

Montana Fish and Wildlife Conservation Office



BILLINGS–BOZEMAN–GREAT FALLS–LEWISTOWN, MT
AND MOUNTAIN HOME, ID

Summer 2017

Habitat Restoration:

Loosely defined, habitat restoration is the process of reverting degraded habitat back to its original pre-altered condition, or very nearly so. Most of our native trout in Montana are affected to some degree by past human activities. Working with our conservation partners (Trout Unlimited, Montana Fish Wildlife and Parks, U. S. Forest Service, Lower Clark Fork Watershed Group, Avista Corporation, and others) we successfully completed several projects in western Montana that will ultimately benefit Westslope Cutthroat Trout and the federally threatened Bull Trout.

MINER'S GULCH, LOWER CLARK FORK RIVER DRAINAGE

Miners Gulch, was subject to placer mining and timber harvest. These activities have resulted in altered stream flows, decreased channel stability, and reduced fish habitat. Historically, this reach of the Vermilion River was of importance to native Bull Trout and Westslope Cutthroat Trout. Prior to this project this reach was unstable and provided limited habitat. Today, the reach has been restored with funding assistance provided by the Western Native Trout Initiative.



Left: A section of the Miner's Gulch Reach of the Vermilion River pictured prior to channel reconstruction.

Right: Miner's Gulch Reach of the Vermilion River following reconstruction efforts. Root-wads and strategically placed boulders were used to restore the channel and maintain pool and riffle habitat

Photo: Brita Olson, Lower Clark Fork Watershed Group.

Habitat Restoration continued:

WARM SPRINGS CREEK, UPPER CLARK FORK RIVER DRAINAGE

Warm Springs Creek is a priority-one stream for Bull Trout recovery and one of the largest headwater tributaries in the Upper Clark Fork watershed— draining a 250 square-kilometer (100 square-mile) basin including 190 kilometer (km; 118 miles [mi]) of stream channel. The Warm Springs Creek watershed contains Westslope Cutthroat trout and the furthest upstream population of Bull Trout in the Clark Fork watershed. Warm Springs Creek also represents one of the best opportunities in the Upper Clark Fork to sustain a bull trout metapopulation by implementing a relatively small number of strategic projects that would restore connectivity among a large network of stream habitats. The following projects received funding assistance from the U.S. Fish and Wildlife Service (USFWS) National Fish Passage Program.



Top Left: A culvert on Forest Service Road 78414. Minimally or undersized culverts often become migratory barriers for fish. This culvert is partially perched and pictured prior to channel reconstruction. The road was decommissioned and the culvert was removed.



Top Right: Image post-culvert removal and stream restoration efforts through former road and culvert site, downstream looking up.



Bottom: Image post-culvert removal and stream restoration efforts through former road and culvert site, upstream looking down.

Photo: Casey Hackathorn, Trout Unlimited

Habitat Restoration:

WARM SPRINGS CREEK, UPPER CLARK FORK RIVER DRAINAGE. (Continued)



Top Left: Undersized culverts on Forest Service Road 8456 create a migratory barrier for Westslope Cutthroat Trout and Bull Trout in the East Fork of Warm Springs Creek.

Right: The culverts were removed and replaced with an oversized arch within which the stream bed was recreated. This approach provides passage for fish and other aquatic organisms.

Bottom Left: Final project provides improved passage for aquatic organisms both upstream and down, as well as for humans crossing the stream.

Photo: Casey Hackathorn, Trout Unlimited

WARM SPRINGS CREEK, UPPER CLARK FORK RIVER DRAINAGE. (Continued)



Left: Undersized culvert on Forest Service Road 8456 creates a migratory barrier for Westslope Cutthroat Trout and Bull Trout in the Middle Fork of Warm Springs Creek.

Right: The culvert was removed and replaced with an oversized arch within which the stream bed was recreated. This approach provides passage for fish and other aquatic organisms.

Photo: Casey Hackathorn, Trout Unlimited



Top Left: Even large culverts can affect passage and alter natural stream characteristics. This culvert on the main-stem of Warm Springs Creek posed issues with water velocity during high flows and depth issues during lower flows.

Right (top and bottom): The culvert was removed and a bridge was used as a replacement. This approach provides passage for fish and other aquatic organisms and allows the stream to function more naturally.

Photo: Casey Hackathorn, Trout Unlimited



Canyon Creek Aquatic Organism Passage project, Bighorn National Forest, Wyoming.

Canyon Creek has been identified as a range enhancement opportunity stream for Yellowstone Cutthroat Trout within in the Bighorn-Wind Geographic Management Unit. The following project received funding assistance from the USFWS National Fish Passage Program and supports native trout conservation efforts as well as improving recreational fishing opportunities on public lands.



