Fisheries Division

Federal Aid Job Progress Report

Montana Statewide Fisheries Management

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Job Title: Upper Clark Fork Drainage Fisheries Management

Abstract: This report summarizes fish sampling and fisheries related surveys conducted in waters of the upper Clark Fork River basin (not including the Clark Fork River, Silver Bow Creek or NRDP priority tributaries, which are summarized in other reports) during the 2017 and 2018 field seasons. Sampling was carried out as part of the fisheries management duties of the Upper Clark Fork fisheries responsibility area located in administrative region 2.

Upper Clark Fork River Basin

Fisheries Sampling

2017 & 2018

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TABLE OF CONTENTS

LAKES and PONDS

PURPOSE

This report summarizes fish sampling and fisheries related surveys conducted in streams, lakes and ponds of the Upper Clark Fork River basin during the field seasons of 2017 and 2018. Sampling was carried out as part of the fisheries management duties of the Upper Clark Fork fisheries responsibility area located in administrative region 2. This report does not include monitoring conducted on the upper Clark Fork River, Silver Bow Creek, or other priority tributaries as defined in the Natural Resource Damage Program's *Final Upper Clark Fork River Basin Aquatic and Terrestrial Resources Restoration Plans (NRDP 2012)*. Sampling in these waters is summarized in the 2017 and 2018 Upper Clark Fork basin fisheries monitoring reports (Cook et. al 2017 and Cook et. al 2018).

METHODS

Fish Sampling

Streams:

The focus of stream sampling was primarily to assess species composition and general abundance at a broad scale. A backpack electrofishing unit (Smith-Root LR-24 and/or LR-20B) was used to collect fish at all sites. Sampled reaches varied in length but were typically 100 – 200 m long. Population estimates were completed at many sites. Estimates used multiple-pass (typically 2 or 3) depletion methodology. Single-pass, catch-per-unit-effort (CPUE) electrofishing was also used at locations where little or no prior survey information was available, or where survey conditions made obtaining a population estimate difficult. At each sample reach, all captured fish were identified to species (based on phenotypic characteristics), weighed, measured.

Lakes and Ponds:

The focus of lake and pond sampling was to assess species composition and general abundance in sampled waters. At most locations, experimental, monofilament gillnets were used to sample fish, although angling was also utilized at several mountain lakes. Gillnets were 125 ft long and were either 4 or 6 feet deep depending on the size of the water being sampled. All nets were set in the evening and retrieved the following morning. Fish captured in each net were identified to species (based on phenotypic characteristics), weighed and measured. Angling consisted of one or two persons using spinning rods with either a fly and bobber rig or small spinners and spoons. The amount of time fished was recorded and all fish caught were identified to species, measured, and released. Genetic samples were also collected from fish where no prior genetic information had been collected.

Data Summary

Fishery data was summarized for each sample location by species and included the number of fish captured (first pass only for stream locations where multiple passes were made), catch-per-unit-effort (standardized to number of fish per 100 m of channel or number of fish per net), mean and range of fish lengths, and percent of species composition. Tables displaying this information were created for each sampled stream, lake or pond. At stream sites where population estimates were made, an estimate value with a 95% confidence interval was reported. Population estimates were calculated using Montana Fish, Wildlife and Parks' Fisheries Information System. For depletion surveys, estimates were produced using Zippin's removal method for fish 75 mm in total length and larger. Values were reported in the number of fish per 100 m of channel length. Trout were the only species considered in many of these data summary efforts although observations of others species were sometimes noted in the tables and write-ups.

RESULTS

STREAMS

Gold Creek Drainage

Gold Creek

A population estimate was completed at one site on Gold Creek in late summer of 2018. The 200 m sample section was located near RM 0.3 and was first sampled in 2015 (Lindstrom 2017). Table 1 contains a summary of results from the first electrofishing pass. Like previous years, brown trout dominated the trout community at the site, with many of the fish captured being under 100 mm in total length. Westslope cutthroat trout were also observed in 2018, but the species was relatively uncommon (Table 1). Rocky Mountain sculpin were also noted as present in the reach. The estimate for brown trout 75 mm and larger was 69 per 100 m (95% confidence interval: +/- 3.8). This estimate was the lowest since sampling was initiated in 2015 (Figure 1). Further analysis of the data showed that much of the difference observed over the three sample years was largely related to fish under 175 mm in total length. It is possible that above average flows throughout 2018 prompted the outmigration of many juvenile fish to the Clark Fork River. Larger fish in the reach showed less variability over the period of record. Brown trout greater than 175 mm averaged 26 fish per 100 m since sampling began in 2015. The estimate for cutthroat trout at RM 0.3 in 2018 was 1.5 per 100 m. This estimate was like what was observed in previous sample years (Figure 1).

Table 1. Electrofishing data collected at one section of Gold Creek in 2018. Data presented is from the first electrofishing pass.

