a unique environment for other species and for other recreationists
that may not prioritize a tug on the end of their line or seeing lots of people. Thankfully, in the mountains of Montana, there is plenty of room for outstanding trout fisheries and pristine aquatic systems where people are an infrequent visitor.

More Info: Reports containing comprehensive survey information and management recommendations for Missoula area mountain lakes and other areas are available through FWP regional offices and Fisheries Management staff.

Rock Creek
Brad Liermann, Fisheries Biologist

Rock Creek is a world class trout fishery which also supports a robust native fish community including large river-dwelling westslope cutthroat trout. Westslope cutthroat trout comprise a major component (approximately 40%) of the trout sport-fishery in the Upper Rock Creek drainage. While westslope cutthroat trout are found in lower densities lower in the drainage, these populations still provide quality angling opportunities with angler catch rates of this species being quite high in comparison to their abundance.

Understanding native fishes’ migratory behaviors is a key component of properly managing these species. Spawning migrations are obviously an important period in a native fishes’ life as the successful completion of spawning is imperative to sustaining populations. Due to the long distances typically traveled by river-dwelling westslope cutthroat trout to spawn in their natal tributaries, they commonly encounter difficulties in completing these migrations and may not even survive. Monitoring these migrations often identifies causes for mortality/impairment that may be improved via restoration such as screening an irrigation diversion or removing a culvert barrier. Identifying key spawning habitat also allows managers to better protect these habitats and may provide a way to identify and prioritize areas in need of restoration or protection. Radio telemetry was used to understand spawning migrations of westslope cutthroat trout in Rock Creek.

Relocations from 2018 and 2019 radio telemetry monitoring yielded some interesting results. Multiple tributaries were identified as key spawning tributaries with those located in the middle and upper portions of the Rock Creek Drainage being most used by spawning fish. Surprisingly, multiple fish also used the lower portions of larger tributaries to spawn. Generally native trout spawning in Montana occurs primarily in upper portions of drainages where the highest quality habitat is typically found.

Each implanted fish was also genetically tested to determine if a fish was a native cutthroat or hybridized with a non-native fish. Results of these genetic analyses showed that adult westslope cutthroat trout were commonly non-hybridized fish. This was another result that was surprising to biologists due to mainstem Rock Creek maintaining high densities of rainbow trout.

These results led to a shift in study objectives in 2020. The new focus was on understanding how a large portion of this population is avoiding hybridization and also assessing differences between westslope cutthroat trout that migrate either short or long distances to their spawning tributaries. Methods used to assess this included a combination of radio telemetry, tributary genetic analyses, and tributary electrofishing. This portion of the telemetry project was completed cooperatively between FWP and the University of Montana. Results indicate that westslope cutthroat trout that migrate the furthest tend to spawn lower in tributaries, making them more susceptible to hybridization with rainbow trout and hybrids. Some additional results indicate that tributaries with high adult abundance and higher stream flows may be producing a higher proportion of long migrants than expected. Further analysis of this data will be completed by the University of Montana in coming months and will likely provide some additional conclusions useful for managing these populations.
If you are new to Montana or new to fishing, you may not be aware of what makes Montana’s famed trout rivers, like the Bitterroot, so special. Perhaps you’re aware of the beautiful scenery, abundant access points, or wonderful bug hatches, but did you know that every fish you catch on the Bitterroot is 100% wild? You might be asking, what do you mean by wild? By wild I am referring to the fact that all of the fish in the Bitterroot River and its tributaries were hatched and raised there. While wild does not necessarily mean native, it does mean that we do not supplement the fishery with any fish raised in a hatchery.

In the Bitterroot River and its upper Forks, the presence of fallen trees and log jams creates some of the best available habitat for fish. This woody debris also plays an important role in the way the river functions. But this same woody debris can also pose serious risks to those who utilize and recreate on the river. Because of this, it has been a common practice over the years for individuals to cut or remove woody debris to improve boat passage without first obtaining necessary stream permits before doing the work. The main permit in question is the 310-permit defined in the Natural Streambed and Land Preservation Act of 1975, often referred to as the 310 law. The 310 law was enacted to protect and preserve Montana’s rivers and streams, and it does this by requiring prior authorization from the local Conservation District (CD) before any work can be done within or around a stream or river. Before issuing a 310 permit, the CD, in consultation with a representative from FWP, must first ensure that any potential negative impacts from the proposed work are avoided or minimized. The primary reason for this is to protect habitat for our wild fisheries.

This is not the case in other states where some of their popular river fisheries are supported largely by supplemental stocking. While we do plant many lakes and reservoirs with hatchery reared fish, our rivers and streams are different. This management strategy has been employed by the state for nearly 50 years now, and it has been incredibly successful. A management strategy that focuses on wild fish tends to focus heavily on habitat management. Wild fish need high quality habitat to survive and contribute to the next generation. Protecting and improving habitat requires an understanding and buy-in from many people, especially those that regularly interact with and have an impact on the resource.
Recognizing the potential impacts of unpermitted cutting in the Bitterroot River and its upper Forks, FWP and the Bitterroot Conservation District (BCD) formed the Woody Debris Task Force in late 2019. The intent of the Task Force was to identify and implement ways to address the issue in the watershed. The Task Force includes representatives from FWP, BCD, U.S. Forest Service, Ravalli County, local fishing outfitters, Trout Unlimited, and the general angling public. While these members bring a diverse range of backgrounds and perspectives to the table, they all share a strong interest in protecting the Bitterroot River and its fishery. This has helped to create a collaborative team intent on finding solutions. To date, the Woody Debris Task Force has focused extensively on education and providing information to the public and those who commonly use the river about the benefits, but also the risks, associated with woody debris, as well as the need to get a 310 permit before doing any work in the river. Additionally, the Task Force has completed several field surveys in the upper Bitterroot in an effort to identify potential concerns, and where it was appropriate, came up with possible actions that could be taken to mitigate the hazards without negatively impacting habitat or stream dynamics. This process has been very beneficial and educational to all parties involved and is a good model of working together to find collaborative solutions. While unpermitted cutting has not gone away, early indications are that compliance with stream permitting laws has improved since the Woody Debris Task Force was created. If you are interested in finding out more information about the Task Force, or why protecting woody debris is important for our wild fisheries, please contact FWP or the Bitterroot Conservation District.

**Happenings in the Upper Clark Fork**

*Caleb Uerling, Fisheries Biologist*

**Cutthroat are up in the Upper Clark Fork River**

Every year FWP samples trout populations along the Upper Clark Fork River to monitor trends in trout populations. One trend we monitor is how our native westslope cutthroat trout are doing. We have an objective to attain 10% native trout in the Upper Clark Fork. Historically, we catch too few cutthroat in our sections above Deer lodge to get a population estimate, and we find 1-3% of the population between Deer Lodge and Gold creek is made up of cutthroat. However, from 2019 to 2021 we found westslope cutthroat making up 5-16% of the population (Figure 1). These higher estimates are largely due to improved flow. Good flow years from 2018 through 2020 saw westslope cutthroat respond positively to high flow because fish could access more habitat for spawning, rearing, and out-migrating. Other factors that may play a role in increasing cutthroat abundance include improving water quality due to upstream remediation, increased recruitment tied to restoration efforts in the tributaries, and decreased competition with brown trout due to low brown trout populations over the last five years. While these increasing cutthroat populations are a good sign, the harsh conditions in the summer of 2021 likely took a toll on fish populations. Continued work to increase flows, restore connectivity in the tributaries, and remediate the Upper Clark Fork will be essential to consistently reaching the 10% native fish goal going forward.

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overpopulated with cutthroat and the fish are stunted. The average adult fish observed during 2020 gill net surveys was only slightly over 10” long and weighed .35 pounds. Beginning in 2022 the fishing regulation for Basin Creek Reservoir will be one westslope cutthroat daily with one in possession, and artificial lures only. The reason for this regulation is to try to manage for slightly lower densities and therefore larger size cutthroat, while maintaining a fishery supported by wild reproduction rather than stocking. Starting with a conservative regulation will allow FWP to evaluate the effects of harvest on the fishery while not worrying about over harvesting this unique fishery, as cutthroat are typically easy to catch and can be easily overharvested. Ongoing restoration of spawning and rearing habitat in the drainage and an evaluation of the current regulation could lead to a more liberal harvest regulation in the future. In the meantime, anglers can expect high densities of pure westslope cutthroat in Basin Creek Reservoir. In addition to FWP regulations, anglers should abide by Butte Silver Bow Parks and Recreation rules for the reservoir to maintain access into the future.

Western Montana’s new publicly accessible fishery

Basin Creek Reservoir is located about 13 miles south of Butte. The reservoir was constructed in the late 1800s and for decades has remained off limits to the public because of concerns for water quality. Basin Creek Reservoir holds the city of Butte’s largest and highest quality source of drinking water. The reservoir will now be open to the public from Memorial Day through October 1 each year. The public access was facilitated by the funding of a new water treatment plant that treats water for municipal consumption from the reservoir. However, maintaining water quality at the reservoir is still a main priority and any activity by the public that jeopardizes water quality, such as wildfire hazards, invasive species introductions or unauthorized motorized use, could lead to the reservoir being closed to public access.

When the reservoir was constructed in the late 1800s a pure population of westslope cutthroat trout were isolated above the reservoir. This population now occupies the reservoir and associated streams and has maintained itself through wild reproduction for over 100 years. Due to the success of these wild fish spawning in the inlet to the reservoir, and historically no mortality associated with angling, the reservoir has become the drainage and an evaluation of the current regulation could lead to a more liberal harvest regulation in the future. In the meantime, anglers can expect high densities of pure westslope cutthroat in Basin Creek Reservoir. In addition to FWP regulations, anglers should abide by Butte Silver Bow Parks and Recreation rules for the reservoir to maintain access into the future.

A spawning westslope cutthroat trout from Basin Creek Reservoir captured in Basin Creek above the reservoir. This fish is representative of an average adult inhabiting the reservoir currently.
New Bank Treatments Coming to the Upper Clark Fork

In 2012 the Montana Department of Environmental Quality (DEQ) and The Montana Natural Resource Damage Program (NRDP) began cleaning up and restoring the heavy-metal contaminated soils in the floodplain and banks of the Upper Clark Fork. There are 22 phases of this cleanup spread from Warm Springs to Garrison. Between 2012 and 2021 they cleanup activities were completed on two phases near Warm Springs, two near Racetrack, and two just below Deer Lodge. In 2021 work began on a seventh phase just below Perkins Lane.

A common complaint heard by DEQ, NRDP, and FWP from the public regarding the first six phases was that cleanup was removing bank cover and habitat used by fish and not building back sufficient habitat. In the first six phases the bank was generally built back using a design known as a double vegetated soil lift, essentially soil wrapped in coir (coconut) fabric with dormant willow clippings incorporated. The idea behind the double vegetated soil lift is that the coir fabric roll gives the bank short term stability and resistance to erosion while the willows and other vegetation can take hold. In roughly five years the fabric erodes, hopefully leaving behind a vegetated bank that is starting to form woody overhanging cover and complex bank habitat. Many banks are still in the intermittent phase between construction and when vegetation has grown enough to provide complex habitat, leaving the river with a uniform bank that isn’t providing fish with enough cover and complex habitat.

Starting with the phase currently under construction anglers can expect to see some new bank treatments incorporated into the cleanup. The new banks will incorporate modern bank restoration techniques using large wood, vegetation clumps, and willow clippings for stability instead of coir fabric. These new banks should provide drastically more immediate habitat and overhanging cover, and also enough stability to allow vegetation to take hold and banks to mature. The new bank treatments are being used extensively in the current phase, with double vegetated soil lift treatments being reserved for high stress banks where erosion potential is high. FWP, NRDP, and DEQ will be monitoring the new banks going forward to help understand how they perform in the short term and long term.

A freshly built double vegetated soil lift along the Upper Clark Fork River.

A new bank treatment using large wood and other native material being built on the Upper Clark Fork River.
The Central Fishing District includes all waters in Montana east of the Continental Divide, (including the Belly and St. Mary’s River drainages) and west of the following described boundary: Interstate 15 from the Montana-Canada border south to its junction with Hwy 2 at Shelby, then east on Hwy 2 to Chester, then south on Hwy 223 to State Hwy 80 at Fort Benton, then southeasterly along State Hwy 80 to its junction with State Hwy 81, then easterly on State Hwy 81 to its junction with U.S. Hwy 191, then northeasterly along U.S. Hwy 191 to its junction with State Hwy 19, then south on State Hwy 19 to its junction with U.S. Hwy 87 at Great Falls; then south on U.S. Hwy 87 to its junction with State Hwy 12; then west on U.S. Hwy 12 to its junction with State Hwy 3 at Lethbridge. Then south on State Hwy 3 to its junction with Interstate 90 at Billings, then easterly and southerly on Interstate 90 to the first crossing of the Little Bighorn River, then southerly along the west bank of the Little Bighorn River to the Montana-Wyoming border.

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 in this fishing district, please call the following regional headquarters Monday-Friday 8:00 a.m. - 5:00 p.m.:

- Billings......................................................... 406-247-2940
- Bozeman..................................................... 406-577-7900
- Butte Area Office........................................ 406-494-1953
- Great Falls.................................................. 406-454-5840
- Helena Area Office....................................... 406-495-3260
- Lewistown Area Office............................... 406-538-4658
- TTY (Telephone device for the deaf)............... 711 or 1-800-253-4891
A New Way to Estimate Trout Abundance in the Upper Yellowstone River
Scott Opitz, Fisheries Biologist

Since the early 1980s FWP has monitored the abundance of trout in a few sections of the Yellowstone River using the same methods, and on the same dates in the spring. However, because of the change in the timing and duration of spring snow melt run off, it has become increasingly difficult in the last 20 years to consistently get accurate estimates. Since these estimates are important to biologists and to the public, FWP is working with the Montana State University to evaluate a new technique that uses individually tagged fish to continue to provide accurate estimates of abundance.

Traditionally FWP would electrofish a section of river and mark all trout captured and release them back into that same section of river. Then we would wait a week or so to let the fish recover and redistribute themselves, then electrofish the same section of river. Based on the number of marked and unmarked fish captured, an estimate of how many fish were in the river section can be calculated. This mark-recapture monitoring can take about two weeks for each section. On the upper Yellowstone enough flow is needed to safely operate a jet boat and effectively capture fish, but too much flow reduces effectiveness of capturing fish and can be unsafe for FWP crews.

Historically spring low land runoff started earlier and lasted longer. This allowed enough time with ideal sampling conditions to complete mark-recapture monitoring. Currently spring low land runoff starts around two weeks later, flows are increasing faster, and peak flows are occurring sooner. These changes have reduced the window of time to complete monitoring. With shorter time frames to complete this work it is becoming increasingly difficult to conduct this form of monitoring.

Since these new flow regimes are expected to continue, the department is exploring other ways to estimate fish abundance. This past spring, we tagged thousands of trout with a small, individually identifiable permanent electronic tags (PIT tag) which can be identified with a scanner. This will allow tracking the individual history of each fish and use different statistical methods that are not tied to discrete dates to estimate the abundance of trout.

If this method works, it will be used on other rivers in Montana that are facing similar challenges.
2021 was a busy year for southwest Montana westslope cutthroat trout conservation. Three large projects in the Big Hole, Upper Missouri, and Gallatin River basins wrapped up their second complete years of fish removals with rotenone. When successfully recolonized with native fish, these streams will provide approximately 65 miles of secured habitat for naturally reproducing, aboriginal cutthroat. Other smaller projects in the Beaverhead and Big Hole drainages were initiated which will help secure at-risk populations of westslope cutthroat from non-native fish. FWP staff also successfully moved at-risk cutthroat from six streams with no barriers into fishless habitat above barriers. This will preserve unique local genetics and the fish can then be used to repopulate larger projects in the future. In one case, Long Branch Creek in the Big Hole was confirmed to be fishless this year using Environmental DNA (eDNA) after two years of treatment and was re-stocked in 2021 using other local populations of unaltered westslope cutthroat.

From inception to repopulation, a successful fish removal project can take 4-10 years to complete. The timeline depends on the complexity and size of the project. A great example of success is the Greenhorn Creek project in the Ruby River basin. Twenty-six miles of stream were treated with rotenone in 2013 and 2014 to remove hybrid rainbow trout. In 2015 the stream was confirmed as fishless using eDNA and electrofishing surveys. Repopulation began in 2016, and a total of 692 westslope cutthroat from six local populations were stocked into Greenhorn Creek over the next three years. Once complete, these cutthroat trout projects require little to no maintenance as the new populations are entirely sustained by natural reproduction.

We continue to learn and adapt our methods for native fish conservation using rotenone. However, in recent years the use of eDNA and careful attention to detail have allowed a greater number of these projects to be successful. We do not re-stock streams until we have assurance that they are fishless. These successful projects have brought us closer to our overall goal of restoring westslope cutthroat trout to at least 20% of their historically occupied habitat. Although we continue to lose some small, at-risk populations each year, we are working to preserve as many populations as possible and the larger removal projects allow us to gain ground and increase the distribution of this great fish. In 2022, we will begin the repopulation process on 2-3 newly fishless streams which will eventually provide 35 miles of habitat for unaltered westslope cutthroat trout.
The drought of 2021 was the largest test to date of the Arctic grayling Candidate Conservation Agreement with Assurances (CCAA) programs in the Big Hole and Centennial valleys since their inception. The combined factors of below average snowpack (especially at mid and low elevations), above average spring temperatures, and record low June precipitation took its toll on the rivers of southwest Montana. Conditions going into the summer were similar to those experienced in 1988 when the Big Hole River channel at Wisdom Bridge went completely dry for 28 days. However, due to the commitment of the CCAA enrolled landowners in the upper Big Hole Valley, the channel never went dry despite even less summer precipitation in 2021 than 1988. Overall, greater than 160 cubic feet per second (cfs) were voluntarily returned to the river throughout the course of summer. Many landowners went entirely without irrigation withdrawals due to low water availability. Certainly, we would all have appreciated greater flows and cooler temperatures, but under the most extreme drought test, the CCAA program proved that enrolled landowners stand fully on the side of conserving the Big Hole River and the Arctic grayling that dwell within it. Despite less than 5 cfs at the Wisdom Bridge for most of the summer, the river never dried up and this allowed grayling to move to areas of deeper, cooler water. These conservation actions also benefitted the lower Big Hole which has a highly important recreational fishery. In 1988, August flow at Melrose averaged 88 cfs with a recorded low of 55, while in 2021 the August average was 203 cfs with a recorded low 168 cfs. That is a significant improvement! The true benchmark for the program is the grayling population. Grayling are not stocked in the Big Hole River and the population is maintained entirely by natural reproduction. Going into this summer we knew we had a healthy population as the species was captured throughout the entire river during spring sampling. Arctic grayling in the Big Hole River were distributed all the way down to the confluence with the Beaverhead River and high numbers of spawning adults were captured in the upper river. However, no one knew if young-of-year grayling would successfully recruit to the population given the hot, dry conditions throughout the basin. Grayling hatch in late-May and must grow 4-5 inches throughout the summer to successfully over-winter. We monitor the population by collecting YOY grayling at known spawning locations and use genetics to determine the number of adults which produced the yearclass. Though flows were some of the lowest ever recorded and overall habitat conditions were worse than usual, we found YOY and adult grayling in nearly all locations and most were at or above average densities. Although we won’t have the official estimate (using genetics) until this winter, it is certainly a great sign for the species. This is the direct result of the CCAA program which has improved aquatic and riparian habitat, removed barriers to fish passage, and generally kept more water in the river. Though 2021 will go down as an exceptional drought year that we hope to never revisit, the CCAA program has proven that we’ve provided more options and greater habitat for Arctic grayling to persist.