Top Left: Original perched culverts on Forest Road 25 have altered stream morphology and function as a barrier to migrating aquatic species. *Photo: Chris Williams, US Forest Service*

Top Right: One culvert removed and the stream re-routed through a constructed and lined channel to minimize erosion and sediment during construction. The stream re-route was necessary to remove the second culvert. *Photo: George Jordan, US Fish and Wildlife Service*

Bottom Left: Bottomless arch being built over a series of “step-pools”. The steel arch provides support for human passage and the reconstructed stream bed provides passage for aquatic organisms. *Photo: Chris Williams, US Forest Service*

Bottom Right: Checking post construction stream grade to ensure project is built to as designed specification. *Photo: Chris Williams, US Forest Service*

Tribal Technical Assistance:

Blackfeet Tribal Sport Fishery Management: MTFWCO staff conducted annual gill-netting surveys on Four Horns, Kipp, Hope, and Duck Lake on the Blackfeet Reservation in North Central Montana. The Blackfeet Tribe continues to have excellent angling opportunities for trophy Rainbow Trout, Walleye, Brown Trout, and Westslope Cutthroat Trout in many of its 17 lakes stocked by Creston National Fish Hatchery. We have been working closely with the Blackfeet Fish and Wildlife Department (BFWD) to further understand and maintain quality sport fisheries in these renowned lakes. We will be continuing collaborative efforts to monitor and improve Blackfeet sport fisheries.

Four Horns continues to be one the better Walleye and Rainbow Trout fisheries throughout Montana. Walleye were introduced by MTFWCO in 1986 and have become well established and provide excellent angling opportunities for trophy-class Walleye. In 2017, the average size Walleye captured in gill-nets was 2.5 kilograms (kg; 5.5 pounds [lbs]) and several Walleye over 4.9 kg (11 lbs) were captured. Rainbow trout in Four Horn are also some of the largest in Montana. The average Rainbow captured was 52 centimeters (cm; 20.5 inch [in]) and 2.1 kg (4.75 lbs) and the largest Rainbow captured was 66 cm (26 in) and 4.3 kg (9.4 lbs) Future efforts will be made to develop growth and survival models for Four Horns Rainbow Trout to capture any potential population trends. Also, pending congressional funding for the Blackfeet Water Compact, Four Horns will to be augmented in size and acquiring baseline data was a priority in 2017.



Maintaining a quality recreational fishery requires periodic sampling. Sampling data give biologists a “snap shot” of the condition of a fish population in a body of water. This is a representation of the quality fishery available on many Blackfeet Nation waters.

Photo: Andrew Gilham, US Fish and Wildlife Service

Kipp Lake:

Kipp Lake was netted in 2016 and 2017 to address concerns with a decline in Rainbow Trout size. MTFWCO has identified two possible factors that are contributing to the decline in size structure, competition with White Suckers and decreased water levels. Netting data revealed a significant increase in catch per unit effort of White Suckers in from 2010 to 2017, which also coincided with a decline in lake depth. White Sucker suppression and water level management were implemented by BFWD from 2008-2010, which appeared to have substantial benefits on Rainbow Trout growth. MTFWCO will be working closely with BFWD to implement these management actions this year and hopefully help BFWD restore Kipp Lake to a viable trophy Rainbow Trout fishery.

Tribal Technical Assistance (continued):

Duck Lake:

Duck Lake was also netted in 2016 and 2017 to address concerns with an apparent decline in Rainbow Trout size and condition. Duck Lake is one of the most renowned Rainbow Trout fisheries in Montana, but anglers have recently expressed concern over the lack of large Rainbow Trout. MTFWCO and BFWD have been working closely to address these concerns and test limiting factors.

Currently, there have been three hypotheses proposed for the decline in Rainbow Trout size; competition with White Suckers, habitat and water quality degradation, and poor growth and survival of Eagle Lake strain Rainbow Trout. Because introducing a different strain of salmonid was the most cost-effective variable to manipulate, it was agreed that testing the viability of Eagle Lake Rainbow Trout would be the

first hypothesis test. In 2017, Creston National Fish Hatchery split annual fish stocking between Eagle Lake Rainbow Trout and M012 Westslope Cutthroat Trout. Over the next 3-5 years, growth and survival of each species will be analyzed to determine if the apparent decline in Rainbow Trout can be attributed to hatchery strain.



In an effort to enlist the help of anglers to provide data, a series of voluntary harvest reporting stations were established that state the following:

Attention Anglers: Blackfeet Fish and Wildlife and the U.S. Fish and Wildlife Service are conducting a study to address concerns with growth and survival of Rainbow Trout in Duck Lake.