Year	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
2018	LL	101	50.5	176	63-422	97
	WCT	3	1.5	318	272-372	3

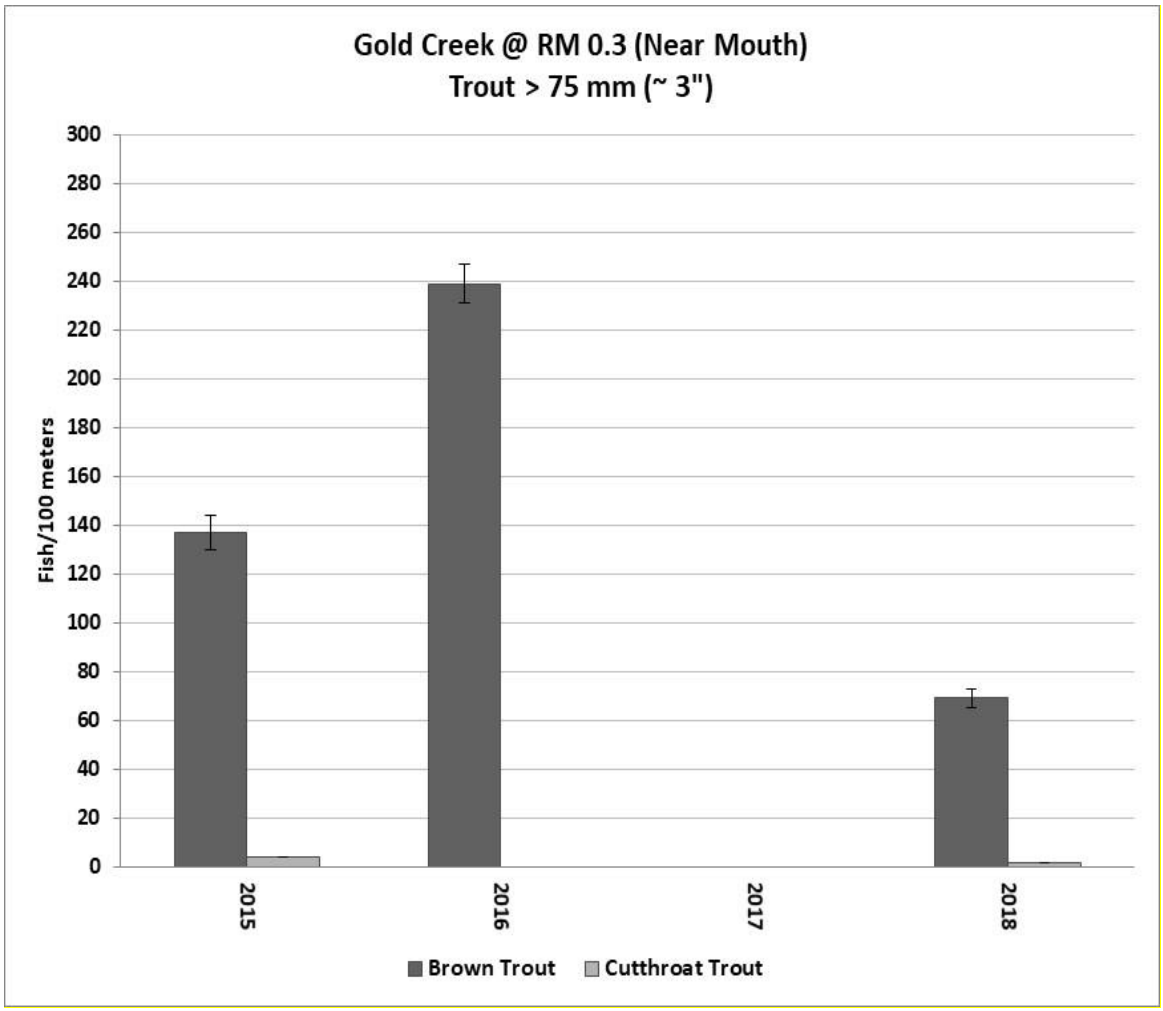

Figure 1. Depletion estimates for trout greater than 75 mm in total length collected in Gold Creek at RM 0.3 for the period of record. Note: No sampling was completed in 2017.