To prepare for future drought years, the CCAA team has completed one of the largest habitat and infrastructure project years to date. By runoff of 2022, we’ll have replaced seven irrigation diversions in the Big
Hole that provide more efficient irrigation withdrawal and control for improved instream flow and fish passage. We’ll also have completed two major fish passage projects to increase habitat connectivity on 3+ miles located on Engeljard Creek, a tributary to the upper Big Hole River. In addition, we’ll have stabilized over 500’ of streambank with willows to improve shading and reduce sediment loading, and we’ll have built over 2 miles of new fencing to improve riparian habitat and grazing management. Lastly, we’ll have improved three stock water systems and built one entirely new stock water system to improve instream flows and riparian habitat. In the Centennial Valley, we’ll also have completed over a half mile of new channel restoration for improved grayling spawning habitat through three restoration projects. We’re gearing up and have our sights honed-in for 2022 to get more projects on the ground that will add to the success of the CCAA program and Arctic grayling recovery.

**Habitat and Resiliency in Wild Fisheries**

Improving habitat can improve resiliency of wild fish populations and the upper Beaverhead River and Poindexter Slough provide good examples. The foundation of wild fish management lies in providing the habitat fish need to complete their life cycle. Resultantly, wild fish management is heavily focused on management of wild fish habitat. One important aspect of fish habitat is often the quantity of water in the streams they live in. This is especially true in southwest Montana where relationships between fish and stream flows have been well-established for decades and targeted management and conservation programs developed around them. However, in recent years we’ve observed near historic lows in fish abundances in streams that didn’t have historically low flows. Ongoing work is investigating what other factors may be at play, but it appears that higher quality physical habitat may help buffer their effects. On the upper Beaverhead, FWP works with the Bureau of Reclamation and irrigators from the East Bench Unit Joint Board to deliver periodic flushing flows to attempt to improve habitat over a large area. These flushing flows are intended to mimic a natural flow regime in a dam-controlled system to create and maintain the physical habitat trout need – gravel riffles and well-scoured pools without too much sand and silt. Flushing flows are delivered following excessive sediment input from tributaries or, if there is adequate water in the system, at the onset of the irrigation season in the spring. Analysis of substrates and habitat features indicates that flushing flows delivered in 2017-2020 successfully mobilized and transported fine sediment from riffles and pools in the upper tailwater. Further downstream in Poindexter Slough, flushing flows are also an integral part of FWP’s habitat management approach. Extensive restoration work was completed by the Beaverhead Watershed Committee throughout the slough’s 4.7-mile length from 2014-2016 to improve the number of fish over 18”. While construction immediately built better physical habitat, flushing flows are required to protect and maintain it. The same flushing flows that were delivered to the upper Beaverhead were routed down Poindexter Slough and have prevented sand and silt from filling in constructed pools and riffles.

**So, what do the fish think?**

The upper Beaverhead was a bright spot last year and had near to above average abundances in brown trout.
while also meeting our size goals of having about 20% of fish being over 18”. Poindexter Slough boasted seven times the average proportion of fish over 18” – a historic high – while still providing good overall abundances. Anglers in both streams also reported better hatches of aquatic invertebrates that are dependent on the same types of habitats. Perhaps more noteworthy, adjacent reaches and streams with similar relative flow regimes but less intensive habitat work did not fare as well. We’ll assess the effects of this past year’s severe drought on these wild trout populations next spring but focus on wild trout habitat put them in a relatively good position to be more resilient to extremely low flows.

Drought conditions may create better near-term fishing in Clark Canyon and Ruby reservoirs. These reservoir trout fisheries are stocked to be near carrying capacity in average conditions. When extreme drought significantly reduces reservoir stor-
Wild trout management has been the cornerstone of fisheries management in Montana’s rivers and streams since 1974, when hatchery supplementation of those waters was halted. For the better part of 50 years, the fisheries have been self-sustaining and continue to provide world class fishing opportunities. However, conditions such as warming temperatures and augmented flow regimes due to climate change pose new challenges to wild trout management. FWP Region 3 fisheries personnel are working to develop strategies that will enhance and conserve the wild trout fishery of the Madison River.

First things first, set a goal! During the winter of 2020, fisheries biologists sat down and hammered out management and “trophy” goals for each of the long-term Madison River monitoring reaches. These goals were set with the opinion that active management actions could be implemented to consistently achieve an above average trout fishery. Combined abundances of rainbow and brown trout ≥ 254 mm were set at 2,200 fish/mile, 1,100 fish/mile, and 2,500 fish/mile at Pine Butte, Varney, and Norris, respectively. Anglers like big fish and the Madison can grow them! “Trophy” goals were set as a percentage of combined rainbow and brown trout abundances comprised of fish ≥406 mm (16” or greater) and are 25% for Pine Butte, 35% for Varney, and 15% for Norris.

Now what? How do we reach the goal? Fisheries personnel are taking significant first steps towards understanding factors influencing trout abundance and exploring areas for enhancement. A review of all previously completed studies and collected fisheries data is currently underway. The review will describe what is known about the movements, habitat use, and ecology of the Madison River trout population. It is apparent that a substantial amount of fieldwork has been centered on trout abundance estimates and little attention has been given to trout habitat use or tributary contribution the Madison fishery.

FWP is evaluating tributary contribution to the Madison fishery through otolith microchemistry. The natal origin of a fish can be
Otoliths taken from Madison River fish 2021.

One of the many piles of data and Madison River reports to be summarized.

determined through elemental and isotopic analysis of the ear bone (i.e., otolith). During development, the elements and isotopes present in the water accumulate on the otolith. These elemental or isotopic signatures remain unchanged and allow biologists to trace fish back to their natal waters, provided enough variation in the water chemistry exists between waters of interest. Finally, we are investigating if the density of boulders, side channels, and islands influence trout abundances, through mixed effects modeling. These current endeavors are first steps towards the development and implementation of management actions intended to improve and sustain the “world famous” Madison River wild trout fishery.

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The Smith River drainage in central Montana typifies the tale of the westslope cutthroat trout east of the Continental Divide. Once supporting an estimated 741 miles of habitat, today only 17.5 stream miles (2%) support nonhybridized westslope cutthroat trout. Westslope cutthroat trout populations have substantially declined from loss of habitat, competition and predation from non-native fish species, and hybridization. Only four aboriginal lineages of nonhybridized Smith River westslope cutthroat trout remain. This is the story of one of those populations, how it was lost, and eventually rediscovered.

Richardson Creek is a small headwater tributary of the North Fork Smith River in the Castle Mountains. In the late 1990s a small nonhybridized westslope cutthroat trout population was discovered in the creek’s headwaters above a high gradient cascade that appeared to restrict the upstream movement of non-native trout. Meanwhile, additional fisheries and habitat surveys in nearby Fourmile Creek found the upper 3 miles of this stream was fishless above a series of bedrock barriers. A plan was made to transfer some of the Richardson fish to the vacant habitat in Fourmile and in the summer of 2000, 50 westslope cutthroat trout from Richardson were packed into upper Fourmile and released in the fishless portion of stream.

Post-transfer monitoring in Fourmile Creek in the years following failed to detect the transplanted cutthroat had established. It was thought that the transfer was a failure. Worse, in 2013 genetic monitoring of the original Richardson Creek population revealed a recent hybridization event. Non-natives had scaled the high gradient cascade and interbred with the native westslope cutthroat trout. It was not until the summer of 2020 that the upper reach of Fourmile Creek was surveyed again to evaluate habitat for future fish transfers. However, a robust population of westslope cutthroat was found in a small reach of the originally fishless stream! Genetic samples were collected, and it was confirmed that these were nonhybridized westslope cutthroat trout. It appears that the Richardson Creek strain is alive and well thanks to the wild fish transfer from 20 years ago.

This story illustrates the important role wild fish transfers play in preserving Montana’s westslope cutthroat trout. Although this transferred population only occupies 0.75 stream miles, it represents one quarter of the remaining aboriginal nonhybridized Smith River westslope cutthroat trout. Plans to expand the population in Fourmile Creek are underway and additional fishless habitat has been located nearby for future transfers.
Holter Yellow Perch Are Back!
Adam Strainer, Fisheries Biologist

Holter Reservoir has historically had exceptional fishing opportunities for rainbow and brown trout, walleye and yellow perch. That last species, the wild, self-sustaining yellow perch population, is what has driven anglers for decades, especially in the winter, from across the state to Holter. When a healthy, robust population of perch is present, anglers flock to Holter to relive “the glory days” of 5-gallon buckets of 8 to 12-inch perch. Long-term monitoring of the population by FWP has been essential for adjusting fishing regulation during lean years and preparing anglers for when banner numbers are on the horizon.

Between 1996 and 2012, yellow perch were, well, in a bit of slump. And, angler trends, or the number of people fishing the reservoir, declined over the same period. From 1986 to 1997, when the yellow perch population was initially booming, Holter was as high as the #2 destination fishery in the state and averaged over 70,000 angler days. By the late 2000s, after nearly 20 years of low yellow perch numbers, angler day numbers fell to under 40,000. Then, in 2013, FWP surveys identified a once-in-a-lifetime age class of yellow perch. Queue Bruce Springsteen’s “Glory Days”.

Yellow perch fishing on Holter from 2013 to 2018 was excellent and FWP adjusted the regulation to reflect a robust population. And the anglers came. Angler numbers on Holter eclipsed 95,000 in 2017, a new all-time high, and 5-gallon buckets of 8 to 12-inch yellow perch were common. However, that banner age-class got older and abundance levels, monitored annually by FWP, declined. In turn, FWP reduced the regulation to match the ever-fluctuating wild yellow perch population in Holter. Angler numbers again dipped and FWP anticipated a few lean yellow perch fishing years but held out hope that a good spawn was on the horizon. That hope was realized the fall of 2021. FWP survey results showed that a strong yellow perch spawn in 2020 have them on track to reach their 2nd highest population level on record. This latest banner yellow perch age-class is 5 to 7-inches and will likely be at angler preferred sizes (8 to 12-inches) by the winter of 2022-23. What does this mean? Holter Yellow perch are back!
Canyon Ferry Reservoir – Destination Walleye Fishery
Troy Humphrey, Fisheries Technician

Canyon Ferry Reservoir continues to be one of the most popular angling destinations in Montana with wild walleye and yellow perch management one of the priorities of the reservoir.

Walleye anglers have excellent fishing opportunities in Canyon Ferry during open-water months with high catch rates. However, due to declining walleye numbers and less than preferred size in recent years, FWP implemented a new regulation in 2020 of 10 daily, only 1 over 15 inches, possession limit is twice the daily limit. The new limit reduced the daily and possession limits by half and addressed angler concerns of catching very few walleye over 15 inches. An immediate response was realized during the fall 2021 survey as both walleye numbers and size improved.

Trophy sized yellow perch (10-inches or greater) continue to be the primary draw for yellow perch anglers on Canyon Ferry, especially during the winter months. FWP continues to take a conservative population management approach for yellow perch by limiting angler harvest to protect a portion of spawning sized fish that would normally be harvested through more liberal regulations (limit is 10 daily and in possession). Anglers continue to catch yellow perch while trolling for walleye during open-water months, but the most effecting angling continues to be during the winter.

In 2021 FWP, in cooperation with the City of Helena, Broadwater County Sanitation, and Department of Natural Resources & Conservation helicopter pilots placed spawning habitat made from upcycled Christmas trees (Pines for Perch) into the south end of the reservoir. Volunteers from the Helena Boy Scout Troop 214, Upper Missouri River and Gallatin/Madison chapters of Walleyes Unlimited provided a considerable amount of assistance, both in labor and in financial contributions. This project has taken place nearly every spring since the mid-1990s and may be largely responsible for stabilizing numbers of yellow perch in the reservoir in recent years.
Those Wild Little Fish That Make the Reservoir Magic Happen

Katie Vivian, Fisheries Biologist

Many of the eastern Rocky Mountain Front’s popular fisheries lie within constructed reservoir systems intended for irrigation of the adjacent agriculture land. Designed to store and release large amounts of water, reservoirs are regularly built like bathtubs with limited shoreline and spawning habitat for game fish. With fluctuating elevations and lack of spawning habitat, these fisheries are often dependent on annual hatchery stocking events. For Willow Creek Reservoir, Nilan Reservoir, Pishkun Reservoir, Bynum Reservoir, and others, FWP hatchery stockings are critical to maintaining or establishing game fish opportunities. However, the success of these hatchery fish are driven by the wild forage fish species within these ecosystems.

As many game fish species grow, they transition to a piscivorous (fish eating) life stage. Commonly referred to as “minnows”, small wild fish species such as brook sticklebacks, spottail shiners, emerald shiners, fathead minnows, white suckers, and yellow perch are important prey items for our rainbow trout, brown trout, northern pike and walleye.

Yellow perch are unique among this list as not only a vital forage fish but also a popular game fish. The Tiber Christmas Tree habitat project began in 1990 to boost spawning and recruitment of yellow perch in an otherwise habitat limited system. In 2021, trees were again collected with the help of Walleyes Unlimited and the Great Falls Parks and Recreation Department and placed throughout Tiber Reservoir.

Reservoir fishery management is a balancing act. For some systems, the goal is to stock fish to establish or boost a self-sustaining, wild population. This was the 2021 introduction of largemouth bass into Lake Shelby and the 2020 addition of walleye into Lake Frances. Elsewhere, our goal is to stock to higher densities for catch and keep opportunities without exceeding the “carrying capacity” or support system of an ecosystem. This management strategy is seen in the 2021 addition of 100,000 juvenile rainbow trout to Willow Creek Reservoir and the 45,000 Gerrard rainbow trout stocked in Tiber Reservoir.

Whereas many reservoir fisheries originate in hatcheries, wild fish are critical to the ecosystem balance and success of these systems. These small fish that dart among the submerged vegetation and school along the shorelines are easily overlooked. However, they are the key to well-fed predators and the opportunity to land a lunker is what makes the long drives and windy days completely worth it.
Judith River PIT Monitoring
Rob Beattie, Fisheries Technician

FWP continued monitoring native and non-native species use of the lower Judith River in 2021. Beginning this year, efforts were made to capture and implant passive integrated transponder (PIT) tags into some fish captured in the lower Judith River and confluence of the Missouri River. Stationary PIT reader arrays were installed at Judith River mile 0.1 and Judith River mile 2.8. The arrays span the entire channel width and read a unique identification number from tagged individuals as they pass over the array.

Hoop nets and electrofishing were used to capture target species in spring and early summer. PIT tags were implanted into 10 species and 183 individuals in the lower Judith and confluence area. The two lower Judith stationary PIT arrays detected 10 species and 93 unique individuals in 2021. Initial results suggest that tag retention is high across species and detection rates are good despite trouble with shifting substrate and beavers. Highlights include the first ever documentation of pallid sturgeon and bigmouth buffalo utilizing the Judith River. In addition, multiple blue sucker spawning aggregations were found. One of the most interesting movements documented in 2021 was a burbot tagged at Judith River mile 4.9 in March that was later documented in May at stationary PIT arrays in the Marias and Teton rivers.

PIT tag technology efforts on the lower Judith augments similar work done on the Marias and Teton rivers, providing a comprehensive picture of the Missouri River and its major tributaries between Morony Dam and Fort Peck Reservoir. FWP crews working on the mainstem Missouri, Marias and Teton have tagged over 4,000 individuals from a variety of species. Future PIT efforts on the Judith River include installing new stationary PIT arrays in 2022 at river mile 20 and river mile 45. Crews will continue to tag individuals captured in the lower Judith, Marias, Teton, and Missouri rivers.

Lewistown Management Area
Clint Smith, Fisheries Biologist

Lewistown Area Habitat Projects

We have been working on multiple habitat projects in the Lewistown area in 2021. On Big Spring Creek, FWP partnered with a local landowner to address stream migration concerns occurring on property that neighbors the Carroll Trail FAS. FWP works hard to be a good neighbor and we were able to coordinate with our FAS staff and the landowner to address his concerns while improving the streambank and riparian habitat. This section of creek had migrated roughly 70 feet in recent years causing the landowner to lose valuable hay ground and required multiple fence repairs. By working collaboratively with the landowner, we identified the goal of slowing the stream migration, creating a riparian buffer, and improving the habitat in and along Big Spring Creek. In the spring of 2021, FWP worked with Miller Recreational Development to apply an alluvial-brush matrix treatment to roughly 300 feet of eroding streambank on Big Spring Creek. The alluvial-brush matrix used locally collected alluvium (gravel and cobbles) and wood (rooted shrubs, willows, and other brush) to create a semi-deformable bankline. The approach also incorporates a flood-prone bench behind the new streambank which traps nutrient-rich sediment in high flows and will fill in with vegetation as the rooted shrubs and deposited seeds establish. The completed project has created loads of habitat complexity such as flow velocity breaks that are great trout nursery habitat, wood in and next to the channel.
that encourages invertebrate productivity, and a riparian buffer area that will benefit many terrestrial and aquatic species. The project has been a success and we are excited to watch the vegetation develop in the coming years.