Growth and survival will be compared between Westslope Cutthroat and Rainbow Trout.

To help us further understand survival rates between species and improve the quality of fishing in Duck Lake, we would greatly appreciate all anglers fill out a catch card provided at this station and leave completed catch cards in the box below.

Photo: Andrew Gilham, US Fish and Wildlife Service

Hope Lake:

At the request of BFWD, Hope Lake was netted to determine the status of introduced Northern Pike. Pike were introduced in 2009 to provide an alternative to Rainbow Trout on the Eastern portion of the Blackfeet Reservation. However, anglers have raised concerns about low angling success and have expressed interest in returning Hope to a Rainbow Trout fishery. Netting the lake revealed that pike have overtaken White Suckers as the most abundant species in Hope, although, overall density of pike was low. Moreover, because Pike have apparently depleted the forage base in the lake, it remains unclear if pike are a sustainable recreational angling species in Hope Lake. MTFWCO has advised BFWD to draw down Hope Lake next fall, and if netting in 2019 indicates pike were eradicated, restore the lake to a Rainbow Trout fishery.

Blackfeet Stream Surveys;

MTFWCO assisted the Blackfeet Environmental Office (BEO) with annual stream surveys that monitor fish species distributions, instream and riparian habitat quality, water quality, and aquatic insect diversity. This year, 15 sites were surveyed in the Milk River Watershed.

MTFWCO has been assisting with these surveys since 1993. MTFWCO hopes to collaborate with BFWD, BEO and the Bureau of Indian Affairs (BIA) to develop a GIS-based interactive fish species distribution map for the Blackfeet Reservation. Additionally, these surveys have proven to be invaluable in the assessment of imperiled minnow species throughout Montana. In 2016, MTFWCO collaborated with Montana State University to help assess the status of Northern Red Belly Dace and Pearl Dace in Montana. Stream surveys in 2016, revealed possibly the last viable population of Pearl Dace throughout Montana in a tributary to the St. Mary River. Fortunately, in 2017, we found an additional viable population of Pearl Dace in the

Middle Fork of Milk River. Additionally, there are at least 5 viable populations of Northern Red Belly Dace on the Blackfeet Reservation.



While small and often overlooked by many, native minnows are an important part of the ecosystem and their presence shed insights into stream health. Documenting viable populations of Pearl Dace and Northern Red Belly Dace on the Blackfeet Reservation was a significant finding.

Photo: Andrew Gilham, US Fish and Wildlife Service

Blackfeet AIS Sampling:

MTFWCO staff conducted surveys to test popular sport fishery lakes for the presence of aquatic invasive species (AIS). In 2016, two Montana Lakes tested positive for presence of Quagga Mussels. One of those lakes was in close proximity to the Blackfeet Reservation. Therefore, BFWD, requested assistance with sampling for AIS in a few of the most popular recreational lakes in 2017. With support from the US Fish and Wildlife Service's AIS program, MTFWCO conducted plankton tows and shoreline sampling in Duck, Four Horns, Mission and Lower St. Mary lakes in the spring and fall of 2017. This effort was part of a larger collaboration between MTFWCO, Bureau of Indian Affairs, BFWD and the Flathead Basin Commission to stem the spread of AIS to Blackfeet Lakes. Additionally, BFWD implemented mandatory boat check stations in 4 locations on the reservation. Although, results from this fall have not been received, spring sampling did not detect the presence of AIS. Of note: a BFWD check station intercepted a watercraft, originally purchased in Michigan that contained Quagga Mussels. Hopefully, efforts to keep AIS from spreading to Blackfeet lakes will continue to be successful.

St. Mary Bull Trout

Like most inland salmonids, Bull Trout have been broadly characterized into two distinct life-history forms – non-migratory (resident) and migratory. Resident Bull Trout are smaller and spend their entire lives within small tributaries where they rear as juveniles and spawn as adults, whereas migratory forms move into the small tributary streams to spawn, but migrate back downstream to larger, more productive river (fluvial) or lake (adfluvial) habitats to forage and over-winter.