Little Blackfoot River Drainage

Spotted Dog Creek

Fish population surveys were completed at four sites on Spotted Dog Creek during the summer of 2018. The sites were located at RM 6.5, 7.9, 9.8, and 11.3, all of which were above Spotted Dog Reservoir. Table 2 contains a summary of results for trout captured at each sample location. Westslope cutthroat trout and brook trout were present at all sample sites, but densities were variable. At RM 6.5, both species appeared to be present in similar numbers, although overall densities were relatively low. The estimate for cutthroat trout 75 mm and larger was 13 per 100 m (95% confidence interval: +/- 1). The estimate for brook trout was of poor quality due to relatively low numbers of fish and a poor removal pattern. In all, 13 brook trout greater than 75 mm in total length were

captured in three electrofishing passes through the section. In addition to trout, 13 longnose suckers were also collected at the RM 6.5 site These fish ranged in length from 93 to 165 mm. At RM 7.9, brook trout were over twice as common as cutthroat. The estimate for cutthroat trout 75 mm and larger was 14 per 100 m (95% confidence interval: +/- 0.6), while for brook trout it was 34 per 100 m (95% confidence interval: +/- 1). In addition to trout, three longnose suckers were also observed at the sample site ranging in length from 140 to 188 mm. At RM 9.8, cutthroat and brook trout were found in roughly equal numbers. The estimate for cutthroat trout 75 mm and larger was 55 per 100 m (95% confidence interval: +/- 13.4), and for brook trout it was 53 per 100 m (95% confidence interval: +/- 7.3). At RM 11.3, westslope cutthroat trout dominated the trout community, but brook trout were still present in low numbers. The estimate for cutthroat trout 75 mm and larger was 29 per 100 m (95% confidence interval: +/- 7.7), and for brook trout it was 1 per 100 m (95% confidence interval: +/- 0).

Table 2. Electrofishing data collected at four sections of Spotted Dog Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 6.5	WCT	11	11	154	27-214	48
	EB	12	12	85	50-154	52
RM 7.9	WCT	13	13	147	94-228	27
	EB	36	36	114	36-156	73
RM 9.8	WCT	34	34	100	52-169	52
	EB	32	32	98	38-168	48
RM 11.3	WCT	16	16	94	59-134	94
	EB	1	1	165	na	6

South Fork Spotted Dog Creek

Fish population surveys were completed at two sites on the South Fork of Spotted Dog Creek during the summer of 2018. The sites were located at RM 1.8 and 4.6 and were both within the Spotted Dog Wildlife Management Area. Table 3 contains a summary of results for trout captured at each sample location. Westslope cutthroat trout and brook trout were the only trout species present at both sample sites. At RM 1.8, brook trout were very abundant and far outnumbered cutthroat trout. The estimate for brook trout 75 mm and larger was 59 per 100 m (95% confidence interval: +/- 3.1), while for cutthroat it was 11 per 100 m (95% confidence interval: +/- 1.5). In addition to trout, three longnose suckers were also collected in the South Fork of Spotted Dog Creek at RM 1.8. These fish ranged in length from 126 to 205 mm. At RM 4.6 brook trout were much less

abundant than at RM 1.8, but they still appeared to be slightly more common than cutthroat trout. The estimate for brook trout 75 mm and larger was 17 per 100 m (95% confidence interval: +/- 1.7), while for cutthroat trout it was 9 per 100 m (95% confidence interval: +/- 0.2).

Table 3. Electrofishing data collected at two sections of the South Fork of Spotted Dog Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.8	WCT	10	10	155	34-225	10
	EB	93	93	106	43-302	90
RM 4.6	WCT	8	8	107	76-135	40
	EB	12	12	149	96-196	60

Middle Fork Spotted Dog Creek

Fish population surveys were completed at two sites on the Middle Fork of Spotted Dog Creek during the summer of 2018. The sites were located at RM 0.3 and 2.4 and were both within the Spotted Dog Wildlife Management Area. Table 4 contains a summary of results for trout captured at each sample location. Westslope cutthroat trout and brook trout were the only trout species observed in the Middle Fork during these sampling events. At RM 0.3 cutthroat and brook trout were both present, but in relatively low numbers. The estimate for cutthroat trout 75 mm and larger was 8 per 100 m (95% confidence interval: +/- 0), while for brook trout it was 5 per 100 m (95% confidence interval: +/- 1.0). In addition to trout, three longnose suckers were also captured at this site. These fish ranged in size from 190 to 220 mm. At RM 2.4, cutthroat trout were the only species observed. The population estimate for fish greater than 75 mm in total length was 14 per 100 m (95% confidence interval: +/- 4.2).

Table 4. Electrofishing data collected at two sections of the Middle Fork of Spotted Dog Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.3	WCT	8	8	155	95-300	67
	EB	4	4	151	115-184	33
RM 2.4	WCT	19	19	78	54-117	100

North Fork Spotted Dog Creek

A fish population survey was completed at one site on the North Fork of Spotted Dog Creek during the summer of 2018. The site was located upstream of the road crossing just above the confluence with Spotted Dog Creek. Table 5 contains a summary of results for trout captured at the site. Westslope cutthroat trout and brook trout were the only species present in the survey segment, with cutthroat being the most abundant. The estimate for cutthroat trout 75 mm and larger was 22 per 100 m (95% confidence interval: +/- 1.9), while for brook trout it was 2 per 100 m (95% confidence interval: +/- 2.0).

