Fisheries Division

Federal Aid Job Progress Report

Montana Statewide Fisheries Management

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Project Title: Montana Statewide Fisheries Management

Job Title: Upper Clark Fork Drainage Fisheries Management

Abstract: This report summarizes fish sampling conducted in Warm Springs Pond #3 between 2012 and 2014. Sampling was carried out as part of the fisheries management duties of the Upper Clark Fork fisheries responsibility area located in administrative region 2.

Summary of Fish Sampling in Warm Springs Pond #3

2012-2014

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Introduction:

The Warm Springs Ponds are a series of relatively shallow settling ponds located near Warm Springs, Montana. The pond system was originally constructed with the primary function of trapping suspended mine tailings and contaminated sediments entering the system via Silver Bow Creek. Contamination from Silver Bow Creek originated from a long history of mining and smelting activities in the Butte and Anaconda areas. Construction of the first pond (Pond #1) began in approximately 1910. Ponds #2 and #3 were constructed in approximately 1935 and 1955, respectively. Currently, only Ponds #2 and #3 are part of the active settling system. Operation of the Warm Springs Ponds is managed by Atlantic Richfield Company (ARCO) and their contractors, and the ponds are part of a US Environmental Protection Agency remediation site. Additionally, the pond system is part of the Warm Springs Wildlife Management Area managed by Montana Fish, Wildlife and Parks (FWP). The ponds and surrounding lands are currently leased to FWP for the primary purpose of providing waterfowl nesting and brood rearing habitat. The pond system supports a catch-and-release trout fishery that is popular among anglers for the opportunity to catch trophy-size trout.

Montana Fish, Wildlife and Parks first planted rainbow trout in the Warm Springs Pond System in 1980. The plant consisted of approximately 500 catchable-size fish in both Pond #2 and Pond #3. An additional 500 catchable-size rainbow trout were stocked into Pond #2 the following year, but stocking was largely abandoned in this pond after this plant. Following the initial 1980 plant, stocking began in earnest in Pond #3 in 1987. At this time the department began stocking rainbow fingerlings on an annual basis. Stocking density varied over the years, but typically averaged about 10,000 fish per year through 2013. Beginning in 2008, the department started stocking only triploid (sterile) rainbow fingerlings into Pond #3. This management change was done to try and limit the hybridization risk to westslope cutthroat trout populations present upstream in Silver Bow Creek and its tributaries. In 2014, stocking density in Pond #3 was increased to 20,000 rainbow fingerlings per year. The plant consisted of two separate plants of 10,000 fish each. The department has also annually stocked rainbow fingerlings in the Wildlife Pond (also known as the Hog Hole) located along the dam face of Pond #3 since 1998. Other species that have been stocked into the Warm Springs Pond system include brown trout and westslope cutthroat trout. About 5,000 fingerling brown trout were stocked into Pond #3 each year from 2000 through 2013, and westslope cutthroat trout have been stocked (5,000 fingerlings) into Pond #3 annually since 2008.

Pond #3 is approximately 800-acres in size with a maximum depth of around 20 feet. However, over the vast majority of the surface area of the pond, depth is less than 6 feet. Being relatively shallow and receiving high nutrient loads from Silver Bow Creek, the pond is extremely productive. Aquatic macrophytes are very abundant during the summer months. The invertebrate community in the pond system, particularly scuds, is also very robust. This provides an abundant food supply for stocked fish. Despite this benefit, the pond struggles with water quality issues that can make survival difficult for fish. The primary concerns are high water temperature during the summer months, low dissolved oxygen levels, high pH, and the presence of metals and metalloids such as copper and arsenic. The presence of ammonia is also a possible concern, and needs further investigation.

Prior to 2012, no known fish sampling was conducted in the Warm Springs Pond system despite the lengthy stocking history in Pond #3. In an effort to establish a baseline data set from which future management decisions could be better based, a gillnet survey was carried out on Pond #3 in May of 2012, 2013 and 2014. This report summarizes these efforts

Methods

Fish sampling in Warm Springs Pond #3 was completed in early May of 2012, 2013, and 2014. Sampling consisted of setting five 125 ft-long by 6 ft-deep experimental gillnets overnight for two consecutive nights for a total of 10 nets set in each sample year. Nets set included seven floating nets and 3 sinking nets. Figure 1 shows the general location of where nets were placed. Nets were set in approximately the same locations in all sample years. Upon soaking overnight, nets were pulled the following morning. All fish captured were removed from the nets, measured for total length, and many were weighed. Trout captured were also examined for a missing adipose fin as some fish stocked in 2012 had this fin removed in the hatchery. Every effort was made to get fish that were still alive in the nets measured and back in the water as soon as possible. Data was summarized for each sample year by grouping the 10 nets together and obtaining total catch numbers, as well as mean fish per net, mean total length, and range of lengths observed for each species captured.