In a different vein, we have also been working on a few habitat projects to improve access and angler success at Big Casino Creek Reservoir near Lewistown. Wave action has been eroding the east shore of the reservoir extensively in recent years, making angling access difficult in addition to creating an area of high turbidity and shallow, silt dominated substrates. Also, due to the lack of habitat complexity around the reservoir, cover habitat is limited to deep water which most shore-based anglers can’t access. In an effort to address these issues, FWP partnered with local sporting groups to raise funds and implement habitat improvements at the reservoir. FWP built numerous artificial habitat structures, called porcupine balls and Georgia cubes, which we have placed in near-shore habitats around the reservoir. Our goal is that the artificial structures will attract game fish such as largemouth bass, black crappie, and yellow perch to areas of the reservoir where they may be more susceptible to anglers. In addition to a future seasonal fishing dock, we are planning to install a shoreline treatment of stone-framed deflectors that will recontour the existing eroding bank and provide convenient locations for anglers to fish from. The access improvements should be completed by summer 2022.

Martinsdale Reservoir

Martinsdale Reservoir traditionally has a quality rainbow trout fishery, with fish routinely in very good condition. White suckers generally dominate the biomass present in the reservoir and we consistently catch 8-10 suckers to every trout. In recent years, we’ve stocked brown trout in the reservoir and have seen good results. Brown Trout are generally more piscivorous than rainbows and, given the abundant forage in Martinsdale (suckers, crayfish, and stocked rainbows), they are growing like gangbusters in the reservoir. In the past two years of netting, we have collected 48
browns, which ranged from 16 to 30 inches and averaged 21 inches. The average weight of sampled brown trout was 3.5 pounds and numerous fish over 5 pounds have been observed. In the past two years of sampling, 63% of the brown trout collected have been larger than 20 inches.

**Ackley Lake**

Catch rates of rainbow trout in Ackley Lake have increased drastically in recent years. We went from an all-time low in 2018 of six trout per net-night in 2018 to more than 40 fish per net-night in 2021. The downside of this is that our catch rates of white suckers have more than tripled since 2018 and rainbow trout average size is down about 40%. These are signs that the predatory pressure of tiger muskie on the fishery is relaxing. Given the changing fishery dynamics in Ackley, the tiger muskie regulation was returned to the Central District standard in 2022 (1 daily and in possession, must be over 40 inches). Additional stocking of tiger muskie will be carefully considered as the existing biological control of the fishery ages out.

**Middle Fork Judith River**

Collaborative efforts to restore the Middle Fork Judith River continued in 2021. Our goal is to address the chronic degradation of the stream caused by sedimentation associated with numerous trail crossings. Montana Trout Unlimited, Helena-Lewis and Clark National Forest, and Montana Department of Environmental Quality have worked extensively on estimating sediment loads from the numerous motorized trail crossings, applied for the necessary funding, and implemented multiple phases of the trail reroute which will move the trail out of the river bottom and restore most of the crossings to mitigate the severe sedimentation that occurs in the Middle Fork.

In 2021, FWP replicated longitudinal sampling of the Middle Fork Judith that was done in 2015. In 2015, we found abysmally low trout abundances throughout the Middle Fork, with numbers improving slightly further up drainage as the accumulated sediment impacts from the trail crossings decrease. The 2021 sampling showed very little change from the 2015 data and the same general trends were observed. This pre-restoration monitoring will prove valuable as this collaborative effort continues to pursue the trail reroute with the goal of restoring the integrity of the watershed and its resources. To date, the trail reroute project is ahead of schedule and under budget and we are hopeful that stream restoration work can begin in the summer of 2022.

![FWP crews sampling the Middle Fork Judith River](image)

*FWP crews sampling the Middle Fork Judith River as part of the collaborative effort to repair and restore the chronically degraded river.*
FISHING NEWSLETTER
2022

Marias River PIT Array Update 2021
Jake Williams, Fisheries Technician

FWP began to investigate the use of passive integrated transponder (PIT) technology for monitoring spawning movements of native species into the Marias River in 2016. PIT tags have been widely used in fisheries management over the last two decades. These extremely small tags emit a unique number that can be detected at close range by a PIT reader. This is the same technology used if you “microchip” a pet. PIT tags are extremely versatile and can be implanted into a wide range of fish species and fish as small as four inches.

Crews began tagging fish captured around the Marias River confluence with the Missouri River in 2016. Tags are implanted into the body cavity of each individual fish to prevent tag. Tagging efforts have increased throughout the last few years and have focused on shovelnose sturgeon and endangered pallid sturgeon. At the end of the 2021, 4,348 individual fish have been tagged, including 2,338 shovelnose sturgeon and 334 pallid sturgeon.

The first large stationary PIT reader array was installed in the Marias River just below the Teton River confluence in 2017. FWP added three arrays in 2021 and is currently operating and maintaining seven stationary arrays; six on the Marias River and two on the Teton River. These stationary arrays consist of large wire anchored to the bottom that extend the entire width of the river. The wire is connected to a solar powered PIT reader on the bank that is constantly monitoring for passing tagged fish.

These stationary arrays have been extremely effective at detecting fish moving into and out of the Marias and Teton rivers. By the end of October 2021, 523 individual fish were detected at PIT readers, including 410 shovelnose and one pallid sturgeon. Lower river flows altered fish movement in 2021, with a 40% decline of individual fish migrating into the Marias and Teton rivers compared to 2020. Water release from Tiber dam stayed between 500 and
Numerous anglers take to the Missouri River every year in search of wild rainbow trout and brown trout. These populations are sustained by natural reproduction with roughly 30 to 40% of the production attributed to the mainstem Missouri River and the remaining from several major spawning tributaries, as measured by past redd count surveys.

Surveys in the Craig section of the Missouri River in 2021 estimated 6,661 rainbow trout and 365 brown trout 10 inches and greater per mile. The rainbow trout estimate was well above the long-term average of 3,469 and was the second highest on record since sampling began in 1982. Large numbers of small rainbow trout were observed in the Craig section in fall 2020 and these fish were evident in 2021 with more medium-sized fish present than in recent years. One-year old brown trout were also abundant during sampling in spring 2021 that would have been the product of spawning in fall 2019. The high flow in 2018 may have contributed to the large year-classes observed by flushing fine substrates from spawning gravels and improving spawning conditions. However, other factors are also likely important as large year classes of fish were not observed each year following 2018.

Rainbow trout were estimated at 1,621 per mile 10 inches and greater in 2021 in the Cascade section compared to the long-term average of 1,591, while brown trout were estimated at 339 per mile compared to the long-term average of 386 per mile. Juvenile trout were also abundant in the Cascade section but not to the degree seen in the Craig section.

Statewide angler use surveys are conducted very other year to monitor angler use across the state. The section of the Missouri River from Holter Dam to Cascade consistently ranks as the top one or two fisheries in the state in terms of most angler use. Estimated angler use was slightly lower in 2019 with 154,628 angler days compared to the peak on the Missouri in 2015 at 183,479 angler days. Regardless, angler use surveys indicate consistently high use over the last decade compared to earlier years.

The effect of drought was a common theme in 2021 and despite the Missouri River being a tailwater that is controlled by flows coming out of Canyon Ferry Dam, low flows and high-water temperatures were also a concern for the Missouri River below Holter Dam. There was no increased spring flow on the Missouri River and flows gradually decreased from the preferred minimum of 4,100 cfs to near 3,000 cfs by the end of June.
Water temperatures were monitored throughout the Missouri River and daily water temperatures at Craig frequently exceeded 70°F throughout the month of July and approached 72°F on several occasions. Higher water temperatures were observed downstream near Cascade. Although water temperatures did not meet the typical criteria of 73°F for three consecutive days and flows were not quite below the 5th percentile, the department implemented Hoot Owl angling restrictions on the Missouri River from July 20 to August 17. The restrictions were implemented to reduce the stress on this wild fishery, given the low flows, high water temperatures, high angling pressure, stress associated with catch and release angling, and the shift in angling pressure to the Missouri River as angling restrictions were implemented on other waters throughout the state. Angling restrictions were last implemented on the Missouri River below Holter in 2000. Flows were lower and water temperatures were higher earlier in the year in 2021 than in 2000.

Northern pike observations continue to be reported by anglers from throughout the Missouri River from Great Falls to Holter Dam. Reports first began in 2018 and have increased in abundance in recent years, particularly in spring as the northern pike move throughout the system. Northern pike have become more abundant in the reservoirs upstream, and it is expected they have gradually moved downstream from the reservoirs. However, several young of the year have been sampled suggesting at least some natural reproduction is occurring downstream of Holter Dam. In 2019, the Fish and Wildlife Commission approved changes to the northern pike regulations downstream of Holter Dam that went into effect March 1, 2020. Northern pike regulations on the Missouri River from Holter Dam downstream to Black Eagle Dam changed from the standard regulation of 10 daily and in possession to No Limit. This regulation change is intended to encourage harvest given the increased abundance of this aggressive predator throughout the system and is consistent with regulations already in place in the Missouri River and reservoirs upstream of Holter Dam.
Smith River

Low flows were a major concern in the Smith River in 2021 after having three consecutive years of relatively good flows. Record low flows were recorded at the USGS gage below Eagle Creek with flows dropping below 100 cfs on June 24th, which is the earliest on record. Flows were less 50 cfs by July 21st and didn’t exceed 80 cfs until October 8th. The early low flows combined with hot and dry weather, resulted in warm water temperatures, in excess of 73F by mid- to late June, which is earlier than most years. To minimize stress on the wild trout fishery the department implemented Hoot Owl angling restrictions on the Smith River due to the low flows and high-water temperatures from June 28th to August 25th. Hoot owl angling restrictions were last implemented on the Smith River in 2017.

Despite the angling restrictions, a small fish kill was observed over a short section of the Smith River in the Fort Logan area. The cause of the fish kill is unknown, but it is likely that low flows and high-water temperatures contributed to increased stress. Fisheries crews counted the following mortalities: 1 brown trout, 1 rainbow trout, 37 sculpin, 6 longnose dace, 22 mountain whitefish, and 86 crayfish.

Given the especially poor conditions for trout in the Smith River in 2021, and that flows did not recover substantially until mid-October, population sampling was not conducted in 2021. In 2020, the total trout population estimate was near average with 633 trout per mile 8 inches long and greater compared to the long-term median of 662 per mile at the monitoring site downstream of Camp Baker. By species, we estimated 411 rainbow trout per mile and 222 brown trout per mile, both of which are similar to the long-term medians. Future monitoring will be important to evaluate potential impacts to this wild trout fishery from record low flows and high water temperatures in 2021.

Lake Sutherlin (Smith River Reservoir) and Newlan Creek Reservoir

Lake Sutherlin and Newlan Creek Reservoir provide quality angling for stocked rainbow trout, as well as the potential to catch large burbot (otherwise known as ling), which reproduce naturally in both reservoirs and are a sustainable wild fishery. Rainbow trout are maintained by stocking in both reservoirs and kokanee salmon have also been stocked annually since 2014 to provide another opportunity for anglers. Westslope cutthroat trout are also periodically stocked in Newlan Creek Reservoir and were stocked in 2020.

Sampling with trap nets in fall 2020 and 2021 indicated healthy populations of burbot in both reservoirs with numerous large individuals up to 35 inches and 13.5 pounds. Sampling corresponded with near the time of kokanee spawning and numerous individuals were sampled from both reservoirs with an average size of 13.3 inches in Newlan Creek Reservoir and 18 inches in Lake Sutherlin. Sampling results are consistent with angler reports of catching more kokanee in Newlan Creek Reservoir and larger individuals in Lake Sutherlin. Because kokanee spawning success is limited and mortality after spawning is high, snaggling for kokanee is allowed in the inlet areas of both reservoirs in the fall and has become another popular component of the fishery.
A creel survey was completed on both reservoirs in 2021. Data are being compiled and results are still to come. As part of the survey burbot were tagged with plastic Floy tags to learn about their catch rates, harvest rates, growth rates, age, and other population measurements. If you catch a tagged burbot from Lake Sutherlin and Newlan Creek Reservoir please report it to the Region 4 office in Great Falls. This information will help manage the wild burbot fishery in these reservoirs and ensure the quality of the fishery.

**Great Falls Area Ponds**

Adam Geik, Fisheries Technician

**Great Falls Area Private Pond Program**

The department has agreements with many landowners throughout the area to stock fish in private ponds if the landowners allow public access to fish. Recent activities in the program include the addition of new ponds, wild black crappie transfers to establish new crappie fisheries, and ongoing stocking of rainbow trout and largemouth bass. Staff is currently updating the Region 4 pond guide which will include access information, stocking records, and sampling reports. The guide will be available on the department’s website and at the Region 4 FWP office in Great Falls. Sampling, stocking, and fish transfer data can also be found on the FWP website under the FishMT tab.

**Pelican Point Pond**

This easy-to-access pond continues to produce good numbers of black crappie, largemouth bass, and yellow perch. Trap net and gill net sampling in the spring of 2021 found nice sized black crappie in the 9-11” range. The black crappie population appears to be self-sustaining again after illegally introduced northern pike were removed. Smaller largemouth bass were captured in trap nets and gill nets, but anglers have reported fish up to 5 pounds. Plentiful yellow perch up to 10” continue to provide opportunities for anglers of all ages. Northern pike were illegally introduced around ten years ago. Ongoing monitoring for them continued in 2021 and no pike were detected for the fifth consecutive year.

**Largent Bend Ponds**

Pond #2 provides easy access and has become a popular fishery for young anglers and families seeking wild populations of bluegill and stocked largemouth bass. Pond #3 provides good opportunities to catch yellow perch, black bullhead, and pumpkinseed. Largemouth bass were stocked in 2016, but they have not become well established to this point.

In 2013, a small number of tiger muskie were stocked in Pond #3. Tiger muskie, are a sterile hybrid of northern pike and muskie, and were stocked as a management tool to reduce the number of suckers in the pond. The stocking also provides anglers an opportunity to catch a large and aggressive predatory fish. Both Pond #3 and Pond #2 were flooded by high flows on the Sun River in 2018. Additional tiger muskies were stocked into Pond #3 in 2019; however, no tiger muskie have been reported since the flooding event.

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Wadsworth Pond
Jason Mullen, Fisheries Biologist

Improved management of Wadsworth Pond water levels by the West Great Falls Flood District and the City of Great Falls has resulted in improved water quantity and quality, allowing fish populations to rebound. Wadsworth Pond water levels are maintained by a pipe connecting the Sun River and Wadsworth Pond. No water was added to the pond from the Sun River from at least 2016 until spring 2020 because sediment accumulation clogged the pipe and prevented water from being added to the pond, resulting in drastically low water levels and poor water quality. The sediment in the pipe was removed, and the pond was filled in 2020. The West Great Falls Flood District and the City of Great Falls have plans to upgrade the infrastructure and to better maintain water levels in the pond, as demonstrated since spring 2020.

With the good water levels and resulting improved water quality and habitat the fishery has responded. Stocked walleye from several years classes were sampled in 2020 and 2021 including several fish over eight pounds. Walleye catch rates averaged 4.3 per sinking gill net in 2020 and 2021 combined, rivaling the catch rates seen in some of the popular walleye reservoirs in the area. The department transferred about 900 yellow perch into Wadsworth Pond before spawning in spring 2021 to help re-establish a wild population expected to reproduce naturally with the improved habitat. Fall sampling showed that numerous yellow perch survived the transfer based on a substantial increase compared to 2020. Yellow perch lengths were 6 to 11 inches and anglers have already reported improved success. A substantial increase in pumpkinseed were also observed in 2021. Pumpkinseed sunfish reproduce naturally in the pond and provide a forage base for predators and opportunities for young anglers. With improved water levels in the pond and the commitment to maintain water levels, the department has plans to stock largemouth bass beginning in 2022 to provide additional angler opportunities. With the improved water levels, the Wadsworth Pond fishery is the best it has been in years, and we encourage local anglers to get out and enjoy this urban fishery.

Large walleye during sampling.

Left: High water level. Right: Low water level.
Middle Missouri River
Luke Holmquist, Fisheries Biologist

Pallid Sturgeon Reproductive Ecology Research - Morony Dam to Fort Peck Reservoir

The Missouri River between Morony Dam and Fort Peck Reservoir provides habitat for the furthest upstream population of endangered pallid sturgeon in the Missouri River watershed. Like downstream populations, little to no natural recruitment has been observed in the last 60-plus years. Recovery efforts have included a very successful stocking program that began in the late 1990s. The high survival rate of these hatchery origin fish has greatly reduced the threat of extinction for the near future. However, much work remains for recovering this amazing species. Natural reproduction has never been documented in the Middle Missouri River, and additional research and monitoring are needed to inform management actions that could result in successful recruitment.

The “smoking gun” responsible for the lack of recruitment by pallid sturgeon in the past six or seven decades is a combination of at the pallid sturgeon’s early life-history and the large dams that have been constructed on the Missouri River and its major tributaries. When a pallid sturgeon spawns the fertilized eggs adhere to the bottom of the river, at or near the spawning site, and after hatching larvae will freely drift downstream for an extended period while absorbing the nutrients in their yolk sac. After their yolk sac is absorbed, they “settle out” on the bottom of the river and begin feeding on their own. This drift period can last between 9 and 17 days and is estimated to cover distances between 150 and 330 miles. When these larvae drift into the upper ends of reservoirs they encounter a zone with very slow-moving water that has very little dissolved oxygen and the larvae essentially suffocate. In instances where spawning does not occur far enough upstream all the larvae perish, and no recruitment occurs.

Past research efforts have been hindered by the small sample size of wild produced pallid sturgeon that remain in this stretch. Pallid sturgeon do not reach sexual maturity until 15-20 years of age, so it wasn’t until recently that some of the hatchery origin fish have become capable of reproducing. As more and more of these fish reach maturity, FWP and our partners are provided with a better opportunity to pinpoint the environmental and biological conditions that are conducive to successful spawning and natural recruitment.