Table 5. Electrofishing data collected at two sections of the North Fork of Spotted Dog Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Above Road Crossing	WCT	15	15	113	96-140	94
	EB	1	1	123	na	6

Trout Creek

Fish population surveys were completed at three sites on Trout Creek during the summer of 2018. The sites were located at RM 4.5, 7.0 and 9.4 and all were all within the Spotted Dog Wildlife Management Area. Table 6 contains a summary of results for trout captured at each sample location. Westslope cutthroat trout comprised much or all the fish community at the sample sections. While brook and brown trout were observed at the lowest site (RM 4.5), neither species was overly abundant. In fact, at RM 4.5, fish density of all species was relatively low. The estimate for cutthroat trout 75 mm and larger was 10 per 100 m (95% confidence interval: +/- 2.2), while for brook trout it was 4 per 100 m (95% confidence interval: +/- 0). Only a single brown trout was captured in this section of Trout Creek in 2018. In addition to trout, five longnose suckers, ranging in length from 97 to 185 mm were observed at RM 4.5. At RM 7.0 and 9.4, westslope cutthroat trout

were the only species observed in the sample sections. At RM 7.0, the estimate for fish greater than 75 mm in total length was 47 per 100 m (95% confidence interval: +/- 1.2), and at RM 9.4 it was 68 per 100 m (95% confidence interval: +/- 3.4).

Table 6. Electrofishing data collected at three sections of Trout Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 4.5	WCT	5	5	184	115-266	50
	EB	4	4	192	153-250	40
	LL	1	1	159	na	10
RM 7.0	WCT	44	44	112	44-194	100
RM 9.4	WCT	60	60	102	63-198	100

O' Neill Creek Drainage

O' Neill Creek

Fish population surveys were completed at two sites on O'Neill Creek during the summer of 2018. The sites were located at RM 1.7 and 2.9, both of which were on the Spotted Dog Wildlife Management Area. Table 7 contains a summary of results for trout captured at each sample location. Westslope cutthroat trout were the only fish observed in both sample sections. At RM 1.7, the estimate for fish greater than 75 mm in total length was 26 per 100 m (95% confidence interval: +/- 2.1), while at RM 9.4 it was much higher at 139 per 100 m (95% confidence interval: +/- 8.5).

Table 7. Electrofishing data collected at two sections of O'Neill Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.7	WCT	23	23	129	35-212	100
RM 2.9	WCT	86	115	110	63-193	100

Freezeout Creek Drainage

Freezeout Creek

A single fish population survey was completed on Freezeout Creek during the summer of 2018. The site was located at RM 2.9 and was within the Spotted Dog Wildlife Management Area. Table 8 contains a summary of results. Westslope cutthroat trout and brook trout were both observed in the section at RM 2.9, but brook trout were noticeably more abundant. The estimate for cutthroat greater than 75 mm in total length was 7 per 100 m (95% confidence interval: +/- 0), while for brook trout it was 76 per 100 m (95% confidence interval: +/- 2.6). Additionally, no young juvenile cutthroat were observed in the sample reach suggesting limited recruitment.

Table 8. Electrofishing data collected at one section of Freezeout Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 2.9	WCT	7	7	186	111-235	11
	EB	57	57	109	70-235	89

Jake Creek

A single fish population survey was completed on Jake Creek during the summer of 2018. The site was located at RM 4.1 and was within the Spotted Dog Wildlife Management Area. Table 9 contains a summary of results. Westslope cutthroat trout were the only fish observed at the site. The population estimate for fish greater than 75 mm in total length was 29 per 100 m (95% confidence interval: +/- 2.1).

Table 9. Electrofishing data collected at one section of Jake Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 4.1	WCT	19	19	109	70-138	100

Fred Burr Creek Drainage

Fred Burr Creek

A single fish population survey was completed on Fred Burr Creek during the summer of 2018. The site was located at RM 6.5 and was within the Spotted Dog Wildlife Management Area. Table 10 contains a summary of results. Westslope cutthroat trout and brook trout were the only species observed at the sample site, with cutthroat being the more abundant species. The population estimate for cutthroat greater than 75 mm in total length was 37 per 100 m (95% confidence interval: +/- 3.2), while for brook trout it was 4 per 100 m (95% confidence interval: +/- 1.2). In addition to the moderate density of larger cutthroat in the reach, numerous (21) young-of-the-year were observed but not collected during the first pass of the survey for fear of high mortality.

Table 10. Electrofishing data collected at one section of Fred Burr Creek in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 6.5	WCT	43	43	84	37-179	83
	EB	9	9	76	57-165	17

Modesty Creek Drainage

Modesty Creek

In 2015, the lower reach of Modesty Creek was reconstructed and reconnected to the Clark Fork River as part of the Clark Fork River remediation and restoration effort carried out by the Department of Environmental Quality and the Natural Resource Damage Program. Prior to the project, Modesty Creek was intercepted by the West Side Ditch and had no direct connection to the river. Sampling conducted in 2017 was a continued effort to monitor fish response to this reconnected tributary. Fish surveys were completed in late June at two sections. The sites were located near the mouth of the constructed channel and farther upstream near the upper extent of the reconstructed reach. Table 11 contains a summary of results for trout captured at each sample location.