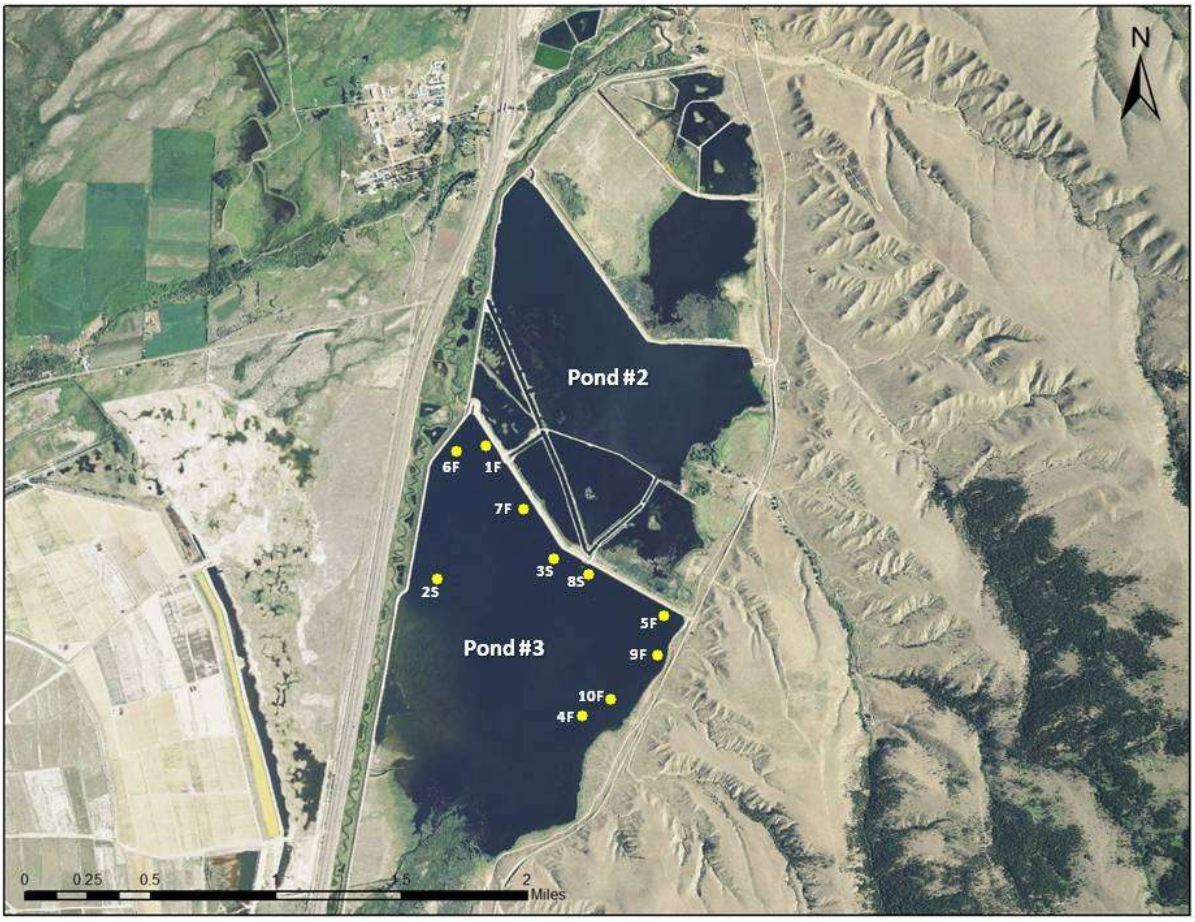

Figure 1. Map of the Warm Springs Pond System with Pond # 3 gillnet locations indicated by yellow dots. Nets were set in the same approximate location in all sample years (2012, 2013, and 2014). The letter after each net number indicates whether it was a floating (F) or sinking (S) net.

Results:

Species captured during the gillnetting efforts on Warm Springs Pond #3 between 2012 and 2014 included rainbow trout, brown trout, westslope cutthroat trout, brook trout, longnose sucker and largescale sucker. While sucker species tended to be the most common fish in the pond based on this sampling, rainbow trout were the most common trout species present. The longest rainbow trout measured during these efforts was 715 mm in total length (or approximately 28 inches). This fish was unable to be weighed accurately but was in excess of 3,550 gm (or about 7.8 lbs).The heaviest fish we were able to weigh was 4,532 gm (or about 10 lbs) and was 700 mm in length (or about 27.6 inches). Table 1 contains a summary of fish collected in Pond #3 throughout the sample period.