One tool we use to monitor pallid sturgeon reproductive ecology is radio telemetry. We currently have radio transmitters implanted in two wild pallid sturgeon and seventy hatchery-origin pallid sturgeon. In the early spring crews attempt to recapture previously radio

Map showing the locations of remote data logging telemetry stations along the Missouri, Marias, and Teton rivers in 2021.
tagged pallid sturgeon to evaluate if they are going to be capable of spawning each year. These tagged fish are then tracked by a combination of boat reconnaissance and 15 remote data logging ground stations on the riverbank from Fort Peck Reservoir upstream to Morony Dam near Great Falls, including the lower Marias and Teton rivers (see map below). After the spawning season, females are recaptured and assessed to determine if they have successfully spawned. The information obtained from these efforts give insight into the links between available habitat, environmental conditions, and the behavior of the fish, which in turn improves our understanding of what is necessary to recover this prehistoric species from the brink of extinction.

For example, radio telemetry data collected during the spring of 2018 showed that mature pallid sturgeon migrated from Fred Robinson Bridge and ascended the Marias River, a distance of roughly 160 miles, during a period of elevated discharge in the Missouri and Marias rivers. In previous years spawning activity by the pallid sturgeon was limited to the lower part of the river immediately upstream of Fort Peck Reservoir, where there is not enough drift distance for the drifting larvae to survive. However, if spawning were to occur in the Marias River the distance available for larval drift would exceed 180 miles, potentially allowing for recruitment to occur. This information has led to FWP working collaboratively with the U.S. Bureau of Reclamation (the agency that manages outflows at Tiber Dam) to adjust the timing and magnitude of releases of water from Tiber Dam in a way that mimics the natural flow regime and the hydrograph in 2018 that attracted pallid sturgeon. Unfortunately, relatively low snowpack and drought conditions did not allow for any flow manipulations in 2021. From a scientific inquiry standpoint this is not all bad. A low flow year, coupled with the highest number (8) of radio tagged reproductive female pallid sturgeon we have ever been able to monitor, can give researchers insight into how spawning pallid sturgeon might respond to drought conditions in the future and if recruitment is possible under those scenarios.

In 2021, FWP monitored reproductive movements and spawning success of eight mature female hatchery-origin pallid sturgeon in response to environmental and biological conditions. Despite having initial relocations spread out from Fort Peck to Judith Landing (over 100 river miles), eight ripe female pallid sturgeon all converged on a ten-mile reach centered around Fred Robinson Bridge between June 10th and 15th, presumably to spawn. Spawning aggregations of males began to congregate in this reach starting the last week of May and later dispersed in mid-June. As we have seen in past years and in other populations of pallid sturgeon, the males often show up to a spawning site several weeks prior to females and it is very common for females to swim past these aggregations multiple times before ultimately spawning, almost as if they are searching for the optimal mate and spawning conditions. Because of this “searching” behavior, FWP biologists will watch for changes in behavior of individual female pallid sturgeon which might indicate they have successfully spawned while mingling with the males at these aggregation sites while conditions are suitable for spawning. A female is suspected to have spawned based on changes in behavior, often a change from rapid movements to a sedentary position or slow but deliberate movement upstream or downstream. Crews will attempt to recapture that individual to perform a post-spawn reproductive assessment. These assessments involve collecting a blood sample, gonad sample, and a weight to compare with the weight recorded earlier in the spring when the female was full of eggs.

Post-spawn reproductive assessments were challenging in 2021 due to elevated water temperatures. When water temperatures are hot (> 75°F) crews halt any pallid sturgeon recapture efforts to reduce additional stress to the fish. When water temperatures cooled off, our team recaptured any at-large females as quickly as possible. Despite delayed recapture efforts, we were ultimately able to recapture seven of the eight females and determined that three spawned and the other four underwent follicular atresia. Atresia is the mechanism by which sturgeon, and other fishes, can reabsorb the nutrients from their ovary (sometimes up to 22% of their body weight) rather than spawning. Atresia is a useful strategy for a fish when spawning conditions are not ideal, such as in 2021. The fish that spawned likely did so between June 10th and 22nd in the reach near Fred Robinson Bridge during the time when conditions were suitable for spawning. Spawning at this location is not expected to result in successful recruitment due to its close proximity to Fort Peck Reservoir. The four fish that reabsorbed their eggs didn’t spawn during that window, despite being present at the aggregations, after which daily maximum water temperatures exceeded the upper thermal limits for Pallid Sturgeon spawning until the second week of August.
The final female was never recaptured, but may have made the most interesting migration of the bunch. After being assessed 10 miles downstream of Fred Robinson Bridge on April 29th she migrated upstream and entered the Marias River on June 3rd, remained in the lower mile for eight hours, before rapidly migrating downstream, reaching Fred Robinson Bridge and the male aggregation on June 9th and moving back upstream starting on June 14th. Over the course of the spring and summer she swam over 350 miles. Based on her movement, we believe she spawned near Fred Robinson Bridge in the middle of June before slowly moving upstream, but we will likely never know for sure. This fish is interesting to researchers because she migrated up the Missouri River to the Marias River confluence without needing the Missouri River peak discharge to exceed 15,000 cfs and even entered the Marias River. At that time the Marias River discharge was at 590 cfs, the Teton River was at 297 cfs and the water temperature in the Marias River was just shy of 80°F. These are not ideal conditions for pallid sturgeon spawning which is likely why she left and went back downstream to spawn. However, it is useful information for us to know that the Missouri River discharge doesn’t necessarily need to be high in order to influence upstream migration by mature pallid sturgeon during the spring rise. Additionally, this information demonstrates that, without a natural flow regime and optimal spawning temperatures in the Marias River, fish will not ascend the river to spawn.

Another tool that we utilize for researching pallid sturgeon reproductive ecology is larval sampling. Larval sampling entails an anchored boat with fine mesh nets suspended in the current to capture the drifting sturgeon larvae as they move downstream. Sampling for these larvae is done to document successful fertilization and hatch and sampling locations are often selected based on recent telemetry data. FWP crews sampled for drifting larvae, which are called “free embryos”, downstream of suspected spawning locations and male aggregations. Crews sampled 345 drifting Acipenseriform larvae (the scientific order that includes all sturgeon and paddlefish) and 138 unhatched eggs downstream of Fred Robinson Bridge. Genetic testing is used to determine which, if any, of the 345 free embryos and 138 unhatched eggs are pallid sturgeon, as most larvae sampled will be shovelnose sturgeon or paddlefish. Genetic confirmation of a pallid sturgeon free embryo or egg is always exciting news. The size of the free embryo, where it was sampled, and who its parents are can tell us important information about spawning locations and validate some of our telemetry data if the mother or father is one of our telemetered fish. This was the case in 2019, when we sampled four free embryos that were progeny from 1997-year-class pallid sturgeon that we suspected to have spawned below Fred Robinson Bridge based on telemetry data. Those larvae were monumental because they provided the final piece of evidence for us to determine that the hatchery-origin fish were successfully spawning in this reach of river. This was an important step towards recovery in the Middle Missouri River because the hatchery fish are the future of this population until natural recruitment is restored. The genetic results are still pending from the 2021 field season.
REGION 5
SOUTH CENTRAL MONTANA

The West Rosebud Drainage

Bryan Giordano, Fisheries Biologist

FWP monitors fisheries in Mystic Lake and in the West Rosebud drainage below Mystic Lake Dam, a hydroelectric dam owned and operated by NorthWestern Energy. Monitoring includes gill netting in the lakes and electrofishing in West Rosebud Creek. A redd (fish nest) count is also completed every Fall.

Mystic Lake is the largest lake in the Beartooths. Accessing Mystic Lake requires a roughly 3-mile hike from the trailhead near the powerhouse below the dam. Mystic Lake was last sampled in August 2021, when we caught 192 rainbow trout ranging from 6.5-16.5 inches.

West Rosebud and Emerald Lakes are located about 3.5 miles below Mystic dam and are easily accessed from the road. Both contain wild brown trout, brook trout, mountain whitefish, and longnose suckers. Both lakes are also stocked annually with rainbow trout. In May of 2019 we sampled both lakes and captured trout ranging from 6.9-20.9 inches. Both lakes grow large brown trout with some over 20 inches most years.

Above the powerhouse, West Rosebud Creek is smaller because part of the creek is in a pipe that delivers water to the electrical turbines. Mostly small rainbow trout live here, but there are a lot of them. In 2020, electrofishing estimates indicated there were about 169 rainbow trout in a 300-foot section. That is equivalent to nearly 3,000 fish per mile. Five miles downstream, in the Pine Grove Section, the fish population is dominated by brown trout. In May of 2019, brown trout ranging from 8-19 inches were estimated at 179 fish per mile. A few brook trout, rainbow trout, and mountain whitefish were also captured.

Each Fall, brown trout from downstream in the Stillwater River and even further down in the Yellowstone River migrate up West Rosebud Creek to spawn. They dig a redd and bury their eggs in the gravel. These nests can be seen and counted while walking the stream and can indicate the relative number of spawning fish present in the system. The number of redds counted year to year has varied from as few as 6 to as many as 50. In November of 2021, a record 51 brown trout redds were counted.

A diverse and wild fishery, beautiful scenery, and relatively easy access make the West Rosebud drainage a great place to visit.
Little Blue Lines
Bryan Giordano, Fisheries Biologist

Montana is home to some of the most renowned rivers in the trout fishing world. Anglers flock to the Madison, Big Hole, Clark Fork, Bighorn, and Yellowstone rivers every year. While these larger rivers get most of the attention, the small creeks tend to go unnoticed. These small creeks provide our rivers with colder water during the summer months, spawning habitat for migratory fish, and contain their own resident wild fish populations.

FWP have recently been sampling these smaller creeks in the Beartooth Mountains to document the species and size of fish present. Angling sampling is usually the best way to sample many of these creeks due to their size and gradient, which makes it difficult and inefficient to electrofish.

Main Fork Rock Creek, Lake Fork Rock Creek, and West Fork Rock Creek were sampled in 2020, and West Fishtail Creek was sampled in 2021 using angling. All four creeks provided excellent fishing for small to medium sized trout. The three forks of Rock Creek are easily accessible with good trails or roads running alongside and provide areas with easy casting. West Fishtail Creek provides a more challenging but secluded experience, with a three-mile hike on a good Forest Service trail with difficult casting once you reach the stream.

These are just a few of the hundreds of creeks filled with wild fish in Montana waiting to be explored. Many have already been sampled by FWP and you can find that information on FishMT. However, you may discover a hidden gem you don’t want to tell even your closest fishing buddy about, but we’d like to hear about it. So, when you’re planning your next fishing trip, don’t neglect those little blue lines on the map.

<table>
<thead>
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<th>Stream</th>
<th>Species Present</th>
<th>Average Size (Inches)</th>
<th>Size Range (Inches)</th>
<th>Catch Rate (Fish/Hour)</th>
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<td>Brook Trout, Rainbow Trout</td>
<td>7.5</td>
<td>4-10</td>
<td>9</td>
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<td>Lake Fork Rock Creek</td>
<td>Brook Trout, Rainbow Trout</td>
<td>8.5</td>
<td>6-12</td>
<td>8</td>
</tr>
<tr>
<td>West Fork Rock Creek</td>
<td>Brook Trout, Rainbow Trout</td>
<td>9</td>
<td>5-13.5</td>
<td>6</td>
</tr>
<tr>
<td>West Fishtail Creek</td>
<td>Brook Trout</td>
<td>7.5</td>
<td>5-10</td>
<td>10</td>
</tr>
</tbody>
</table>

Angling statistics for FWP sampling events in 2020 and 2021.
Buffalo Creek Yellowstone Cutthroat Trout Conservation Project Update
Bryan Giordano, Fisheries Biologist

Buffalo Creek, a tributary to Slough Creek, currently presents a threat to Yellowstone cutthroat trout in the Lamar River drainage. A telemetry study completed through Montana State University identified Buffalo Creek as the primary source of non-native rainbow trout in the Lamar drainage. The Lamar River system has long been a stronghold for Yellowstone cutthroat trout and the rainbow trout in Buffalo Creek threaten their persistence through hybridization.

FWP, Yellowstone National Park, and U.S. Forest Service plan to renovate Buffalo Creek to remove non-native rainbow trout using piscicide and establish a Yellowstone cutthroat trout population. The project was approved by the Fish and Wildlife Commission in June 2021. Additionally, FWP changed fishing regulations by lifting harvest limits and adding a mandatory kill on rainbow trout in Buffalo Creek and its tributaries. These regulations now match the regulations in Yellowstone National Park for the Lamar River watershed, including Buffalo Creek.

FWP continues to work to move forward with the treatment, which is expected to begin in late summer 2022. Overall, this project would remove the biggest threat to Yellowstone cutthroat trout in the Lamar River system and establish a secure population of cutthroat trout moving forward.

Bighorn River Continues to Recover
Shannon Blackburn, Fisheries Biologist

Surveys to monitor fish populations are performed annually by FWP on four miles of the upper Bighorn River in the spring, and four miles on a lower section in the fall. Fish captured during sampling are weighed and measured, then released. Fisheries biologists use those data to estimate the number of trout-per-mile, assess population trends, and evaluate the health of the fishery. Although non-native, brown and rainbow trout in the Bighorn River are wild, meaning they have never lived in a hatchery. Wild trout live in dynamic systems, moving around to find food, avoid predators, and spawn in a constantly changing environment. As a result, wild trout are tough and adapt better than hatchery-raised fish to environmental challenges and predation. Additionally, tailwaters like the Bighorn River tend to experience cool water temperatures even during the summer and are high in nutrients which support good wild trout fisheries. But trout survival on the Bighorn River can be negatively affected when high flows are sustained for consecutive years during times when fry are extremely vulnerable. Juvenile survival was poor for both species in 2017-2019. Conversely, drought-like conditions in 2020 and 2021 produced below-average flows that also provide challenges to the fishery.

Since 2019, anglers and biologists have been concerned over low trout populations on the Bighorn River due to the variable water conditions. The num-
ber of trout in the Bighorn is up from near-record lows in 2019, but still trending below the 30-year average. The estimated number of brown trout per-mile in the upper section is similar to the 2020 estimate. However, the number of brown trout over 8” has increased. Also, we collected many juvenile brown trout (about 25% of our catch) suggesting good recruitment. Fall sampling in the lower section generated a lower estimate than 2020, but brown trout were in very good condition with an average total length of 13.6” and an average weight of 1.2 pounds.

Rainbow trout have made a dramatic comeback from the 2020 estimates. In the upper section, recruitment of rainbow trout is very good, with many fish measuring between 4–6”. There are also many large (>17”) fish remaining in the Bighorn River and the average total length was 14.0” with an average weight of 1.8 pounds. Sampling efforts detected similar trends for rainbow trout in the lower section.

Moving forward into 2022, FWP anticipates the number of wild trout in the Bighorn River will continue to increase given favorable environmental conditions this winter and next spring. Both the 2020 and 2021 water year were below average which can be conducive to young trout survival, especially rainbow trout. Additionally, the number of available spawners from 2021 (e.g., big healthy fish) is still relatively high for both species. For the 2022 fishing season, anglers may experience less trout in the 20+” range as many of these fish are probably reaching their maximum life span. However, there are many trout in both the 4–6”, range and in the 9–14” range which could increase overall catch rates next year. Even though the number of wild trout in the Bighorn River is lower than average, it is still a high-quality fishery and rivals others throughout the state.
Lake Elmo is undergoing many changes this winter. Currently, the lake is empty and will remain that way until the spring of 2022. The lake has been drained to remove an aquatic invasive species, the Asian clam. Lake Elmo State Park is the only place in the state where Asian clams have been documented and we hope to remove them before they spread elsewhere. While the lake is empty over the winter of 2021–2022, plans are in place to improve trails, fishing access and habitat, and update the headgate. Specifically, the walking trail along Lake Elmo Drive is moving away from the road and being widened. Several picnic nodes will be constructed on the northern shores. We are also building two fishing jetties (with one being ADA-compliant) that will improve angler access to deeper water. Some of the fish habitat improvements include adding spawning gravels, catfish condos, and aquatic vegetation to encourage fish spawning and rearing. Lake Elmo will likely be refilled by the end of May 2022. The fish stocking plan is currently in-development, but we plan to stock the lake with sport fish like bass, sunfish, trout, and channel catfish.

Although Lake Elmo State Park will remain open over the winter, sections of the trail may be closed at times due to construction activity. Please be respectful of signs and trail closures. And remember to always clean, drain, and dry fishing equipment and do not release pets (including aquariums) to prevent the spread of aquatic invasive species.
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 ......................................................... 406-454-8840
- Havre Area Resource Office ................................. 406-265-6177
- Lewistown Area Office ......................................... 406-538-4658
- Miles City .............................................................. 406-234-0900
- TTY (Telephone device for the deaf) ....................... 711 or 1-800-253-4091
Pallid Sturgeon

FWP in collaboration with the United States Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS) and U.S. Army Corps of Engineers (USACOE) are studying and monitoring all parts of the life history of pallid sturgeon in the Missouri River. This past year was the 16th consecutive year that FWP has participated in the Pallid Sturgeon Population Assessment Program, a monitoring program designed to evaluate survival, growth, distribution, migrations, and physical condition of pallid sturgeon.

Adult migration is monitored using surgically implanted radio telemetry tags. Tagged fish are monitored using ground-based telemetry stations situated up and down the Missouri River as well as manual tracking using jet boats. Newer technologies allow for biologists to see real time fish movement from their office, since the data are accessible through a cellular network. This has helped reduce the need to manually download stations that can be greater than 50 miles apart.

As for adult migration, 2021 was a very uneventful year on the Missouri River. Severe drought conditions lead to low river discharge throughout the spring and early summer season, which equated to very little movement of adult pallid sturgeon up the Missouri River. Manual and remote telemetry tracking of radio tagged pallid sturgeon indicated that pallid sturgeon did not make spawning migrations up the Missouri River all season.

Sturgeon spawning is monitored using fine mesh nets called ichthyoplankton nets that are designed to capture free drifting larval sturgeon. Settled exogenous feeding larvae are then monitored using a benthic trawl that is pulled along the river bottom. Age-1 and older sturgeon are monitored by drifting trammel nets throughout the length of the Missouri River.

Like adult movements, 2021 was uneventful in terms of sturgeon production in the Missouri River downstream of Fort Peck Dam. No free embryo sturgeon were captured in ichthyoplankton nets. In addition, 2021 had the lowest catch of young-of-the-year sturgeon captures in our benthic trawl. All data lead to the conclusion that the drought impacted both shovelnose and pallid sturgeon spawning and production.