Two electrofishing passes were made through the sample section near the mouth. A total of 38 brown trout were captured in the 400-m section, but most of the fish captured were young-of-the-year. Only three fish were over 75 mm in length. Additional fish observed in the reach included 48 largescale suckers (length range: 49-105 mm), three longnose suckers (length range: 67-116 mm), 62 redside shiners (length range: 29-99 mm), seven mountain whitefish (length range: 62-75 mm), 11 longnose dace (length range: 40-55

mm), and five Rocky Mountain sculpin (length range: 77-85 mm). Two western toads and three crayfish were also noted in the section.

Only a single electrofishing pass was made through the 200-m section near the upper extent of the reconstructed reach. Relatively low fish densities and the small size of most fish captured did not warrant an additional pass. Juvenile brown trout were the only trout captured, with all but one being young-of-the-year. Additional fish observed included 13 largescale suckers (length range: 60-123 mm), five longnose suckers (length range: 70-190 mm), seven redside shiners (length range: 39-97 mm), six mountain whitefish (length range: 63-75 mm), and one Rocky Mountain sculpin (length: 117 mm).

Table 11. Electrofishing data for trout collected at two sections of Modesty Creek in 2017. Data presented is from the first electrofishing pass in sections where multiple passes were made.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Mouth	LL	31	7.75	60	41-200	100
Upper Rechanneled Area	LL	17	8.5	59	48-143	100

Dry Cottonwood Creek Drainage

Dry Cottonwood Creek

In 2017, electrofishing surveys were completed in late June on three sections of Dry Cottonwood Creek. The sites were located at RM 0.3, 2.8, and 5.3. Table 12. contains a summary of results for trout captured at each sample location. The site at RM 0.3 was downstream of the Eastside Road crossing. Only two trout were captured in this section, and both were young-of-the-year brown trout. Given that Dry Cottonwood Creek is dry in this section of the stream during the fall (when brown trout are spawning), these two fish likely moved upstream out of the Clark Fork River. Additional fish observed at RM 0.3 included seven redside shiners (length range: 70-100 mm).

At RM 2.8, westslope cutthroat trout were the only fish present in Dry Cottonwood Creek. Fish density was fairly low in the survey section. The population estimate for fish greater than 75 mm in length was 20 per 100 m (95% confidence interval: +/- 3.7). One adult western toad was also observed at RM 2.8. At RM 5.3, westslope cutthroat trout remained the only fish present in Dry Cottonwood Creek. Fish were more plentiful at this location. The population estimate for fish greater than 75 mm in length was 48 per 100 m (95% confidence interval: +/- 3.1).

Table 12. Electrofishing data for trout collected at three sections of Dry Cottonwood Creek in 2017. Data presented is from the first electrofishing pass in sections where multiple passes were made.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Below Eastside Road	LL	2	1.2	57	56-58	100
Lower – State Land	WCT	11	11	114	88-174	100
Upper – Forest Service	WCT	45	45	104	59-183	100

Warm Springs Creek Drainage

Warm Springs Creek

In both 2017 and 2018, electrofishing was conducted on Warm Springs Creek immediately below the Meyers diversion dam located near RM 16.6, as well as below the Meyers intake house diversion dam located near RM 16.5. The intent of this sampling was to capture and pass migrating bull trout whose upstream migration was blocked by these structures. Only bull trout captured in these efforts were passed upstream of the dams, with all other species released downstream.

In 2017, electrofishing was completed on six days (between July 26th and September 12th) immediately below Meyer's Dam, and on three days (between August 30th and September 21st) below the intake house diversion. Four bull trout were captured and moved upstream of Meyers Dam because of these efforts. Three were captured below Meyers Dam and one was captured below the intake house dam. 2017 was the first year sampling was done below the intake house diversion, and electrofishing wasn't initiated until late in the season. Sampling was done at this location because most of the water in Warm Springs Creek was being routed to this site. Holding habitat was not very good below the intake house diversion dam, and sampling was difficult due to the volume of water present. Table 13 contains a summary of all fish captured below both diversions during the sample period.

Table 13. Electrofishing data collected on Warm Springs Creek below Meyers Dam and the Meyers intake house diversion in 2017.