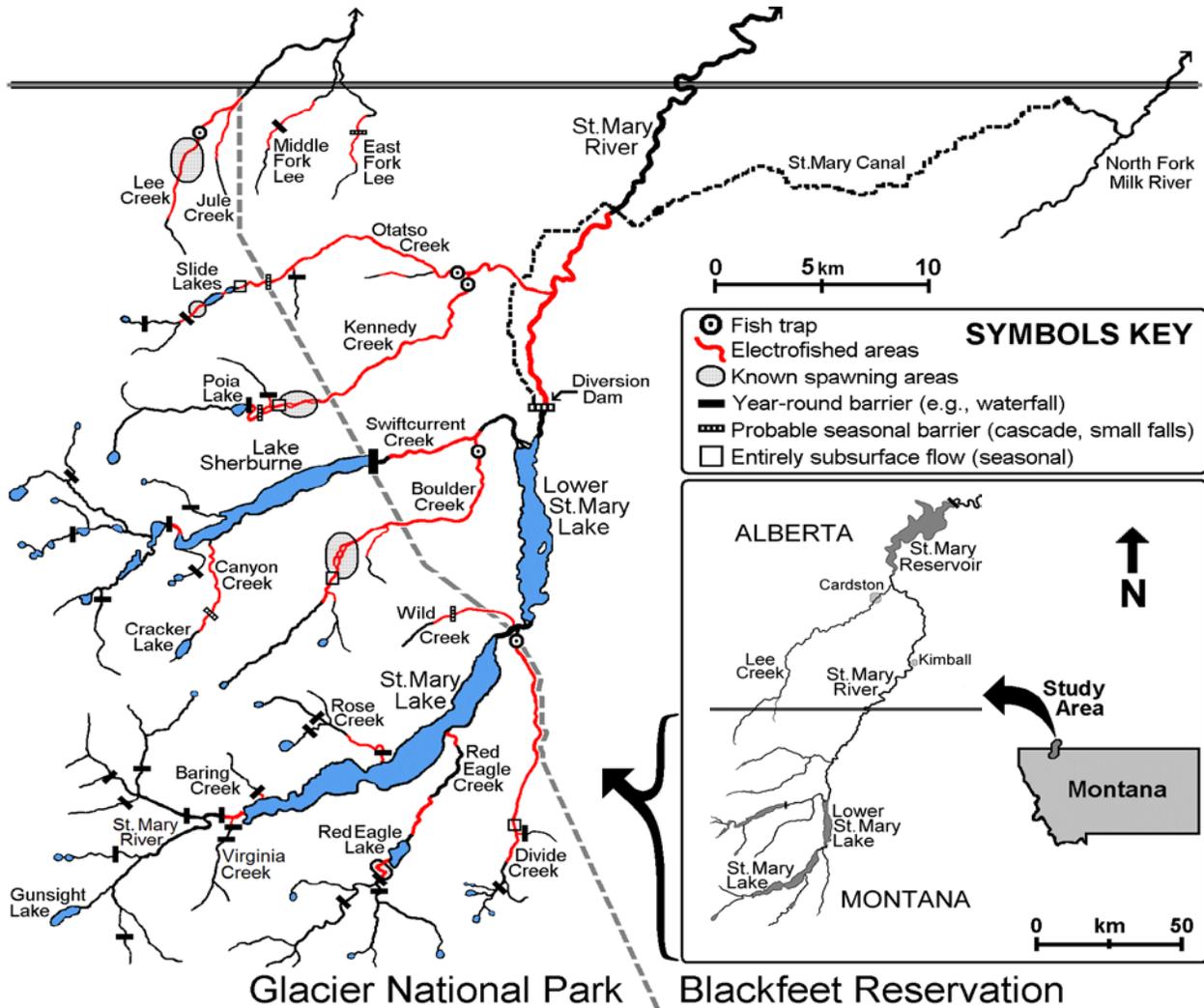
Similar-aged adult Bull Trout – St. Mary River drainage, MT
Top fish is migratory, bottom fish is resident.

Photo: USFWS/Jim Mogen

While both resident and migratory Bull Trout still exist within the St. Mary Drainage, it is the larger migratory form that is most affected by anthropogenic activities, whereas many of the smaller bodied resident populations are distributed in the headwaters and, fortunately, are protected within the boundaries of Glacier National Park. Although we continue to monitor these important resident populations, the primary focus of our investigations has been on the larger migratory fish that reside downstream in St. Mary and Lower St. Mary lakes and the St. Mary River itself, including the 45 km of habitable river downstream in Alberta.

Each summer large migratory adults travel great distances (up to 90 km; 55 mi documented in this system) to spawn in the clean cold gravel riffles of their natal streams. Once there, they often wait weeks or more for optimum stream flow and temperature conditions before commencing the spawn. Shortly afterwards, the large migrants exit the stream and return to larger over-wintering habitats downstream. Although this movement into smaller streams provides a convenient and consistent means of collecting data on these fish, the upstream spawning run and, equally-important, return trip exposes much of the migratory population to a number of potential threats, most importantly, those associated with the U.S. Bureau of Reclamation's (USBR) Milk River Irrigation Project.