Fort Peck Test Flows

In the world of pallid sturgeon recovery, 2021 did have a silver lining. In September the USACOE issued the Fort Peck Dam Test Release Final Environmental Impact Statement. This was a huge undertaking for the USACOE, which went through the National Environmental Policy Act (NEPA) process. NEPA is a law that requires federal agencies to assess a broad variety of impacts associated with the proposed action prior to making decisions. Using the NEPA process, the USACOE evaluated the environmental and related social and economic effects that experimental flows from Fort Peck may have.

The Fort Peck Dam Test Release Final Environmental Impact Statement was a product of years of research and monitoring of pallid sturgeon. Data indicate that the limiting factor in pallid sturgeon recruitment occurs in their early life history when free-embryos drift for several days after being hatched. Due to the mainstem dams on the Missouri River, the amount of free-flowing river has been decreased and the distance that pallid sturgeon free embryos have available to drift before being able to swim and feed is limited. Therefore, the basis of the Fort Peck Test flow is to mimic a spring freshet downstream of Fort Peck Dam which may trigger sexually mature pallid sturgeon to migrate up the nearly 200 miles of Missouri River and spawn near the Fort Peck Dam project. Over the past 20 plus years, scientist have observed adult pallid sturgeon migrating upstream during high flow.

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, these free-embryos drift into the reservoir and settle out in the muck and mud of the headwaters delta and likely die. 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. Through previous research, FWP believes that if pallid sturgeon can spawn near Fort Peck Dam, then at least a portion of their free embryos would have enough drift distance to survive.

After completing the NEPA process, the USACOE issued a Record of Decision (ROD) that Test Flows from Fort Peck Dam will occur in the future between 3 to 5 times when specific environmental conditions are met. The flow in the river will likely be a combination of water coming from the Fort Peck Lake powerhouse, Fort Peck Lake Spillway and major tributaries like the Milk River.

The proposed Test Flows are not without controversy. Many stakeholders are concerned that the disruption of “normal” operations out of Fort Peck Dam will have adverse effects on their livelihood. However, within the ROD, the USACOE has put many stipulations on how and when a Flow Test can be run to minimize impacts to stakeholders. The test will only be run if water conditions are not too high in that given year, which should minimize the chance of flooding. In addition, Fort Peck Lake elevation must be high enough to ensure the reservoir isn’t lowered to a point that negatively impacts the fishery and access to Fort Peck Lake. The rate at which discharge can be increased or decreased will be set to minimize bank sloughing and give irrigators time to move their manual pumps if needed.

Although 3.5 times the “normal” flow sounds like a lot, it’s actually very similar to the discharge observed in 2018. In that year, very few stakeholders were negatively impacted from the higher-than-normal flows.

More importantly, pallid sturgeon did migrate up the Missouri River in 2018 and may have spawned had flows not dropped abruptly during the spawning window. If you are interested or concerned that the test flows will impact you, the complete stipulations can be found on the USACOE website under the ROD or the Final EIS.
A Look at Cisco in Fort Peck Reservoir
Heath Headley, Fisheries Biologist

History/Introduction

As gamefish populations began to establish themselves in Fort Peck Reservoir in the 1960s and 1970s, FWP staff and anglers noticed changes to the overall fish community. Unfortunately, the changes observed were not ideal. Even though populations of walleye, northern pike, and lake trout were on the rise, the condition or plumpness of these sought-after sport fish wasn’t very good and they weren’t obtaining desirable sizes most anglers hoped to catch. Much of this had to do with a limited forage base that was highly dependent on flooding of shoreline vegetation. Therefore, FWP began researching possible forage fish introductions that might benefit gamefish populations; but not jeopardize the Fort Peck fishery as well as fish populations above and below Fort Peck Dam.

What influences cisco populations in Fort Peck Reservoir?

Limited ice cover appears to correlate with decreases in young-of-year cisco relative abundance on Fort Peck Reservoir. Lack of ice cover has been shown to increase wind and wave action, which increases sedimentation over incubating eggs, leading to high mortality. For example, in 1987 and 1992 the reservoir did not freeze over and resulted in very few young-of-year cisco. In contrast, ice cover occurred in December 1985 and 2000 resulting in two of the largest year classes ever produced. Similarly, ice cover lasted over 3 months in 2020 (January 15 to April 20) resulting in a strong year class.

Decreases in reservoir elevation during the winter, which dewater incubating cisco eggs, have also been shown to reduce young-of-year cisco abundance as cisco typically spawn in three to 10 feet of water. Fort Peck Reservoir experienced decreases of up to 8 feet during the winter of 1989, 1996, 2003, and 2007 resulting in low relative abundance of young-of-year cisco. In contrast, when water levels were increasing over winter of 1993-1994 and again in 2008-2009, two of the best year classes of cisco were produced. Reser-...
FISHING NEWSLETTER
2022

in Fort Peck Reservoir hasn’t gone unnoticed. Anglers have observed large “clouds” of baitfish on their sonar along with small silvery fish skittering across the water on calm evenings. This abundance has led to record setting walleye weights during tournaments along with a new state record smallmouth bass and chinook salmon occurring in 2020. Recent studies on walleye populations in North America have confirmed benefits of cisco to the health of many walleye fisheries. Specifically, water bodies containing cisco as a primary forage base were more likely to provide opportunities for a trophy-sized fish.

It should be noted those same waterbodies typically have lower catch rates because of this highly caloric and large food item present. That pattern holds true to Fort Peck Reservoir as angler catch rates average close to 0.4 walleye per hour during the summer creel period. Not only do walleye have more cisco to eat when they’re abundant, but they also follow cisco to deeper water as summer water temperatures warm which make them difficult for anglers to catch. It’s not uncommon for fisheries staff to conduct deep water netting in 60-to-100-foot of water!

The unique niche that cisco have found in Fort Peck Reservoir has been truly remarkable. Some fisheries management practices (i.e., predator/prey fish stocking, fishing regulations, etc.) haven’t lived up to their expectations and others have even caused negative, irreversible damage to the existing fishery. It’s important to remember that no two waterbodies are identical because of differences in size, species composition, habitat, productivity, and angler use. Therefore, biologists are often unable to take a one-size-fits-all approach when it comes to managing a fishery.

Cisco taken from a walleye stomach.
Cisco taken from a northern pike stomach.
Missouri River Archery Paddlefish – What We Know

Jared Krebs, Fisheries Biologist

The Fort Peck Dredge Cuts provide a unique and exciting opportunity for anglers to harvest paddlefish using archery equipment in lieu of traditional snagging gear. This fishery provides a mid-summer (July 1 – August 31) change from hook and line angling, with tag holders “hunting” for paddlefish by boat, atop homemade platforms with bow and arrow in hand.

Currently, there is no quota regulating the number of paddlefish that can be harvested annually in the Dredge Cuts. Additionally, archery paddlefish tags (blue tags) are available over the counter to both residents and nonresidents alike. Availability of these tags and a general rise in bowfishing participation has caused this fishery to grow in popularity since it started in 2007. While the number of fish harvested annually has been sporadic, tag sales and total angler days have increased since 2011. Biologists are working to quantify bowfishing participation in the Dredge Cuts and throughout Montana in an upcoming survey.

With increased angling pressure comes a need for increased monitoring of paddlefish inhabiting the Dredge Cuts. Self-creel stations installed prior to the 2021 season provided anglers an easier route for mandatory reporting their harvested paddlefish, as well as submitting a dentary (jaw) sample to biologists. Jaw samples allow biologists to obtain important information regarding age and growth of paddlefish, and thus make informed management decisions. Aging data from Dredge Cut paddlefish suggest slower growth than paddlefish that live primarily in the nearby Missouri River. This is likely due to more a productive environment in the river and Lake Sakakawea in North Dakota where these migratory fish spend part of the year.

Finally, tagging efforts throughout the connected Missouri and Yellowstone rivers have provided insight into the seemingly continual mixing of paddlefish found in and around the Dredge Cuts. Paddlefish previously tagged in the Yellowstone River as well as the Missouri River above Fort Peck have been harvested in the Dredge Cuts. Moreover, paddlefish tagged in the Dredge Cuts have been harvested downstream near Intake Diversion Dam on the Yellowstone River. Biologists need to better understand where Dredge Cut paddlefish come from and their movements. Are they produced in the Dredge Cuts or are they spawned in the lower Missouri and Yellowstone Rivers and reside in Lake Sakakawea for some period before migrating upriver? To answer this question, biologists will ramp up efforts to monitor this unique population. This will include working with anglers on reporting harvested paddlefish, as well as tagging and tracking of Missouri River and Dredge Cut paddlefish.

As the Dredge Cut archery fishery popularizes, it becomes even more important for successful anglers to report their harvested fish. This includes submitting jaw samples along with length, weight, sex, and when the fish was harvested. Those that submit all the required information will receive a paddlefish hat in the mail. Increased knowledge of the paddlefish population in and around the Dredge Cuts will allow FWP to continue to ensure the sustainability of this ecologically important native species.

Successful angler Evan Guenther with a 79.7-pound paddlefish harvested in the Dredge Cuts.
Fishing Newsletter

2022

Fresno Management Plan - Why Deviate from Wild Fish Management

Cody Nagel, Fisheries Biologist

Fresno Reservoir has been a popular northcentral Montana walleye fishery for decades, consistently producing good numbers of eater sized walleye that range from 12-20-inches. Historically, walleye management on Fresno had relied on natural reproduction to sustain the population due to favorable spawning habitat and a history of successful walleye spawning in most years. Anglers understand that consistent forage production is key to a sustainable and healthy walleye population. However, in Fresno, highly fluctuating water levels, especially severe drawdowns tend to occur at least once every ten years. This results in a ripple effect on forage production that impacts the fishery over a multi-year period.

In 2003, hatchery reared walleyes were stocked in the reservoir due to severe declines in walleye abundance stemming from severe water drawdowns. Walleye abundance quickly rebounded, and stocking continued with little regard for forage and other sport fish. In 2012, an evaluation was completed by FWP that indicated wild walleye reproduction and recruitment was significant. Declining walleye size structure (PSD) following record high relative abundance in gillnets (2010) suggested that cessation of walleye stocking and relying on wild walleye reproduction would lower relative abundance and potentially improve walleye size. A concurrent goal of this management action was to reduce predation on the limited forage base. The management goal under this no-stocking strategy was: Maintain a balanced fish community that promotes walleye growth, age and size structure while ensuring a sustainable forage base.

Under this strategy, walleye relative abundance decreased from an average 24/net (2006-2013) to 17/net (2014-2021). Size structure continued to decline after 2011 reaching a record low of 24 in 2015. This metric increased to 61 in 2017 and has since maintained a balanced size structure (PSD 30-60).

In 2020, a petition was circulated in the Havre area requesting that FWP stock fish in Fresno Reservoir. This resulted in a public meeting in April 2020 where over 60 interested individuals were in attendance. The outcome of this meeting was the impetus for FWP to initiate a fisheries management plan process that relied heavily on public involvement to guide management decisions.

With the help of an Advisory Committee, FWP began the process of developing a plan that incorporated angler expectations while recognizing factors such as water management, habitat and forage abundance that influence the health of the walleye population. Angler expectations were clear; stock walleyes to improve catch rates of eater sized walleye that Fresno has a history of producing. The Management Goal under newly adopted plan is: The Fresno Reservoir fisheries will be managed as a walleye fishery with the primary goal of high angler catch rates for Stock (10-15") and Quality (15-20") walleye. This will be accomplished by stocking hatchery walleye to augment the wild walleye population. An emphasis will be placed on habitat enhancement efforts to support other species of interest (yellow perch, black crappie and forage species).

Under this Management Goal, angler harvest of walleyes is essential to maintain a healthy fishery and to ensure the walleye population and size structure remain balanced with the limited forage. Wild fish management remains a key component for walleye and other species such as northern pike, black crappie and yellow perch. The management plan emphasizes habitat improvement and water level management as factors that influence the reproductive success and recruitment of these species in Fresno.

Detailed information on the 10-year Fresno Fisheries Management Plan can be found online at fwp.mt.gov.
Pond Management - Wild Fish Transfers
Cody Nagel, Fisheries Biologist

FWP manages over 100 small ponds and reservoirs located on both public and private lands throughout Region 6. The fisheries are very diverse and rely on stocking strategies to increase angling opportunity and provide an immediate response to winterkills that often occur in northeastern portions of Montana.

State hatcheries accommodate the requests for trout, largemouth bass, walleye and channel catfish. However, hatchery space is often limited and can’t support all the species anglers prefer to target, such as panfish. To meet these needs FWP relies on wild reproducing fish populations to act as donor populations that can be used to stock other nearby waterbodies, referred to as wild fish transfers.

Some ponds in eastern Montana provide the perfect environment for species such as black crappie, yellow perch and bluegill to naturally reproduce, and sometimes even overpopulate. When a donor population is identified a series of steps take place before any fish are moved and stocked elsewhere. First, fish health assessments need to be done to make sure no pathogens or disease are found in the potential donor fish and the waterbody is sampled to see if any aquatic invasive species are present. Disease and AIS testing frequently occur on the fish population and waterbody if it maintains a donor source classification. If both are negative, the biologist then fills out a wild fish transfer request that identifies the donor and receiving waterbodies, an environmental assessment and public comment period also occurs if a new introduction is being proposed.

Once approved, fisheries personnel deploy trap nets and start the process of moving the fish. Most wild fish transfers occur in the spring when water temps are cold and less stressful on the fish. It’s also a time when many adult females are still carrying eggs which they can lay at the new waterbody they’re being transferred to. FWP then follows up with additional sampling efforts to see if the transfers are successful and natural reproduction has occurred.

Region 6 currently has 10 donor ponds and has stocked thousands of adult and juvenile panfish from wild donor populations at dozens of waterbodies within the region. This effort reduces overpopulated ponds and provides immediate fishing opportunities to Montana anglers.
Sauger and walleye counts during fall electrofishing surveys on the Lower Yellowstone River, between Hysham and Sidney, were higher than seen in recent years. Sauger were caught at a rate of 11.7 fish per hour of electrofishing, which is within the normal range of the long-term data set but up from the last two years counts. Walleye were caught at a rate of 4.9 fish per hour, which is a record high for the long-term data set that goes back to 1998. Abundances of these popular sport fish in the Lower Yellowstone River have benefitted anglers who took advantage of the unusually long fishing window (August-November) afforded by the drought conditions. Both species are managed as wild fish populations, putting the focus on maintaining the quality and connectivity of habitats necessary to allow these populations to spawn and recruit naturally without hatchery augmentation. This approach has resulted in a sauger population that is well adapted to the widely varying conditions of the Lower Yellowstone River from the high flood waters observed in 2011 to the current drought and everything in between. Walleye, while not stocked directly into the Lower Yellowstone River by FWP, have undoubtedly benefited from the ongoing stocking efforts on Lake Sakakawea in neighboring North Dakota. Tagging data has revealed a connection between Yellowstone River walleye and Lake Sakakawea, particularly the strong run of river spawning walleye that makes their way into Montana each April. The abundance of walleye throughout the Yellowstone River observed in fall trend surveys from Hysham to Sidney may become a more common occurrence as the fish passage around Intake Diversion Dam nears completion. While current drought conditions for sauger and walleye on the Yellowstone River are near ideal for anglers, fishery managers are looking forward to a break in the drought knowing that better water years while difficult for angling are essential for successful spawning and recruitment of the next crop of fish that will ensure quality angling into the future.
Ponds, Drought, and Wild Fish Transfers
Southeastern Montana Ponds
Kevin McKoy, Fisheries Technician and
Caleb Bollman, Fisheries Biologist

Pond fishing in eastern Montana was good following a 2019 spring runoff that filled ponds across the region. Unfortunately, two years of persistent drought substantially reduced pond fishing opportunities and many ponds risk a winter kill. The ponds managed in the regional pond program, are mostly on private land and require landowner permission to fish. In exchange for stocking fish, landowners allow public access for fishing. Ponds are stocked with a variety of fish including bass, catfish, crappie, northern pike, perch, trout and walleye. About one third of the ponds are sampled by FWP each year and survey results are summarized in the Region 7 Pond Fishing Guide. State hatcheries stocked 58 ponds in Region 7 in 2021 and regional staff conducted wild fish transfers to 3 ponds. 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 2022 guide should be available by mid-March 2022. 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 every time before fishing. It is the responsibility of the fisherman to look up the landowner’s phone number and request permission to fish.

Many of our prairie ponds are managed as put and take fisheries, receiving annual stockings of fish from the Miles City Fish Hatchery. Others are managed as wild fisheries relying on natural reproduction to sustain the fishery after an initial stocking or wild fish transfer to get the fishery started. One such pond, Marshall Reservoir located near Mildred, on BLM land had a thriving largemouth bass population in 2021 with a high density of bass averaging one pound and some up to five pounds. Drought had reduced the water level so that a winter kill in 2021/2022 was highly likely and any fish that would survive would die during a planned drawdown in 2022 for BLM to rebuild the dam. This reality provided an opportunity to do a wild fish transfer, salvaging these bass to the benefit of angler’s creels at Spotted Eagle Lake in Miles City. During fall 2021 a total of 1,303 largemouth bass were salvaged and transferred to Spotted Eagle. The wild fish transfer management tool was also used at Baker Lake when fall surveys found drought had led to poor spawning success of yellow perch and crappie, the primary forage base in the newly rebuilt and restocked lake. This lack of small forage fish had caused an acute problem that appeared to only affect a strong year class of walleye that are a year or two away from harvestable size resulting in poor overall condition. A total of 650 pounds, over 100,000 fathead minnows were transferred into Baker Lake in hopes of improving condition of these smaller walleye and getting them through the winter and into angler’s creels.

Kids fishing McNabb Pond near Ekalaka.
A Little Bit of Fin Gives A Lot of Information for Wild Fish Management

Ryan Kovach, FWP Fisheries Geneticist and Andrew Whiteley, University of Montana

Remarkably, many decisions concerning native fish conservation in Montana are informed by a clip of fin tissue about the size of a hole punch. Tiny bits of fin hold invaluable secrets packaged into the building block of all life: DNA.