Site	Species	Number of Fish Captured	Mean Length (mm)	Length Range (mm)
Meyers Dam	BULL	3	254	193-365
	EB	16	177	116-244
	WCT	18	232	108-342
	RB	1	170	na
	WCTxRB	6	204	144-302
	LL	47	210	94-428
Intake House	BULL	1	271	na
	EB	3	217	177-245
	WCT	2	157	120-193
	RB	0	na	na
	WCTxRB	0	na	na
	LL	13	205	102-357

In 2018, electrofishing was completed on seven days (between July 30th and September 10th) immediately below the Meyers diversion dam, as well as below the Meyers intake house diversion dam. In 2018, flows were above average at both sites. Three bull trout were captured and moved upstream in these efforts. All were collected immediately below Meyers Dam. Table 14 contains a summary of all fish captured at both sites.

Table 14. Electrofishing data collected on Warm Springs Creek below Meyers Dam and the Meyers intake house diversion in 2018.

Site	Species	Number of Fish Captured	Mean Length (mm)	Length Range (mm)
Meyers Dam	BULL	3	315	193-543
	EB	9	172	95-243
	WCT	4	277	167-365
	RB	0	na	na
	WCTxRB	4	303	177-397
	LL	19	225	112-408
Intake House	BULL	0	na	na
	EB	3	147	146-148
	WCT	3	255	92-338
	RB	1	97	na
	WCTxRB	1	93	na
	LL	27	192	59-381

Twin Lakes Creek

In both 2017 and 2018, electrofishing was conducted in a 200 m reach immediately below the Silver Lake diversion dam on Twin Lakes Creek in an effort to capture and pass migrating bull trout upstream. This dam occurs at approximately RM 2.2 and precludes all upstream fish passage. Only bull trout captured in these efforts were passed upstream of the dam, with all other species released downstream. In 2017, electrofishing was completed on seven days between July 27th and September 12th. Table 15 contains a summary of fish collected during this period. In total, nine bull trout were captured and moved over the diversion because of these sampling efforts. Many of the fish however, were rather small with only two being over 300 mm in length. In 2018, electrofishing was completed on six days between July 30th and September 10th. Three bull trout were captured and moved over the diversion in these efforts including one relatively large individual over 600 mm in length. Table 15 contains a summary of all fish captured in 2018.

Table 15. Electrofishing data collected below the Silver Lake diversion dam on Twin Lakes Creek in 2017 and 2018.

Year	Species	Number of Fish Captured	Mean Length (mm)	Length Range (mm)
2017	BULL	9	263	129-453
	EB	8	170	143-205
	WCT	90	205	38-305
	WCTxRB	5	157	117-204
2018	BULL	3	375	205-605
	EB	2	184	144-224
	WCT	27	207	120-315
	WCTxRB	2	172	153-190

Storm Lake Creek

In 2017 and 2018, dipnets were used to capture fish immediately below the Silver Lake diversion dam near the mouth of Storm Lake Creek. This dam occurs at approximately RM 0.1 and precludes all upstream fish passage. The intent of the netting was to capture bull trout migrating up out of Silver Lake and pass them upstream of the diversion so they could presumably move up Storm Lake Creek to spawn. Only bull trout were passed upstream, with all other species released downstream. In 2017, sampling was completed on 13 days between July 17th and September 12th. A total of 29 bull trout were captured and moved over the diversion as a result of this effort. Table 16 contains a summary of all

fish captured below the diversion during this period. In 2018, sampling was completed on 14 days between July 23rd and September 10th. Fifteen bull trout were captured and moved over the diversion in this year. Table 16 contains a summary of all fish captured during this sampling effort.

Table 16. Sampling data collected below the Silver Lake diversion dam on Storm Lake Creek in 2017 and 2018.

Year	Species	Number of Fish Captured	Mean Length (mm)	Length Range (mm)
2017	BULL	29	488	384-610
	EBxBULL	10	487	390-635
	WCT	2	292	174-409
2018	BULL	15	472	427-513
	EBxBULL	5	541	516-625

Mill Creek Drainage

Cabbage Gulch

A single fish population survey was completed on Cabbage Gulch during the summer of 2018. The site was located at RM 1.1 and was within the Mount Haggin Wildlife Management Area. Table 17 contains a summary of results. Westslope cutthroat trout were the only species observed in the sample section, and most of the individuals collected were young juveniles under 100 mm in length. The population estimate for fish longer than 75 mm was 7 per 100 meters (95% confidence interval: +/- 0.8).

Table 17. Electrofishing data collected at one section of Cabbage Gulch in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.1	WCT	14	14	77	56-131	100

Muddy Gulch

A fish presence/absence survey was completed on Muddy Gulch during the summer of 2018. The site was located just upstream of the Mill Creek Highway crossing and was within the Mount Haggin Wildlife Management Area. Sampling focused on the best habitat available between the following coordinates: Downstream 46.04204ºN, 112.97804ºW; Upstream 46.04113ºN, 112.97564ºW. No fish were captured or observed during this effort.