St. Mary Bull Trout (continued)



St. Mary River drainage, Montana and Alberta

Between 1906 and 1924, the USBR built several water-control and delivery structures in the St. Mary River drainage as part of the Milk River Irrigation Project. Among those structures was the 2-m-high concrete St. Mary River Diversion Dam located just downstream from Lower St. Mary Lake. Annually between about April through September, the dam diverts approximately ~18.4 cubic-meters per second (m^3/s ; 650 cubic feet per seconds[cfs]) into the St. Mary Canal, a reduction of more than 80 percent of the typical late summer instream flow.

The canal conveys the water about 50 km (31 mi) through a series of canals, siphons and drop structures over the Hudson Bay Divide to the North Fork Milk River of the Missouri River basin. Also constructed during this period was the 33 meter (m; 108 feet) high Sherburne Dam which impounded Swiftcurrent Creek 10 km (6.2 mi) upstream from its mouth and formed Lake Sherburne (reservoir). Finally, Swiftcurrent Creek, which formerly flowed into the St. Mary

St. Mary Bull Trout (continued)

River downstream from Lower St. Mary Lake, was diverted into the lake itself, which allowed water released from Lake Sherburne to be diverted into the St. Mary Canal at the foot of Lower St. Mary Lake.

Reservoir operations often result in water depths that range between full and nearly empty within a single year and tail-water outflow that typically ranges from 2.8-16.9 m³/s (100-600 cfs) during the irrigation season but is suddenly reduced to no flow during the winter months.

As a result of USBR activities, Bull Trout and other native fishes inhabiting the mainstem St. Mary River have faced a gauntlet of unnatural threats over the past century, including entrainment and passage issues, reduced water quality and severely altered flow regimes. Remarkably, our long-term (1997-present) research and monitoring which has included annual electrofishing surveys, fish trapping, radio telemetry, canal entrainment sampling, redd surveys and an extensive, ongoing, PIT (Passive Integrated Transponder)-tag-based, mark/recap movement study indicate that Bull Trout continue to persist in the St. Mary drainage.

Resident and migratory (fluvial and adfluvial) forms remain. Complex movements occur both within and between drainages. Although spawning habitat appears limited, reproduction occurs in at least seven creeks; Divide, Boulder, Canyon, Kennedy, Otatso, Lee and Red Eagle.

This summer's Bull Trout surveys began the final week of July and extended through mid-August. This year's crew consisted mostly of MTFWCO staff including Jim Mogen, Andrew Gilham, Josh Melton, Jason Marsh, Billy Sharp, and Geoff Popken. Bozeman Fish Technology Center employee, Leif Halvorson, and two Service

volunteers, Sarah Mogen and Jason Winterstein, also helped out. The summer of 2017 was extremely hot and dry with numerous fires and record-high temperatures reported throughout the region. Consequently, streamflow was generally lower and warmer than usual prompting us to avoid sampling the smaller shallow streams. The crew used backpack electrofishing units to survey numerous reaches in only four different tributaries of the St. Mary drainage in 2017 – Divide, Boulder, Kennedy and Otatso creeks.



MTFWCO Biologist, Jim Mogen, with a large adfluvial Bull Trout St. Mary River drainage, MT.

Photo: USFWS/Sarah Mogen

As expected, Bull Trout were encountered at all locations; however, overall numbers of fish appeared to be slightly depressed at most locations. Although we did not look outside our sampling units, it's plausible fish were responding to flow conditions by staging in bigger water downstream.

St. Mary Bull Trout (continued)

In all, we PIT-tagged 286 Bull Trout (150-690 mm; 5.9-27.1 in total length) and recaptured 45 fish that were tagged in previous years, including a very old bull trout we first captured as an adult back in 2009.

While in St. Mary, we also downloaded, upgraded and repositioned the two PIT-detection arrays located in lower Boulder Creek

near its confluence with Swiftcurrent Creek. The upgrade and repositioning resulted in PIT detection distances that exceeded the water depth along most of the channel width and should significantly increase our ability to detect tagged fish moving past the antennae. Hopefully these arrays will provide additional insight regarding seasonal movements associated with adult spawning migrations and juvenile emigration. We also downloaded temperature recording devices located near the mouths of 10 different St. Mary tributaries.