Genetic data have been integral in Montana’s fish management since 1976, when Fred Allendorf and Robb Leary at the University of Montana began producing genetic data that revolutionized how we manage hatchery broodstocks and wild fish populations. By the late 1970s, FWP had officially partnered to work with Fred and Robb, thereby establishing a collaborative relationship between the University of Montana Conservation Genetics Lab and FWP that continues to this day. Fred and Robb were genetic pioneers that literally wrote the book on the field of Conservation Genetics (Fred) and won some of the most prestigious awards in evolutionary biology (both Robb and Fred). We’re fortunate they focused their efforts on the fish found throughout our state.

Today, genetic data and theory provide a foundation for much of our fish conservation efforts. Here, we provide examples of how genetic data are used to monitor the status and trend of wild fish populations throughout the state. Amazingly, genetic data can inform three fundamental questions in wild fish management: (1) what am I looking at; (2) how many of these things are there; and (3) where did they come from?

Management of wild fish populations requires accurate identification of the species captured during monitoring efforts (e.g., electrofishing), but unfortunately, that can be quite challenging. Many fish are “cryptic” meaning that closely related species can look identical, a dilemma that is more pronounced when trying to discriminate between different larval fish species. Imagine trying to differentiate between shovelnose and pallid sturgeon larva that are one centimeter long (Figure 2) - not even the best fish taxonomists in the USA can do it. Similarly, many of our native and non-native fish species hybridize (interbreed with one another), with the “cutbow” being the most familiar example for many anglers in Montana. While biologists can easily identify a “cutbow” that is composed of 50% rainbow trout and 50% westslope cutthroat trout genes, a cutbow that is 95% westslope cutthroat trout, and 5% rainbow trout often “looks” like a cutthroat trout. Clearly, looks can be quite deceiving. DNA unlocks these mysteries, letting us know what species we are dealing with, and even the percent ancestry of hybrid individuals.

We then need to figure out how many of these things are there? Specifically, we need to know whether we are dealing with multiple populations of fish, and how many individuals there are in each population. Again, genetic data provide critical information for a difficult and sometimes intractable problem. Some of the earliest applications of genetic data in Montana described genetic differences among fish sample collections and therefore, quantified how many unique populations of fish exist for various fish species. Results vary widely. For example, almost every stream in western Montana harbors a genetically unique population of westslope cutthroat trout, but sauger are fairly homogenous over the entire state, suggesting they were essentially one large population prior to dam construction (though sauger in the

Robb Leary (right) and Fred Allendorf (left) on a genetic sampling trip to Lake Evangeline in 1981.
trout populations are extraordinarily different from one another; bull trout in the North Fork Blackfoot River are substantially more genetically different from bull trout in Monture Creek (i.e., neighboring streams) than humans from different continents! Identifying population of origin provides critical information on fish movement – no GPS needed – and population productivity – which populations produce the most fish – across the large landscapes we have in Montana.

Since 1976, biologists from across the state have annually collected thousands of genetic samples from various fish species across the state. From those fin clips we’ve built a mountain of information that we use for broader agency prioritization and project-specific decision-making. What does this mean for the general angling public? By using genetic data to better inform the status and trend of our wild populations, we are working to simultaneously ensure we conserve the populations of the present, and the evolutionary future of our wild fish.

Last, we often need to identify where a particular fish came from. This can be a biological question (who were the parents?), or a spatial question (where was this fish born?). Currently, we are using genetic parentage to identify the specific parents that produce offspring in fish translocation efforts throughout the state. This helps us strategize future translocation efforts (e.g., what populations do we use and how many individuals do we release?), and compare various methods of fish translocation, both of which help us improve future conservation efforts. Similarly, we use genetic data to identify population of origin for our migratory fish species captured in mainstem or lake environments. For example, we use genetic data to tell us exactly where a bull trout captured below Johnsrud Fishing Access Site on the Blackfoot River was originally born, and its genetic history - the equivalent of 23andMe but for our wild fish. This is possible because bull trout populations are extraordinarily different from one another; bull trout in the North Fork Blackfoot River are substantially more genetically different from bull trout in Monture Creek (i.e., neighboring streams) than humans from different continents! Identifying population of origin provides critical information on fish movement – no GPS needed – and population productivity – which populations produce the most fish – across the large landscapes we have in Montana.

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![Larval fish collected during seining efforts in the Missouri River above Fort Peck. Fish in this photo may be pallid sturgeon, shovelnose sturgeon, or paddlefish. Genetic analysis are used to ID these and many other samples.](image)

The number of effective breeders, analogous the number of successfully spawning fish, in the Big Hole River Arctic grayling population between 2007-2020.
Water quality, water quantity, and physical habitat are essential to successfully manage wild fish. A three-legged stool is a useful analogy, because if one or more of the legs fails, the stool can’t stand up. Fish need to spawn, hatch, rear, and grow into sexually mature adults to complete their life cycle, and each stage requires different elements.

Water quality can be taken from basic values of temperature, dissolved oxygen, and pH, to more complex measurements such as concentrations of suspended fine sediment particles, nutrients, and heavy metals. Different species of fish have varying tolerances to survive, and younger fish are less tolerant to stressors (overall), mostly because their breathing rate is much faster than larger (older) fish. If water quality fails to meet the basic needs for fish species to survive at a given life stage, then wild fish management is not sustainable.

It seems obvious, fish need water, but the timing and quantity of water can have considerable benefits or consequences for fish. The critical period for trout often occurs late summer, when spring flows have dropped off, irrigation demands are highest, and sunlight exposure is at its peak, causing higher water temperatures and sometimes leading to excessive aquatic plant growth. Although plants create oxygen during the day, they use oxygen at night, which could lower water oxygen to levels that cause stress in fish. Low water levels in shallow lakes and small reservoirs in the fall can lead to winter kills when there is limited capacity of the water to support a fish community through the winter.

Each life stage of fish has specific physical habitat requirements. Trout seek out gravels in riffles and pool crests for spawning that are loose and not cemented with fine sediment. These small spaces between the rocks are then needed for juvenile trout to grow into adults. Human activities that cause excessive erosion of streambanks, can degrade these critical habitats and make wild fish management challenging.

Of the three legs of the habitat stool, it could be said that water quantity is most important because it alone can improve water quality through dilution of contaminants and lowering water temperatures, while also improving physical habitat by cleaning out fine sediment through flushing spring flows, and providing access to spawning habitats. FWP partners with numerous groups in Montana to keep strengthening the three legs of the habitat stool for sustainable wild fish management.
AIS Early Detection
Tom Woolf, AIS Bureau Chief

Early detection of aquatic invasive species (AIS) is an important part of how FWP helps protect wild fisheries. AIS such as invasive mussels, snails, crayfish and weeds degrade habitat, reduce available food and out-compete desirable species. FWP staff and a variety of partners annually survey waterbodies around the state looking for new populations of AIS. Identifying new populations of AIS as early as possible helps contain spread and increases the chances for successful eradication.

In 2021, over 300 waterbodies were surveyed in Montana with over 4,000 early detection samples collected. The samples were processed by the FWP AIS labs in Helena and Kalispell where they were analyzed for invasive mussel larvae and other AIS. No invasive mussels were found in the Montana samples collected in 2021, but a number of new populations of invasive snails, weeds and crayfish were identified by field crews.

New Zealand mudsnails (NZMS) are a small invasive snail species that have been in Montana since the 1990s. The snails can clone themselves and can be transported easily on wading gear and boats. NZMS can survive being eaten by fish and can out-compete native insects that are important food sources for fish. In 2021, several new populations of NZMS were identified including the first established wild populations west of the Continental Divide in Mitchell Slough along the Bitterroot River. This population was most likely introduced by “hitchhiking” on angler’s boots and fishing gear. It is important to always clean your boots and gear before using in a different waterbody to help ensure you are not moving NZMS and other AIS.

Some good news from the 2021 season includes finding no evidence of zebra or quagga mussels in Tiber Reservoir. Intensive sampling over five years has found no further evidence of invasive mussels since they were detected in 2016. Efforts are underway now to delist Tiber as an “invasive mussel positive water” and remove decontamination requirements from Tiber Reservoir.

FWP is asking everyone to keep a lookout for AIS and report anything suspicious or out of the ordinary. Reports can be made online at CleanDrainDryMT.com or by calling 406-444-2449.
Montana is home to some exceptional aquatic resources. Management efforts focus largely on wild, self-sustaining fish populations, but also utilize hatchery fish when it is necessary and appropriate. Montana’s Fish Health Program is charged with keeping both hatchery and wild fish healthy and with helping to manage the risk of introducing and spreading harmful fish pathogens. To help assess this risk, routine and diagnostic testing is done to gain insight into which pathogens may be present and which diseases may be affecting those fish. Routine testing involves testing a subset of a population to determine if specific fish pathogens are present. While we can never be certain that harmful pathogens or disease are not present, this routine testing is a great tool to help us manage the risk of introducing pathogens into new environments when fish are moved from one body of water to another. Diagnostic testing is used when fish, wild or hatchery, display signs of infection and it involves a thorough investigation in the cause of the disease using a variety of tools and techniques. While the treatment of disease in many cases is not practical or feasible, this knowledge is crucial to helping keep fish populations healthy over the long haul.

With a staff of two people, FWP’s Fish Health Program is relatively small. Collaborative partnerships with other labs, such as the Bozeman Fish Health Center (U.S. Fish and Wildlife Service), are crucial to program success and give us access to additional tools, techniques, and expertise.

Another responsibility of the program is to regulate and monitor the transfer of fish coming in from out-of-state. In Montana it illegal to bring fish into the state without an import permit. Out-of-state fish sources are assessed on several factors that include looking for diseases and aquatic invasive species. By scrutinizing the importation of fish, we reduce the risk of introducing harmful exotic fish pathogens from out-of-state sources and provide a higher level of protection for Montana’s aquatic resources.
Big Springs Trout Hatchery, located seven miles south of Lewistown, is Montana’s largest cold-water production facility. In 2021 Big Springs raised brown trout, kokanee salmon and five strains of rainbow trout. The hatchery operated at full production throughout the year and offered assistance to both Bluewater Springs Trout Hatchery (Bridger) and Giant Springs Trout Hatchery (Great Falls) with some of their production needs.

We faced a few major obstacles this year with water levels, quality and temperature all across the state. Due to the hot temperatures and drought this summer, several of the hatchery’s planned plant requests needed to be redirected into more suitable water or rescheduled until favorable conditions returned. As cooler weather returned in the fall, normal stocking operations resumed.

One notable change to our operation for 2021 was the increase in the request for wild spawned Holter Eagle Lake rainbow trout. Every year in April, hatchery staff along with regional fisheries staff tackle the important job of collecting wild eggs from Eagle Lake rainbow trout out of Holter Reservoir. What made this a special year was the number of eggs collected. Around 750,000 eggs were taken in 2021 compared to 400,000 in previous years. Normally Big Springs takes around 300,000 eggs and Giant Springs Trout Hatchery takes 100,000 to be raised at the hatchery and stocked the following year in both Holter (Big Springs) and Hauser (Giant Springs) reservoirs. This year Bluewater Springs joined in on the fun to collect eggs for rearing fish destined for Clark Canyon Reservoir. A project such as this takes weeks to complete and is vital to the success of the different recreational fisheries it supports.

Nearly 1.2 million rainbow trout weighing 116,378 pounds were raised and stocked into the following waters: 16 large reservoirs, 37 small reservoirs and ponds, 7 urban waters and 2 rivers/streams. Brown trout totaled 41,264, weighed 2,055 pounds and were stocked into two tribal fisheries near Browning. Kokanee salmon totaled 156,780 fish weighing 1,526 pounds stocked into five different in-state fisheries.
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Yellowstone River Trout Hatchery
Chris Phillips, Hatchery Manager

The primary role of the Yellowstone River Trout Hatchery (YRTH) is to manage and propagate the Yellowstone cutthroat trout broodstock, referred to as the Lehardy strain. The hatchery manages the genetic integrity and overall health of the Lehardy broodstock to provide both eyed eggs and progeny for a variety of management objectives that include native species restoration, high mountain lake stocking, urban fisheries as well as research and education. Many of FWP’s native fish restoration projects that are conducted within the Yellowstone River region have utilized fry or fingerlings from the Lehardy broodstock for fish re-population. Once completed, these projects become important native species management areas for FWP.

The high mountain lakes stocking program is also a very important part of the hatchery’s mission at YRTH. Each year, 35-40 lakes are stocked via helicopter with very young Yellowstone cutthroat trout raised at the hatchery. In total, more than 350 lakes in both the Absaroka-Beartooth and the Crazy Mountains are stocked on a rotating schedule. Some of the high mountain lakes that were historically stocked with Yellowstone cutthroat trout have become self-sustaining fish populations. In these lakes where the fish are reproducing naturally, fish stocking has been suspended and once again FWP is managing these lakes as wild, self-sustaining populations.

The Yellowstone cutthroat broodstock spawning season began in mid-January and ended April 10, 2021. We had a great spawning season and the broodstock generated over 846,800 green eggs. Eggs had an average eye-up of 78%, resulting in over 660,000 fry. Yellowstone River Trout Hatchery met all stocking and production goals this last year. In total, the hatchery stocked well over 100,000 fish weighing approximately 4,890 pounds.

Another important mission of the YRTH is to provide hatchery support for the conservation and restoration of native Arctic grayling within the species historic range of the upper Missouri River. The hatchery supports this program through wild spawning efforts, egg incubation and distribution as well as strategic fish stocking when necessary. The arctic grayling restoration plan has had some changes over the years and continues to provide many new challenges for us at the hatchery.

We also did annual spawning of Arctic grayling at both Axolotl Lake and Green Hollow Reservoir II in May. We had a good year with 528,776 eggs collected from 337 females. The eggs were incubated here at the YRTH and then transferred to RSI’s (Remote Site Incubators) located throughout Southwest Montana. We also conducted a spawning event on the Big Hole River to collect eggs from wild fluvial Arctic grayling. We were able to collect eggs from 7 wild females and 14 wild males. The eggs were incubated and hatched at the hatchery and will continue to be reared here until next spring. At that time, the fish will be stocked into Axolotl (Twin Lakes) for future gene infusion with the existing broodstock.

The Yellowstone River Trout Hatchery is open 8:00 a.m. -5:00 p.m. Monday through Sunday. Tours are given during business hours and an appointment is recommended. Please contact us at 406-932-4434 or visit FWP’s website at https://fwp.mt.gov/fish.
Bluewater Springs State Fish Hatchery, located near Bridger, raises an average 1.5 million rainbow trout every year, some for catchable sized (7-10 inches) fish plants, some for put and grow (2-4 inches) fish plants, and some for forage. The focus for Bluewater is not only just to raise fish and put them in reservoirs for the angler but to maximize the return to the angler. What we have learned at Bluewater is that how we raise fish in the hatchery directly affects the number of fish that return to the angler and to our lake survey crews. After applying that knowledge to Cooney Reservoir since 2019, adjusting stocking timing, fish size, feed quality and rearing space Cooney has seen the best rainbow trout numbers in size, health and quantity than it has over the last 20 years. Providing anglers with a variety of opportunities, like Cooney Reservoir, allows people to take home a fish without negatively affecting the wild populations.

Bluewater hatchery is also working with biologists on Clark Canyon Reservoir to evaluate the survival of several rainbow trout strains. In order to maximize return to the angler, the Dillon area fisheries biologist and crew are working with hatchery staff to develop a new stocking plan. Four strains of rainbow trout are being evaluated: Arlee, Gerrard, Eagle Lake from California, and Eagle Lake from Holter Reservoir. In order to tell the difference between strains, hatchery staff feed the fish Oxytetracycline which makes a glowing ring, visible under black light, on the vertebra of the fish. One strain gets three marks, one strain gets two...until the last strain gets none. Fish are then planted by boat to assure maximum distribution on the reservoir and to avoid predation by birds. Look for these results coming soon.

Bluewater also started raising arctic grayling for Chiquita Lake located in the Spanish Peaks. Wild management for graying is a very important aspect for the conservation of the species. The grayling eggs were from
a wild spawn on Rogers Lake near Kalispell and hatched and raised to five inches at Bluewater then planted into Chiquita Lake via a helicopter. 2022 stocking request for grayling from Bluewater have increased, so look for more grayling plants into Hebgen Lake and its tributaries in 2022.

The Bridger Girl Scout Troop 2063 came out in May and planted flowers and bushes in front of the fish hatchery. Not only do we care about the fish, but we sure like to take care of the hatchery, and flowers are always a crowd pleaser. Hatchery staff continue to clean out aeration towers of sediment to better aerate water for the fish.

These are just a few of the highlights from 2021. There are many other projects that are just as great going on at the hatchery, with several people working hard to help fill the angler’s creel. If you find yourself traveling highway 310, don’t be a stranger! Please stop in to get a tour and perhaps help feed fish.

Fort Peck Multispecies Fish Hatchery
Ryan Lott, Fish Culture Specialist
and Wade Geraets, Hatchery Manager

The Fort Peck Hatchery, along with the Fort Peck Reservoir crew and numerous volunteers from around Montana come together each spring for the annual walleye spawn on Fort Peck Reservoir. Fish are trapped and spawned to collect eggs from the wild adults that roam the reservoir. The eggs are divided between the Fort Peck Hatchery and the Miles City Hatchery to be raised as either fry or fingerlings. Fry (the majority) are released within 28 days, but some fingerlings are raised in rearing ponds for 60 days. Most are returned to Fort Peck Reservoir, but some are stocked in other reservoirs in central and eastern Montana. Although Fort Peck Reservoir does have a small wild population of walleye that spawn on their own, we supplement that stock because the wild population cannot sustain itself in such a large body of water. This gives anglers the chance to chase the elusive walleye, not only in Fort Peck Reservoir, but in many other reservoirs, with a chance to catch a fish of a lifetime.

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Chinook salmon were introduced into Fort Peck Reservoir in 1983. This population is one of three which includes Lake Sakakawea in North Dakota and Lake Oahe in South Dakota. These wild populations are the only disease-free, land-locked chinook salmon in the lower 48 states. When the Fort Peck Hatchery came on-line in 2006, a goal was developed to produce a quality salmon population in Fort Peck Reservoir. Our efforts are paying off in the result of a trophy-class fishery. Anglers have an opportunity to hook into a wild 25-30-pound chinook salmon in just three to four years of growth. We not only see anglers taking advantage of the quality fish, but during the salmon spawn we see healthy, good size fish returning. Some years are definitely better than others, but the quality of fish we are seeing results in better-quality eggs that are collected during the spawn.