German Gulch Drainage

Norton Creek

Electrofishing was completed throughout a rather extensive area of Norton Creek in 2017. The primary purpose for this work was to remove brook trout from the stream. This suppression effort was initiated in 2003 to benefit westslope cutthroat trout that were in jeopardy of extirpation from competition with brook trout. At that time, brook trout comprised over 90% of the fish community in Norton Creek. The removal effort was completed annually from 2003 through 2009, and then again in 2011, 2013 (partial effort), and 2014. This ongoing suppression project has occurred within a 4.4 km reach stretching from approximately RM 0.5 to RM 3.0. Within this segment of the stream, 44 continuous 100 m sections have been delineated. Sampling since 2003 has consisted of single pass electrofishing through each sample section (when possible). This sampling has typically been conducted in late August or early September. All fish collected were measured and either returned to the stream (westslope cutthroat trout) or humanely dispatched and removed (brook trout). Westslope cutthroat trout less than 75 mm in total length were not targeted in most of the surveys, although sometimes a count was made when crews observed them.

In 2017, only 40 of the 44 sections were sampled due to time and crew constraints. Sections surveyed included 1-14, 17-31, and 33-43. In this effort, westslope cutthroat trout were the dominant species comprising 61% of the trout community for fish 75 mm and greater. A total of 2,015 brook trout were removed. Table 18 contains a summary of data collected in 2017. Figure 2 shows the trend in species composition since sampling began in 2003.

Table 18. Electrofishing data collected on Norton Creek in 2017.

Section	Species	Total Number of Fish Captured	Number of Fish > 75mm Captured	Mean Length (mm) All Fish	Length Range (mm) All Fish	Species Composition for Fish > 75 mm (%)
1-14, 17-31, & 33-43	WCT	2,067*	1,922	115	28-238	61
	EB	2,015	1,234	108	27-285	39