A total of six fish that had their adipose fin removed in the hatchery prior to being planted into Pond # 3 in September of 2012 were captured in our gillnets in May of 2013. The average length of the lot of fish planted in 2012 was 137 mm (5.4 inches), and the average length of the six adipose clipped fish captured in our gillnets the following May was 280 mm (11.0 inches). When averaged over the time the fish were in the pond, it equals roughly 18.4 mm (or about 0.75 inches) of growth per month.

Table 1. Gillnet data collected from Warm Springs Pond #3 in 2012, 2013, and 2014. Ten gillnets were set in each sample year. Nets set were a combination of seven floating nets and three sinking nets. Species abbreviations are as follows: RB=Rainbow Trout, LL=Brown Trout, WCT=Westslope Cutthroat Trout, EB=Brook Trout, LNSU=Longnose Sucker, and LSSU=Largescale Sucker.

Year	Species	Total Number of Fish Captured	Mean Fish per Net	Mean Length (mm)	Length Range (mm)
2012	RB	43	4.3	543	288-715
	LL	7	0.7	497	454-600
	WCT	4	0.4	332	233-422
	EB	1	0.1	379	n/a
	LNSU	249	24.9	201	143-404
	LSSU	16	1.6	269	162-430
2013	RB	50	5.0	506	263-702
	LL	0	-	-	-
	WCT	6	0.6	364	327-425
	EB	0	-	-	-
	LNSU	200	20.0	212	155-332
	LSSU	99	9.9	316	167-516
2014	RB	31	3.1	484	228-694
	LL	2	0.2	618	604-632
	WCT	3	0.3	401	333-468
	EB	1	0.1	296	n/a
	LNSU	66	6.6	185	157-297
	LSSU	55	5.5	337	189-509

Discussion:

Based on data gathered in this sampling effort, trout in Warm Springs Pond #3 are not overly abundant. While the fish that were encountered tended to be relatively large, overall densities were rather low. Rainbow trout were approximately 3 to 5 times more abundant than other trout species present in the pond, but the species was still not very common. This suggests that survival of planted fish is low, and/or that current stocking rates are not high enough. This is particularly true for brown trout. While 5,000 fingerling brown trout have been planted in Pond # 3 annually since 2000, we only encountered 9 individuals in three years of gillnetting. This kind of return likely does not warrant the continued stocking of brown trout in Pond #3, especially given management concerns of this species becoming established in Silver Bow Creek, where to date none have been observed. The story for westslope cutthroat trout in Pond #3 is somewhat similar to that of brown trout. Although 5,000 fingerlings have been planted in the pond annually since 2008, only 13 cutthroat trout were encountered during our three year gillnet study. Additionally, the presence of wild cutthroat trout in Silver Bow Creek and its tributaries confounds this finding. During this sampling we were unable to determine whether cutthroats captured in the gillnets were from hatchery origin or were actually wild fish that migrated from upstream (or some combination of the two). Marking hatchery cutthroat trout with an external mark will likely be carried out in the future to determine how to best manage this plant. The two brook trout captured over the three years of this sampling effort were most likely wild fish that migrated downstream from Silver Bow Creek where the species is rather common.

It is unfortunate that no prior data is available to compare the findings of this sampling effort to. Beginning in 2008, the decision was made to switch the Pond #3 plant from standard diploid rainbow fingerlings that were an Eagle Lake strain to triploid fish of the Arlee strain that had recently become available. The decision to switch to triploid fish centered on their sterility and the reduced risk of hybridization with native westslope cutthroat trout present in Silver Bow Creek and its tributaries. This had become an increasing concern as cleanup of Silver Bow Creek progressed and water quality improved allowing fish in the pond to migrate upstream into Silver Bow Creek. What is not well understood is whether switching strains or switching to triploid fish had an effect on rainbow trout density in Pond #3. Regardless, the findings of this study suggest that an increased number of rainbow fingerlings should be stocked into the pond over the next several years to see if an increase in recruitment to the fishery can be observed. Future sampling will likely be conducted on an every third year basis with the next sampling event scheduled to occur in 2017.

With regard to suckers, the sampling summarized in this report suggests that sucker species are fairly common in Warm Springs Pond #3. However, densities based on our gillnet catches were relatively variable among the different sample years. This may have been due to slight changes in specific net locations rather than actual changes in abundance. Sinking nets tended to capture the majority of the suckers observed, with one net in particular comprising about 43% of the catch over the three sample years. This net, # 8S (Figure 1), was moved slightly in 2014 in an effort to avoid an extremely high catch of suckers. This may have been a primary cause of what appeared to be reduced sucker numbers in 2014 compared to the first two sample years.