Most people are aware that the rainbow trout stocked in Region 6 are hatchery-raised and not wild fish. While correct that these fish start in a hatchery, many don’t realize these fish provide a wild fish aspect to our area. Fish are in the hatchery a maximum of 10 months (the Arlee/Erwin strain) and the majority (the Arlee strain) are in the hatchery only five months. These trout will usually survive up to seven years in the wild. Trout give anglers in Northeast Montana opportunities to fish in areas that are a short distance from the angler’s home, with minimal equipment required to catch. By stocking trout in community and kid’s ponds in the region, the hatchery provides an angling opportunity to local people that may not get the opportunity to fish Region 6’s larger impoundments. So, the hatchery is giving the trout a boost to survive in the wild at a young age, but most of the trout’s life is spent in the wild for all to enjoy.

Northern pike provide great angling opportunities throughout Region 6. Fisheries staff collect and spawn wild adult northern pike on even years. The reason northern pike are not collected and spawned every year, is that fish do very well once established in the wild. When northern pike are stocked into smaller ponds and reservoirs with a good food source and proper spawning habitat, they may need only one or two stockings before a wild population is established. Once a population is established the fish obtain good size in a short period of time, which provides excellent angling opportunities on smaller bodies of water. The wild population in Fort Peck Reservoir provides the only disease-free egg source that fulfills the stocking needs for Montana.
Giant Springs Fish Hatchery
Jerick Graves, Fish Culture Specialist

In 2021 Giant Springs State Fish Hatchery (SFH) staff drove more than 15,000 miles of Montana’s highways and gravel roads to stock nearly 700,000 rainbow trout and kokanee salmon which weighed over 76,000 pounds. This was the first year since 2017 that Giant Springs SFH has been able to run at full production and the first time since 2003 that kokanee have been stocked from this facility.

Giant Springs SFH has been assisting with the Willow Creek Reservoir study being performed by fish biologist Katie Vivian. Three hatcheries, Giant Springs SFH, Blue Water and Big Springs, are working to restore trout populations in the reservoir. For its part, Giant Springs SFH supplied 30,000 Arlee strain rainbow trout that were marked with coded wire tags and 30,000 Eagle Lake strain rainbow trout that were marked with adipose clips and oxytetracycline.

This year Giant Springs SFH worked with the aquatic invasive species (AIS) program to take some preventative measures to make the hatchery more secure. The Missouri River is known to have New Zealand mud snails, an invasive species that can outcompete or displace native snails, mussels, and aquatic insects which our wild fish spe-

cies depend on for food. Working with NorthWestern Energy, the reservoir was drawn down about three feet in elevation to expose critical hatchery infrastructure. While the reservoir was down, we cleaned the outflow pipes for the hatchery and pressure washed the race-way sumps with high temperature sprayers to kill any invading organisms. After that, thin sheets of copper were installed on those surfaces which the snails might try to cross. New Zealand mud snails, as well as other snails and slugs, don’t like copper and will actively avoid it. By ensuring that Giant Springs SFH remains clean of AIS, we can do our best to prevent the spread of these harmful species throughout the state.

Unfortunately, Giant Springs SFH display pond was the target of vandalism in August of 2021 when someone scaled the fence to kill and wound several of the largest and oldest trout. The shock of such an egregious action was felt by many across the state, and the tremendous outpouring of kind words from the public has been immensely appreciated. One person even offered to increase the reward by an additional one thousand dollars in hopes of finding any information. As of now, there have been no developments, but we are still hopeful that someone may come forward with helpful information.

The crew at Giant Springs SFH is always glad to help with fish spawns at other facilities, and this year was no exception. Culturists Jerick Graves and Ashley Hammans helped at the Murray Springs Trout Hatchery, while Ashley also made trips to Jocko River Trout Hatchery and the Holter Reservoir wild rainbow spawn.

Due to Covid-19, the tours at Giant Springs SFH were still limited. However, a few school groups were able to come by and see the facility. We at Giant Springs SFH hope that 2022 brings with it good health and tight lines for all our Montana anglers and wish you a happy fishing season.
We made necessary upgrades, emergency plans were refreshed, and fish production successfully continued.

We planted seven waterbodies with over 12 million walleye - the majority going to Fort Peck Reservoir. This year we also had the opportunity to plant 10,000 late large 4”-5” walleye. In addition to walleye, we planted young channel catfish and bluegill. By planting fish at various life stages, we hope to enhance the fishery for angler opportunity and create naturally sustaining wild fish populations.

Our largemouth bass numbers showed improvement from 2020 despite high predation on broodstock in rearing ponds from herons and osprey. With a broodstock ranging from three to sixteen years old, we successfully harvested and planted over 115,000 fingerlings with the intention to create naturally sustaining wild populations in ponds across Montana. Unfortunately, drier weather conditions created abnormally low water levels, limited vehicle access due to potential fire danger, and in some cases, dewatered reservoirs.

Miles City was involved in the propagation of endangered pallid sturgeon for many years until an unusual problem occurred at the hatchery. The young sturgeon began to develop a deformation of the fins called, appropriately, ‘fin curl’. Propa-
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Fishing was halted for a few years while hatchery personnel worked to uncover solutions to this problem. After two years of performing studies on the young fish using different water supplies, we enter 2022 grateful for the ability to get back into the production of native pallid sturgeon once again. We work closely with the Garrison Dam National Fish Hatchery in North Dakota to grow the designated number of individuals. These individuals consist of multiple family groups which are underrepresented in the Upper Missouri. We will rear these sturgeon in our facility until they are large enough to be tagged and released, to continue their life in the wild.

We started the off-season by draining our holding reservoirs as we have done in previous years for aquatic invasive species prevention. We also had the opportunity to excavate our upper reservoir from years of built-up river silt, perform water line maintenance, and repair underground valves with the help of a local contractor.

In early May 2021, we gained Josh Culver as a fish culturist. He came into his position here with a strong background in fish culture including 20 years of experience working in both Washington and Montana. His fish knowledge and vocational skill set has undoubtedly shown to be a crucial asset to our crew at the Miles City Fish Hatchery.

Many lakes in this area, such as the Eureka Chain Lakes, are not capable of providing an environment to sustain natural fish spawning or recruitment. Through the hatchery stocking of these lakes, new recreational opportunities are provided to the public and angling pressure on wild fish in local streams or rivers is reduced.

Through the use of public outreach and educational programs, hatchery fish can be ambassadors for wild fish. These programs inform visitors how habitat loss or degradation negatively impacts fish, how “bucket biology” negatively impacts native fish, or how purchasing a fishing license can positively impact fish. Murray Springs stocks many family fishing ponds which...
creates opportunity for people to be healthier by getting outdoors, getting hooked on fishing, and learning about the many species of fish in Montana.

**What is your definition of a wild fish?**

For some, a wild fish might be defined as a fish that was hatched in a natural setting, spent its entire life in a natural setting, and whose parents and grandparents (genetic inheritance) also spent their lives in a natural setting. Some questions to define a wild fish might include: adult fish collected from a natural setting and brought to a hatchery for spawning efforts - are the progeny wild? If a hatchery stocks a two-inch fish and the fish adapts to the natural setting, spawns in the natural setting, and lives to a ripe old age in a natural setting - are those wild fish?

The characteristics of what constitutes a wild fish can be debated, but what we do know is that hatchery fish help sustain wild fish populations. The ability to conduct scientific research studies on hatchery-reared fish in a controlled or manipulated environment has led to answers that have helped fisheries managers apply science-based decision making to wild fish populations. These types of studies have provided answers to things related to: the concentration of chemicals or pollutants fish can tolerate; non-lethal methods for accurately determining the onset of fish reproduction; and have filled gaps in the life history stages or biological requirements of fish species.

Whatever your definition of a wild fish might be, the Murray Springs Fish Hatchery provides some great recreational opportunities to the far northwestern portion of our great state while protecting some of the important native fish.

Flatehead Lake and Rose Creek Hatcheries and Wild Fish Management

Mark Kornick, Hatchery Manager

Flatehead Lake Salmon Hatchery and Rose Creek Hatchery are in the Flathead valley near Kalispell. These hatcheries utilize spring water sources to rear cold water species used to enhance lake and reservoir fisheries across the state. Although kokanee salmon production is the primary objective, westslope cutthroat, Arctic grayling, and brook trout are also hatched and grown. Westslope cutthroat eggs are received from Washoe Park Hatchery in Anaconda, but the kokanee, grayling and brook trout eggs are sourced from wild environments where mature fish are captured and spawned by hatchery staff. Arctic grayling are spawned in May from Rogers Lake, near Marion, MT, and the brook trout in November from private lakes near Eureka, MT. Then there’s the kokanee, a freshwater version of the sockeye salmon.

**Wild Eggs - Kokanee Edition**

The month of October in western Montana is, for the most part, a pleasant time of year to enjoy outdoor experiences. October is also when mature kokanee run
the Lake Mary Ronan shores seeking suitable spawning gravels in which to reproduce. This 1,100-acre lake is a most popular kokanee destination just west of Flathead Lake. Kokanee mostly inhabit the open waters where in schools, they feed largely on plankton and insect life. At age two and a half years these fish will take on characteristics quite removed from their prior silvery appearance. Male kokanee turn a deep red color, grow larger jaws and teeth and gain a “humped” appearance. Females by this time are plump with eggs, also have a reddish blush, but lack the ferocious appearance and musculature the males exhibit. Enter the spawning crew of Flathead Lake Hatchery: a three to four-person team armed with sunscreen, polarized glasses and chest waders.

With the help of a special floating trap, consisting of a “lead” of quarter-inch netting and a rectangular holding catchment a couple hundred feet offshore, love-crazy kokanee are coaxed within range of the crew. The aforementioned lead acts as an impassable wall that directs fish to an inescapable netted room of sorts, nestled between strutted walkways floating over ten feet of water. This workspace is held fast by multiple anchors to keep the operation functioning through the occasional windstorms of autumn. During the light of day, nary a salmon is seen but by the next morning, thousands are held captive in the trap within easy reach of the able hatchery staff.

The Work Begins

In the next two to three weeks the number of “ripe” (ready to spawn) kokanee peaks, plateaus then drops off. During the first week, many of the fish are considered “green”, meaning the eggs are yet immature, but ripeness increases rapidly in both males and females in the coming days. The optimum spawning crew of four consists of one netter who scoops 20 to 25 salmon via dipnet into a hopper for two squeezers who strip eggs then milt from the salmon and finally the singular matchmaker who fertilizes and otherwise processes the eggs. All staff are kept busy for hours at a time at peak spawning season. Daily egg totals will number in the tens of thousands initially but will climb to a half million during the peak of the spawn. Eggs are disinfected and placed in incubators back at the hatchery that evening.

It is no exaggeration that this crew will handle upwards of 100,000 individual salmon in three weeks at Lake Mary Ronan. The Flathead Salmon Hatchery is tasked with incubating as many as 3 million eggs per year and at 200 to 300 eggs per female, this requires a lot of ripe individuals. To get at those ripe fish though means wading through immature fish, sorting overly abundant male fish, and re-releasing “spent” (recaptured) fish...one by one.

The Bottom Line

Although the kokanee of Lake Mary Ronan are of hatchery origin (400,000 fish stocked annually), this “wild” stock is of great importance as it produces the eggs and fish that support 30 kokanee fisheries across the state. The lake itself feeds and grows the fish needed to provide all Montana’s salmon needs while satisfying rabid kokanee anglers with large bag limits on the regular.
Sekokini Springs Hatchery and Research Facility was built to enhance and conserve the genetic integrity of westslope cutthroat trout in the Flathead Subbasin located in the Northwest region of the state. Fisheries professionals from FWP Region 1 collect wild juvenile westslope cutthroat trout from headwater streams in the Southfork of the Flathead River Basin. The fish are brought to the hatchery to be used as donor stocks for re-establishing pure westslope cutthroat trout populations in lakes that have been treated to remove non-native and hybrid populations. Hybrid removal eliminates the influx of non-native genes downstream from the lakes and secures the state’s largest interconnected stronghold for the native fish.

**Hatchery Role**

Each fish is given a unique PIT tag, fin clipped for genetic analysis, and sorted into rearing tanks by size. Results from the genetic analysis are used to remove any fish that is less than 100% genetically pure. Pellet feed is supplemented with mealworms and amphipods during the nine-month transition period. The fish are weighed and measured every six weeks and resorted according to performance. Fish that struggle to adapt to pellet feed have poor growth and are placed in “ICU” tanks to encourage growth. Tanks are covered with screens that mimic overhanging banks and reduce visual contact during feeding. Skylights ensure the fish are raised with a natural photoperiod. These protocols significantly reduce hatchery selection.
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After 1-2 years in the hatchery, the fish become sexually mature and are ready to reproduce. Spawning occurs in late May through the beginning of July. Three males are crossed with three females, when possible, to promote genetic diversity. Fertilized eggs from each cross are kept in separate incubation cups until they hatch. We record the reproductive success of individual fish so we can research factors that influence reproduction to improve performance in the future. This also allows us to equalize the contributions from each parent. Once the fry have hatched and swim-up, they are fed 8-10 times a day until they are stocked. The fry are stocked into their destined mountain lakes by helicopter, generally in the late summer and early fall. We do our best to get the fish out of the hatchery so they can acclimate to their new environment as soon as possible.

This process allows us to replicate drainage specific strains of westslope cutthroat trout to restore watersheds with independent populations of wild fish whose ancestors have evolved to thrive in the waters of Northwest Montana for thousands of years. Our work in the South Fork drainage is almost done, but our job is far from over. Our success has allowed us to branch out beyond the South Fork. We partnered with Glacier National Park biologist to use fish populations from the North Fork Flathead to restore Camas and Evangeline lakes. We have plans for work in the Middle Fork Flathead as well as the Tobacco River Drainage. Our work in native fish conservation will ensure future generations of anglers the chance to pursue our state fish in some of the most pristine waters in the world.

The last step for us is hauling fish to the many locations across the state that the biologists have deemed suitable. Here at Washoe, that’s an average of 100 water bodies each year and 250,000 fish of various sizes from 2” fry to 18” retired brood. Stocking can be done in multiple ways depending on the lake. We use trucks, ATV’s, helicopters, horses, and good old-fashioned backpacks. The drive can be up to 350 miles and take over 8 hours, so it is vital that the fish have all they need to survive the trip. We understand the loading capacities for each of our tanks, coolers, panniers, and backpacks. Pure oxygen, aeration, quality water and cold temperature are maintained throughout the trip. This last step, while the shortest, can have an immense

Washoe Park Trout Hatchery
Angela Smith, Hatchery Manager

While the fish that we raise at the Washoe Park Trout Hatchery do not hatch in the wild, everything we do in our daily work ensures that once fish enter the wild environment, they have the best opportunity for survival. The ability for our fish to thrive in a wild environment is enhanced in many ways while under our care. The first step includes maintaining fin quality, fish condition and vigor, and proper genetics. From the time we spawn our fish in the spring, everything we do is centered around fish quality. The cleanliness of our spawning and incubation equipment reduces the chance of disease outbreaks. Proper spawning techniques and brood management maintain the genetic integrity of the progeny, reduces domestication, and helps our stock retain the wild traits that will help them survive in the wild. Reducing stress in our rearing units by using covers, correct fish densities and adequate water flow help provide fish with an environment in which they can thrive until they are released.
effect on how well the fish survive in their new home. If the fish are stressed and struggling during the trip, their chances of survival are reduced dramatically.

Improved opportunity for survival in the wild after release from the hatchery is accomplished through working closely with biologists. Stocking sizes, rates, frequencies, and locations are based on the annual sampling the biologists conduct. This information is critical to putting the best quality fish in the correct environment, so they have the best chance for success. Our biologist’s knowledge of the water quality, predator population structure and food availability in the lakes they are responsible for is crucial to developing a stocking plan for a body of water.

These are just a few of the ways in which the Washoe Park Trout Hatchery improves the chance of success for the fish we stock into the wild. The same work and knowledge go into every fish we raise, whether it is destined for a recovery project in the Scapegoat Wilderness, a kid’s fishing pond in Kalispell, a high mountain lake or a large lake or reservoir. Our fish are healthy and ready to survive and thrive in the wild!
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**2022**

**Jocko River Trout Hatchery**  
*Jeff Lammerding, Hatchery Manager*

In team sports, everybody has a role to play. Baseball has its catchers, pitchers, and center fielders. Football has its quarterbacks, linemen, and receivers. All very distinct and specialized roles to perform. As professionals, when these role players know their positions and perform them to the best of their abilities, championships can be won.

After the State of Montana bought the Jocko River Trout Hatchery in 1948, many rivers and streams were planted out of the Arlee hatchery. In 1955 when Montana Fish and Game wanted a very catchable fish that got big, got big fast, the Arlee strain of rainbow trout was developed. A quick search of FWP’s online stocking records will show the first non-reservoir plant out of the Arlee hatchery was Butte Cabin Creek in Granite County in 1944 when it was still a privately-owned hatchery. For decades after officially becoming a state facility, Jocko River planted rivers and streams. Flathead, Bitterroot, Big Hole, and Blackfoot rivers are just a few. Rock, Cherry, Monture, Spring, and Post creeks were among stocked streams in the hatchery's first five years. According to online records, in 1982 the Thompson and Fisher rivers were the last streams stocked with Arlee rainbows.

Early on in its history, Jocko planted rainbow trout in streams, rivers, lakes and reservoirs. More recently, wild fish populations and their management have come front and center for FWP. Since the 1980s, Jocko has specialized its role to planting ponds and reservoirs, most with little to no spawning habitat, many in urban areas and several with fishing piers to provide easier access to the water. These plants provide fishing opportunities for all.

If you are out fishing one of Montana's many rivers or streams with wild, native, self-sustaining populations, you might consider releasing them for the next person. If you want to take a few home for dinner, or get a kid hooked on fishing, try one of the many ponds planted with Montana's premiere put-and-take fish, the Arlee rainbow trout.