MTFWCO Technician, Geoff Popken, sneaking in for a photo of a large group of staging Bull Trout—St. Mary River drainage, MT. Photo: USFWS/Josh Melton

Arctic Grayling Red Rock Lakes NWR, Southwest Montana

Montana FWCO, collaboratively working with Red Rock Lakes National Wildlife Refuge and Montana Fish, Wildlife, and Parks have been investigating the effects of anthropogenic stream channel manipulations on Arctic Grayling spawning migrations from Upper Red Rock Lake to Elk Springs Creek. Arctic Grayling inhabiting Upper Red Rock Lake and its tributaries primarily display an adfluvial life-history where they spend the majority of the year rearing in the lake, but migrate upstream to spawn in cold clean gravel riffles. The number of grayling returning to spawn dramatically declined in 1910 and has never recovered. Elk Springs Creek was diverted into Swan Lake in 1907 by duck hunters attempting to augment waterfowl habitat. Managers have hypothesized that the channel manipulations created inhospitable conditions for migrating Arctic Grayling by forcing them to migrate through Swan Lake.

Elk Springs Creek is a small, spring fed stream that meanders approximately 24 km (15 mi) from its headwaters before entering Upper Red Rock Lake. Fishery managers are particularly interested in Elk Springs Creek because, as a spring creek it has a stable hydrograph and small fluctuations in temperature, which may make it more resilient to the negative impacts of climate change. Fishery managers hypothesized that reclaiming a historical Elk Springs Creek channel could ameliorate the perceived habitat issues and create more favorable stream habitat conditions for migrating Arctic Grayling after Swan Lake is bypassed.



*MTFWCO staff member PIT-tagging a juvenile Arctic Grayling in Elk Springs Creek, Southwest MT.
Photo: USFWS/Billy Sharp*

During the fall of 2016, Elk Springs Creek was re-diverted into a historical channel using fire-line explosives that excised 100 years of vegetative overgrowth.

Jason Marsh, a Montana FWCO biological technician and M.S. graduate research assistant at Montana State University, conducted a preliminary investigation on Arctic Grayling movements in Elk Springs Creek in 2015 and 2016 (prior to diverting Elk Springs Creek) using fixed PIT arrays to determine if Arctic Grayling could successfully migrate through Swan Lake. Our preliminary investigations indicated that only a small fraction ($n=5$) of the 37 tagged juvenile Arctic Grayling successfully navigated Swan Lake.

Following the historical channel restoration, two, adult Arctic Grayling were observed navigating the reclaimed channel in an attempt to reach spawning habitats near the headwaters of Elk Springs Creek in May of 2017, the first confirmed adult grayling in this system in decades.

Arctic Grayling Red Rock Lakes NWR, Southwest Montana (continued)



Map of reclaimed channel path, and fish detection and water quality monitoring sites.

Additionally, 9 juvenile Arctic Grayling, PIT tagged in the spring of 2017, successfully navigated the reclaimed Elk Springs Creek channel.

July and August 2017 field work consisted of continually monitoring and maintaining the 4, PIT array systems installed on Elk Springs Creek, and 1 PIT array installed in Picnic Creek at its confluence with Elk Springs Creek. Additionally, Jason Marsh and seasonal bio-tech Geoff Popken, also conducted habitat surveys throughout 800 m (0.5 mi) of stream habitat near the headwaters of Elk Springs Creek that was restored to augment spawning habitat in addition to the habitat restoration efforts that bypassed Swan Lake. Stream discharge measurements were recorded

in the restored channel which bypasses Swan Lake in June, July, August, and September of 2017 in order to make comparisons among stream discharges recorded in the old channel prior to abandonment.



*MTFWCO technician Jason Marsh checking fish detection data logger near Swan Lake.
Photo: USFWS/Billy Sharp*

September investigations of Elk Springs Creek also included electrofishing the upper half of Elk Springs Creek and Picnic Creek to estimate abundance of all fishes that inhabit Elk Springs Creek.

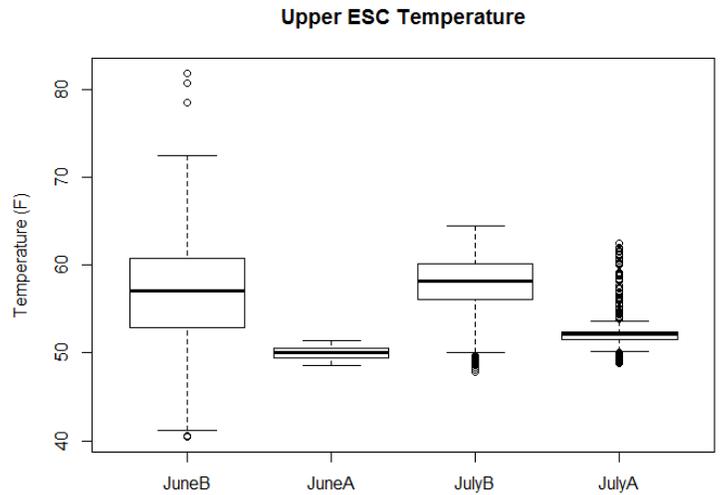
Further investigations on Elk Springs Creek are planned for the 2018 summer field season. MTFWCO plans to continue PIT tagging Arctic Grayling in hopes of gaining additional insight into their movement patterns through the restored stream channel. Dissolved oxygen concentrations and temperature trends will be

Montana FWCO Summer 2017 Activity Summary monitored, and Arctic Grayling abundance will be estimated to determine spawning population trends. MTFWCO will also continue PIT tagging Brook Trout, White Suckers, Burbot, and Yellowstone Cutthroat Trout to determine any potential responses in movement patterns from restoring the historical channel.