The professionals at the Jocko River Trout Hatchery produce the best fish to meet the needs for lakes large and small all over Montana. The Arlee rainbow is just one role-player in Montana's championship-caliber angling.
INTRODUCING THE NEW MONTANA MYFWP MOBILE APP

Montana hunting and fishing licenses are now accessible through a secure and convenient mobile app.

The Montana MyFWP app provides a digital wallet to store and display licenses and digital carcass tags, known as E-Tags, that can validate your harvest in the field.

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Download on the App Store

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FPW.MT.GOV/MYFWPAPP
<table>
<thead>
<tr>
<th>FISH</th>
<th>MONTANA NATIVE</th>
<th>LENGTH (inches)</th>
<th>WEIGHT</th>
<th>GIRTH (inches)</th>
<th>SITE</th>
<th>ANGLER</th>
<th>BAIT TACKLE</th>
<th>DATE</th>
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<tbody>
<tr>
<td>Arctic Grayling</td>
<td>■</td>
<td>20</td>
<td>3.63 lbs.</td>
<td>11.7</td>
<td>Washtub Lake</td>
<td>Glenn Owens</td>
<td>Wet Fly</td>
<td>6/28/03</td>
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<td>Bigmouth Buffalo</td>
<td>■</td>
<td>40.7</td>
<td>57.75 lbs.</td>
<td>32.5</td>
<td>Nelson Reservoir</td>
<td>Craig D. Grassel</td>
<td>Bow &amp; Arrow</td>
<td>6/4/94</td>
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<tr>
<td>Black Bullhead</td>
<td></td>
<td>14.37</td>
<td>2.60 lbs.</td>
<td>11.5</td>
<td>Smiley Slough</td>
<td>Birrell White</td>
<td>Bait</td>
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<tr>
<td>Black Crappie</td>
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<td>16.7</td>
<td>3.13 lbs.</td>
<td></td>
<td>Tongue River Reservoir</td>
<td>Al Elser</td>
<td></td>
<td>1973</td>
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<tr>
<td>Bluegill</td>
<td></td>
<td>11</td>
<td>2.64 lbs.</td>
<td>17</td>
<td>Peterson's Stock Dam</td>
<td>Brent Fiadmo</td>
<td>Worm</td>
<td>6/3/83</td>
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<td>Blue Sucker</td>
<td>■</td>
<td>34.5625</td>
<td>13.29 lbs.</td>
<td>18.1875</td>
<td>Marias River</td>
<td>Jason Karls</td>
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<td>4/19/19</td>
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<td>Brook Trout</td>
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<td>9.06</td>
<td>0.6 lbs.</td>
<td></td>
<td>Lower Two Medicine Lake</td>
<td>John R. Cook</td>
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<td>Brown Trout</td>
<td></td>
<td>37</td>
<td>32.4 lbs.</td>
<td>28</td>
<td>Marias River</td>
<td>Robbie Dockter</td>
<td></td>
<td>3/3/21</td>
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<td>Bull Trout (Dolly Varden)</td>
<td>■</td>
<td>37</td>
<td>25.63 lbs.</td>
<td>25</td>
<td>Marias River</td>
<td>James Hyer</td>
<td>Trolling Line</td>
<td>1916</td>
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<tr>
<td>Burbot</td>
<td>■</td>
<td>39</td>
<td>17.08 lbs.</td>
<td>16.25</td>
<td>Missouri River Wolf Point</td>
<td>Jeff Eugene Iwen</td>
<td>Minnow</td>
<td>4/18/89</td>
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<tr>
<td>Channel Catfish</td>
<td>■</td>
<td>38.25</td>
<td>35.18 lbs.</td>
<td>27</td>
<td>Colstrip Surge Pond</td>
<td>John D. Smith</td>
<td>Beetle Spin w/ Mr. Twister</td>
<td>7/7/19</td>
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<td>Chinook Salmon</td>
<td></td>
<td>38.125</td>
<td>32.05 lbs.</td>
<td>26.50</td>
<td>Fort Peck Reservoir Face of Dam</td>
<td>Greg Haug</td>
<td>Squid &amp; Flasher</td>
<td>8/16/20</td>
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<tr>
<td>Cisco</td>
<td></td>
<td>18.2</td>
<td>2.08 lbs.</td>
<td></td>
<td>Missouri River</td>
<td>Troy Holstein</td>
<td>Jig &amp; Minnow</td>
<td>6/2/14</td>
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<td>Creek Chub</td>
<td>■</td>
<td>11.0</td>
<td>0.52 lbs.</td>
<td></td>
<td>Harbaugh Bass Pond</td>
<td>William Bibeau</td>
<td>Worm</td>
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<td>Coho Salmon</td>
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<td>25.5</td>
<td>4.88 lbs.</td>
<td></td>
<td>Fort Peck Reservoir Face of Dam</td>
<td>Irven F. Stohl</td>
<td>Daredevil</td>
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<td>Common Carp</td>
<td></td>
<td>38</td>
<td>40.2 lbs.</td>
<td>30.5</td>
<td>Nelson Reservoir</td>
<td>Jared S. Albus</td>
<td>Bow &amp; Arrow</td>
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<td>Cutthroat Trout</td>
<td>■</td>
<td>16</td>
<td>0.6 lbs.</td>
<td></td>
<td>Red Eagle Lake</td>
<td>Wm. D. Sands</td>
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<td>Emerald Shiner</td>
<td></td>
<td>3.43</td>
<td>0.01 lbs.</td>
<td></td>
<td>Park Grove Bridge</td>
<td>Ike Braaten</td>
<td>Rapala</td>
<td>6/9/06</td>
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<tr>
<td>Flathead Chub</td>
<td>■</td>
<td>11.2</td>
<td>0.59 lbs.</td>
<td></td>
<td>Thornton Pond</td>
<td>Douglas Jordan</td>
<td>Worm</td>
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<td>Freshwater Drum</td>
<td>■</td>
<td>29.5</td>
<td>21.59 lbs.</td>
<td>26.5</td>
<td>Fort Peck – Ghost Coulee</td>
<td>Matt Washut</td>
<td>Smelt</td>
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<td>Golden Trout</td>
<td></td>
<td>23.5</td>
<td>5.43 lbs.</td>
<td>13</td>
<td>Cave Lake</td>
<td>Mike Malixi</td>
<td>Lure</td>
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<td>Goldeye</td>
<td>■</td>
<td>3.18</td>
<td>0.84 lbs.</td>
<td>9.87</td>
<td>Nelson Reservoir</td>
<td>Don Nevrvy</td>
<td>Jig/Power Crawler</td>
<td>7/4/00</td>
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<td>Green Sunfish</td>
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<td>9.0</td>
<td>0.84 lbs.</td>
<td>9.87</td>
<td>Hickson’s Pond</td>
<td>Bette Schmieding</td>
<td>Worm</td>
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<td>Kokanee Salmon</td>
<td></td>
<td>26.8</td>
<td>7.85 lbs.</td>
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<td>Hauser Lake</td>
<td>John Bomar</td>
<td>Jig</td>
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<td>Lake Chub</td>
<td>■</td>
<td>5.9</td>
<td>0.075 lbs.</td>
<td>3.4</td>
<td>Corner Lake</td>
<td>James Cashell</td>
<td>Artificial Fly</td>
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<td>Lake Trout</td>
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<td>42.5</td>
<td>42.69 lbs.</td>
<td>31.5</td>
<td>Flathead Lake</td>
<td>Ruth Barber</td>
<td>Flatfish</td>
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<td>Lake Whitefish</td>
<td></td>
<td>27</td>
<td>10.46 lbs.</td>
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<td>Flathead Lake</td>
<td>Swan McDonald V</td>
<td>Jig</td>
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<td>Largemouth Bass</td>
<td></td>
<td>22.5</td>
<td>9.58 lbs.</td>
<td>18.9</td>
<td>Lake Elmo</td>
<td>Brandon Wright</td>
<td>Worm</td>
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<td>Largescale Sucker</td>
<td>■</td>
<td>23.1</td>
<td>6.16 lbs.</td>
<td>14.8</td>
<td>Woodland Pond</td>
<td>Kevin Fraley</td>
<td>Worm</td>
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<td>Longnose Sucker</td>
<td>■</td>
<td>19.5</td>
<td>4.21 lbs.</td>
<td>12.4</td>
<td>Holter Lake</td>
<td>Austin Wargo</td>
<td>Jig</td>
<td>5/14/21</td>
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<td>Mottled Sculpin</td>
<td>■</td>
<td>0.05</td>
<td>lbs.</td>
<td></td>
<td>Belt Creek (North of Neihart MT)</td>
<td>Brad Sullivan</td>
<td>Worm</td>
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<td>Mountain Sucker</td>
<td>■</td>
<td>6.2</td>
<td>1.60 oz.</td>
<td></td>
<td>Beaver Creek Reservoir</td>
<td>Robert Garwood</td>
<td>Worm</td>
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<td>Mountain Whitefish</td>
<td>■</td>
<td>23</td>
<td>5.11 lbs.</td>
<td>12.5</td>
<td>Hauser Reservoir</td>
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<td>Rapala</td>
<td>10/10/07</td>
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<td>FISH</td>
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<td>LENGTH (inches)</td>
<td>WEIGHT</td>
<td>GIRTH (inches)</td>
<td>SITE</td>
<td>ANGLER</td>
<td>BAIT TACKLE</td>
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<td>Northern Pikeminnow</td>
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<td>27.125</td>
<td>7.88 lbs.</td>
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<td>Noxon Rapids Reservoir</td>
<td>Darrel Torgimson</td>
<td>Lure</td>
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<tr>
<td>Northern Pike</td>
<td></td>
<td>37.5 lbs.</td>
<td></td>
<td></td>
<td>Tongue River Reservoir</td>
<td>Lance Moyer</td>
<td></td>
<td>1972</td>
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<td>Paddlefish</td>
<td></td>
<td>77</td>
<td>142.5 lbs.</td>
<td>41.75</td>
<td>Missouri River Near Kipp Park</td>
<td>Larry Branstetter</td>
<td>Snagged</td>
<td>5/20/73</td>
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<tr>
<td>Pallid Sturgeon</td>
<td></td>
<td>60 lbs.</td>
<td>27.5</td>
<td></td>
<td>Yellowstone River Near Sidney</td>
<td>Gene Sattler</td>
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<td>5/13/79</td>
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<tr>
<td>Peamouth</td>
<td></td>
<td>16.125</td>
<td>1.52 lbs.</td>
<td></td>
<td>Clark Fork River</td>
<td>Mike Jensen</td>
<td>Artificial Fly</td>
<td>7/29/07</td>
</tr>
<tr>
<td>Pumpkinseed</td>
<td></td>
<td>9.5</td>
<td>0.96 lbs.</td>
<td></td>
<td>Upper Thompson Lake</td>
<td>Nathan Bache</td>
<td>Lure</td>
<td>7/30/06</td>
</tr>
<tr>
<td>Pygmy Whitefish</td>
<td></td>
<td>9.84</td>
<td>0.36 lbs.</td>
<td>6.3</td>
<td>Little Bitterroot Lake</td>
<td>Richard Geldrich</td>
<td>Maggot</td>
<td>2/13/10</td>
</tr>
<tr>
<td>Rainbow Smelt</td>
<td></td>
<td>7.1</td>
<td>0.08 lbs.</td>
<td></td>
<td>Fort Peck Dredge Cuts</td>
<td>Nathan Cooper</td>
<td>Jigging Spoon</td>
<td>2/18/20</td>
</tr>
<tr>
<td>Rainbow Trout</td>
<td></td>
<td>38.62</td>
<td>33.1 lbs.</td>
<td>27</td>
<td>Kootenai River David Thompson Bridg</td>
<td>Jack G. Housel, Jr.</td>
<td>Lure</td>
<td>8/11/97</td>
</tr>
<tr>
<td>Rainbow-Cutthroat Hybrid Trout</td>
<td></td>
<td>35.75</td>
<td>30.25 lbs.</td>
<td>27.5</td>
<td>Ashley Lake</td>
<td>Pat Kelley</td>
<td>Bait</td>
<td>5/16/82</td>
</tr>
<tr>
<td>Redside Shiner</td>
<td></td>
<td>6.5</td>
<td>0.10 lbs.</td>
<td>3.75</td>
<td>Lost Lake</td>
<td>Josh Ahles</td>
<td>Worm</td>
<td>8/21/01</td>
</tr>
<tr>
<td>River Carpsucker</td>
<td></td>
<td>24</td>
<td>6.95 lbs.</td>
<td>16.5</td>
<td>Fort Peck Reservoir</td>
<td>Brady Miller</td>
<td>Bow &amp; Arrow</td>
<td>8/15/08</td>
</tr>
<tr>
<td>Rock Bass</td>
<td></td>
<td>10.8</td>
<td>1.31 lbs.</td>
<td></td>
<td>Lower Crazy Head Springs Pond</td>
<td>Karson Campbell</td>
<td>Nightcrawler</td>
<td>4/26/14</td>
</tr>
<tr>
<td>Sauger</td>
<td></td>
<td>28.2</td>
<td>8.805 lbs.</td>
<td>15.1</td>
<td>Fort Peck Reservoir</td>
<td>Gene Moore</td>
<td>Whistler/Minnow</td>
<td>12/12/94</td>
</tr>
<tr>
<td>Saugeye</td>
<td></td>
<td></td>
<td>15.66 lbs.</td>
<td></td>
<td>Fort Peck Reservoir Squaw Creek</td>
<td>Myron Kibler</td>
<td>Minnow</td>
<td>1/11/95</td>
</tr>
<tr>
<td>Shorthead Redhorse</td>
<td></td>
<td>20.25</td>
<td>4.68 lbs.</td>
<td></td>
<td>Marias River Near Loma</td>
<td>Ray Quigley</td>
<td>Worm</td>
<td>4/14/85</td>
</tr>
<tr>
<td>Shortnose Gar</td>
<td></td>
<td>35</td>
<td>7.41 lbs.</td>
<td></td>
<td>Fort Peck Dredge Cuts</td>
<td>Brandon Hansard</td>
<td>Bow and Arrow</td>
<td>5/16/13</td>
</tr>
<tr>
<td>Shovelnose Sturgeon</td>
<td></td>
<td>39.75</td>
<td>14.125 lbs.</td>
<td></td>
<td>Missouri River</td>
<td>Chad Buck</td>
<td>Nightcrawler</td>
<td>5/21/10</td>
</tr>
<tr>
<td>Smallmouth Bass</td>
<td></td>
<td>22</td>
<td>7.84 lbs.</td>
<td>17.75</td>
<td>Fort Peck Reservoir</td>
<td>Theron Thompson</td>
<td>Jig &amp; Minnow</td>
<td>10/3/20</td>
</tr>
<tr>
<td>Smallmouth Buffalo</td>
<td></td>
<td>38</td>
<td>38 lbs.</td>
<td>29.25</td>
<td>Nelson Reservoir</td>
<td>Brady Miller</td>
<td>Bow &amp; Arrow</td>
<td>4/28/07</td>
</tr>
<tr>
<td>Spottail Shiner</td>
<td></td>
<td>3.0</td>
<td>0.02 lbs.</td>
<td></td>
<td>Tiber Reservoir</td>
<td>Joe Hagengruber</td>
<td>Worm</td>
<td>8/14/10</td>
</tr>
<tr>
<td>Stonecat</td>
<td></td>
<td>10</td>
<td>0.54 lbs.</td>
<td></td>
<td>Milk River</td>
<td>Dale Bjerga</td>
<td>Worm</td>
<td>6/16/96</td>
</tr>
<tr>
<td>Tiger Muskellunge</td>
<td></td>
<td>50</td>
<td>38.75 lbs.</td>
<td></td>
<td>Deadmans Basin Reservoir</td>
<td>Leo Cantin</td>
<td>Bait</td>
<td>9/2/12</td>
</tr>
<tr>
<td>Tiger Trout</td>
<td></td>
<td>20.6</td>
<td>4.04 lbs.</td>
<td>12</td>
<td>Bear Lake</td>
<td>Joe Sobczak</td>
<td>Wooley Bugger</td>
<td>2/9/97</td>
</tr>
<tr>
<td>Utah Chub</td>
<td></td>
<td></td>
<td>1.81 lbs.</td>
<td></td>
<td>Canyon Ferry Reservoir</td>
<td>Eugene Bastian</td>
<td>Rat Fink/ Maggots</td>
<td>2/5/92</td>
</tr>
<tr>
<td>Walleye</td>
<td></td>
<td>32.25</td>
<td>18.02 lbs.</td>
<td>22</td>
<td>Holter Lake</td>
<td>Trevor Johnson</td>
<td>Kit's Tackle</td>
<td>5/10/21</td>
</tr>
<tr>
<td>White Bass</td>
<td></td>
<td>17</td>
<td>2.80 lbs.</td>
<td>12</td>
<td>Missouri River South of Bainville</td>
<td>Vernon Pacovsky</td>
<td>Minnow</td>
<td>10/13/07</td>
</tr>
<tr>
<td>White Crappie</td>
<td></td>
<td>18.5</td>
<td>3.68 lbs.</td>
<td></td>
<td>Tongue River</td>
<td>Gene Bassett</td>
<td>Worm</td>
<td>5/10/96</td>
</tr>
<tr>
<td>White Sturgeon</td>
<td></td>
<td>75</td>
<td>96 lbs.</td>
<td></td>
<td>Kootenai River</td>
<td>Herb Stout</td>
<td></td>
<td>1968</td>
</tr>
<tr>
<td>White Sucker</td>
<td></td>
<td>21.625</td>
<td>5.33 lbs.</td>
<td>12.75</td>
<td>Nelson Reservoir</td>
<td>Fred Perry</td>
<td>Spear</td>
<td>2/10/83</td>
</tr>
<tr>
<td>Yellow Bullhead</td>
<td></td>
<td>15.5</td>
<td>1.91 lbs.</td>
<td>10</td>
<td>Tongue River Reservoir</td>
<td>Roberta Legge</td>
<td>Minnow</td>
<td>12/17/20</td>
</tr>
<tr>
<td>Yellow Perch</td>
<td></td>
<td>14.375</td>
<td>2.39 lbs.</td>
<td>12.1875</td>
<td>Lower Stillwater Lake</td>
<td>Josh Emmert</td>
<td>Jig</td>
<td>2/19/06</td>
</tr>
</tbody>
</table>