Andrew Gilham, a MTFWCO fish biologist, holding the first, adult Arctic Grayling (coined “Moses”) captured in Elk Springs Creek following the historical stream channel reclamation.

Photo: USFWS/Jason Marsh



Monthly temperature plots from before, and after spawning habitat restoration in Elk Springs Creek above its confluence with Picnic Creek. JuneB/JulyB refer to measurements taken before restoration, and June A/JulyA refer to measurements taken after restoration.

Sikes Act work, Malmstrom Air Force Base, MT.

Integrated Weed Management - Goat-grazing

As part of an integrated weed control strategy, biological controls were employed on Malmstrom Air Force Base to compliment herbicide applications. During June, the goat-grazing company arrived with a livestock truck containing 500 goats – the first of two installments – and a full-time shepherd, his dog, and a camper. The goat herd was an instant sensation, when several hundred goat nannies jumped off the livestock truck calling to their many little young ones. The Base residents, as well as the press, thronged to the arrival site. Many local TV news outlets and newspapers posted stories and videos, and base residents visited the goat herd daily. Dr. Elin Pierce coordinated with many Base entities,

and maintained daily logistics coordination to help ensure the goat grazing operation went smoothly until early August, including managing staging sites for goat herder camper, and a reliable water source for the herd. During their 8 week tenure, the goats covered nearly 121 hectares (ha; 300 acres) of vegetation on the eastern side of Malmstrom AFB. Within this area, they knocked back about 27.5 ha (68 acres) of solid weeds, despite the severe drought conditions prevailing in Montana in July and August. Not only did this ensure that the weeds did not set seed, and plants likely not survive the winter, the goats' hooves likely helped to decompact the old soil, and they also added some nutrients to the soil along the way!



*Goat-herder/shepherd Tommy in an on-base area before (left) and after (right) goat grazing.
Photo: Elin Pierce/USFWS*

Integrated Weed Management - insect releases

In July, Dr. Pierce conducted new surveys for 4 weed species [(Canada thistle (*Cirsium arvense*), Common mullein (*Verbascum thapsus*), Dalmatian toadflax (*Linaria dalmatica*), Spotted knapweed (*Centaurea stoebe*)] throughout the undeveloped side of the base, and worked with GeoBase to generate updated distribution maps. To combat the spread of these target weed populations, Malmstrom AFB purchased a total of 5,670 USDA-approved weevil insects. Elin worked with 5 Airmen volunteers to release the weevils at 51 weed-infested sites. Weevil release sites were also mapped with Trimble devices. Each of the 5 species of weevils released is specific to a single host weed species. Once the adult weevils are released and reproduce, they go to work attacking the host plant, either burrowing through the roots or the stem, or eating the seeds while still on the plant. Once established, weevils are a long-term, self-perpetuating method for combating weed populations.



SrA Javier Rodriguez, GIS specialist and volunteer for weevil release project, holding a container of soon to be released weevils and Spotted Knapweed root-boring weevil adults. Photo: Elin Pierce/USFWS

Integrated Natural Resources Management Plan – 2017 Annual Review

Malmstrom AFB, with MTFWCO, annually coordinates the annual review of the Integrated Natural Resources Management Plan (INRMP) for the Base. This year, the review was done in a tripartite meeting held at the Lewis & Clark Museum in Great Falls. Dr. Pierce conducted and coordinated the Tripartite Review meeting between Malmstrom AFB, MTFWCO, Montana Fish Wildlife and Parks and USFWS Helena Ecological Services Office. For this meeting, Elin completed the annual update of INRMP Goals & Objectives, and Work Plans, and meeting specific requirements including; meeting minutes, the final meeting report with tripartite signatures, and finally, obtained the INRMP annual review CE commander's signature.

Sikes Act work, Malmstrom Air Force Base, MT, (continued).

Wildlife Management for Malmstrom AFB

Malmstrom AFB is responsible for 165 nuclear facilities spread throughout a 23,500 km² (9,073 mi²) missile field in central Montana. In order to maintain up-to-date awareness of the sensitive species that base operations may affect, Dr. Pierce created an updated list with the names, locations and current ranking of sensitive and T&E species on the main installation, as well as in the missile complex. This was completed for Fisher, Wolverine, Sprague's Pipit, Swift Fox, and Whitebark Pine. In addition, Elin updated the base wetlands map. This update work was done using base maps and map-layers, and FWS and MT Natural Heritage Program databases for current sensitive species rankings.

Wildland Fire Management

Montana FWCO employees, Judy Kobus-Fisk and Dr. Pierce conducted fieldwork to map with GPS devices all areas grazed by goats to obtain acreage and location data. These data were used by the Base Operations squadron to plan mowing as part of fuels-reduction efforts related to wildland fire prevention on the main installation. In addition, Judy coordinated the arduous task of cleaning up the goat-grazed areas around Powwow Pond, with CEIE. Judy Kobus-Fisk also single-handedly spruced up the poster display at the information kiosk at Powwow Pond, adding many new posters, signs and objects.



Goat herd grazing near Malmstrom AFB heat plant. Photo: Elin Pierce/USFWS

Sikes Act work, Mountain Home Air Force Base, Idaho.

Fire Suppression On The Range:

A century or more after its introduction to the United States, cheatgrass (*Bromus Tectorum*) has become a dominant species in the Intermountain West. The large monocultures of cheatgrass on Saylor Creek Bombing Range (SCR) in the summer months of 2017 contributed to the three major fires on this 44,110 hectare (109,000 acres) range. The Centennial Fire was 7,551 hectares (18,660 acres) of which 6,025 hectares (14,889 acres) were in the northeastern corner of Saylor Creek Bombing Range; the Loveridge Fire (15,641 hectare; 38,650 acres) swept through 7,071 hectares (17,475 acres) of the northwestern corner, narrowly sparing a WWII era training range; and lastly, and the Pence fire (1,233 hectare; 3047 acres) was quickly stymied by the firebreak at the north end of the target area. USFWS (Jamieson-Lee Scott) assisted partners from the Bureau of Land Management (BLM) wildfire support team in identifying critical natural and cultural areas to be avoided during the control and eventual containment of these fires. In an effort to better coordinate response to fire and the need to share cultural, natural, and post-fire rehabilitation data, Jamieson coordinated a new initiative to hold quarterly meetings with the BLM Twin Falls district.

Species Rehabilitation:

There is one species listed as threatened under the Endangered Species Act on Air Force land in Idaho—Slickspot Peppergrass (*Lepidium Papiliferum*). Slickspot peppergrass grows primarily within slickspots. These unique microenvironments consist of bare areas that temporarily pool water and contain soils that are significantly higher in sodium and clay content. Slickspots are typically less than 100 m² (119 square-yards) in size and usually occur in complexes or groups of three to more than 20 individual slickspots.



Invasive cheatgrass tends to dry out early in the year and readily burns when ignited. Photo: Jamieson-Lee Scott/USFWS

Sikes Act work, Mountain Home Air Force Base, Idaho (continued).

To date, critical habitat has been proposed but not designated for this species. In an effort to rehabilitate the species, Jamieson-Lee Scott coordinated with the US Army Corps of Engineers' Cold Region Research & Engineer Lab personnel to collect seed and reintroduce them. Seed collection on Juniper Butte Range was done in July. The

collection was in accordance with USFWS permits given the threatened status of the species. Reintroduction of seeds as part of the rehabilitation of the species was successfully completed in September. Monitoring will occur starting in the spring of 2018 to ascertain germination success.



Slickspot Peppergrass (Lepidium Papiliferum) Photo: Jamieson-Lee Scott/USFWS

Sikes Act work, Mountain Home Air Force Base, Idaho (continued).

Monarch Survey:

While not listed under the Endangered Species Act, Western Monarch Butterflies (*Danaus plexippus*) are seeing a steady decline in numbers across Idaho. Despite being the state insect, there is a surprising data gap regarding the distribution of monarchs and their preferred breeding plant, milkweed (*Asclepias* spp). As part of a wider state collaboration, Jamieson-Lee Scott worked with Xerces Society biologists to identify populations of milkweed on Mountain Home Air Force Base and the greater Mountain Home Range Complex. Records had indicated that no milkweed had been identified on the Base in previous years, but as a result of a late summer survey, Jamieson identified a few individuals on the inside perimeter of the Base in an otherwise heavily disturbed firebreak. The data collected will be added to the Western Monarch Milkweed Mapper, a web-based repository for milkweed and monarch distribution in the west.



*Milkweed on Mountain Home Air Force Base
Photo: Jamieson-Lee Scott/USFWS*

For more information, click on the following logos
Or feel free to contact any of the Montana FWCO
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