**This value only includes fish captured and measured. It does not include WCT fry that were purposely not collected.*

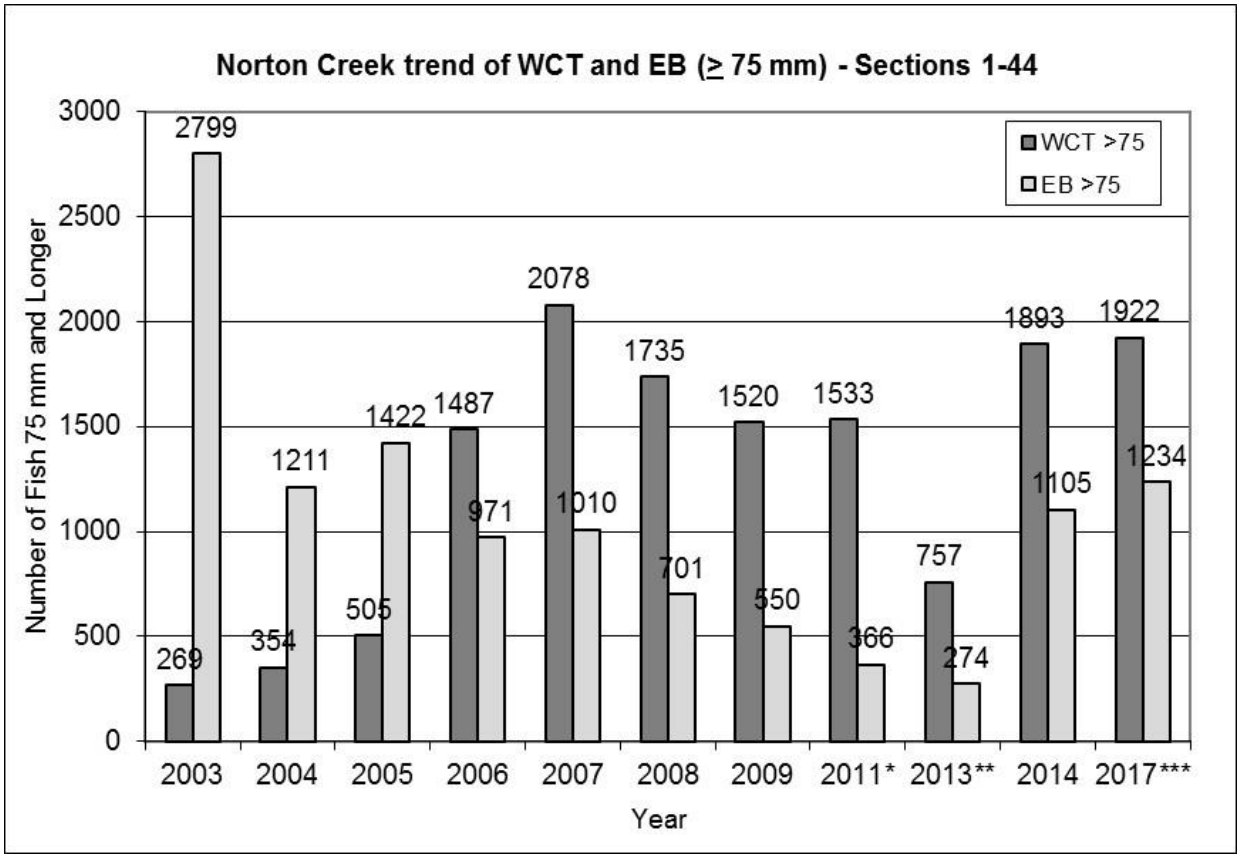

Figure 2. Trout catch by species for westslope cutthroat trout and brook trout in Norton Creek brook trout suppression reaches 1 through 44 for the period of record. (*Includes sections 4-44. 1-3 were inundated by beaver ponds. ** Includes sections 1-14 and 24 & 25. *** Includes sections 1-14, 17-31, and 33-43.)

In 2018, one 100 m section in the lower portion of Norton Creek was sampled to check the status of brook trout presence. The site sampled was Section # 4 of the established brook trout removal reaches. Table 19 contains a summary of results from this survey. Westslope cutthroat trout and brook trout were both relatively abundant in the reach,

although brook trout appeared to slightly outnumber cutthroat. The estimate for cutthroat greater than 75 mm in total length was 69 per 100 meters (95% confidence interval: +/- 17.3), and for brook trout it was 71 per 100 meters (95% confidence interval: +/- 8.3).

Table 19. Electrofishing data collected on Norton Creek in 2017. Data includes fish from all electrofishing passes (two).

Section	Species	Total Number of Fish Captured	Number of Fish > 75mm Captured	Mean Length (mm) All Fish	Length Range (mm) All Fish	Species Composition for Fish > 75 mm (%)
Lower (4)	WCT	67	58	122	46-221	46
	EB	79	66	124	53-214	54

Browns Gulch Drainage

Flume Gulch

Fish population surveys were completed at three sites on Flume Gulch during the summer of 2018. The sites were located at RM 0.3, 1.0 and 2.1. All sites were previously sampled in 2009 (Lindstrom 2011) and 2012 (Lindstrom 2013). Table 20 contains a summary of data collected in 2018. Westslope cutthroat trout and/or brook trout comprised the entire fish community at all sites, with brook trout making up the bulk of the fish in the stream. Cutthroat appeared to be most common in the lower extent of the drainage. At RM 0.3, the estimate for brook trout greater than 75 mm in length was 53 per 100 meters (95% confidence interval: +/- 6.0), and for cutthroat it was 18 per 100 meters (95% confidence interval: +/- 1.6). At RM 1.0, the density of both brook trout and cutthroat trout was relatively low. The estimate for brook trout greater than 75 mm in length was 12 per 100 meters (95% confidence interval: +/- 0.6), and for cutthroat it was 7 per 100 meters (95% confidence interval: +/- 0.8). At RM 2.1, no cutthroat were observed, only low numbers of brook trout. The estimate for fish greater than 75 mm in length was 15 per 100 meters (95% confidence interval: +/- 1.8).

When compared to previous samples from 2009 and 2012, results of the 2018 work on Flume Gulch were largely similar, especially compared to the 2009 survey. The biggest difference was the apparent absence of cutthroat trout at the uppermost sample site (RM 2.1) in 2018. While previous samples showed the presence of the species at this site, densities were always very low. Habitat immediately upstream of this site was significantly altered in 2009. A private landowner channelized approximately 2,500 feet of Flume Gulch through their property leading to a severe simplification of habitat as well as the draining of a large wet meadow. This activity not only altered habitat but also likely decreased late season flows and increased water temperature. In mid-August of 2018, when the site at RM 2.1 was surveyed, water temperature was 19.9º C, a value not considered suitable for cutthroat trout persistence.

Table 20. Electrofishing data collected at three sections of Flume Gulch in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.3	WCT	13	13	111	65-198	23
	EB	43	43	106	54-208	77
RM 1.0	WCT	6	6	112	86-157	21
	EB	23	23	109	53-198	79
RM 2.1	EB	14	14	120	73-185	100

Alaska Gulch

Fish population surveys were completed at three sites on Alaska Gulch during the summer of 2018. The sites were located at RM 1.1, 2.5 and 3.6. All sites were previously sampled in 2009 (Lindstrom 2011) and/or 2012 (Lindstrom 2013). Table 21 contains a summary of data collected in 2018. Westslope cutthroat trout and/or brook trout comprised the entire fish community at all sites, with brook trout making up the bulk of the fish in the stream. Cutthroat appeared to be most common in the lower portion of the drainage. At RM 1.1, the estimate for brook trout greater than 75 mm in length was 81 per 100 meters (95% confidence interval: +/- 9.1), and for cutthroat it was 7 per 100 meters (95% confidence interval: +/- 0). At RM 2.5, the density of both brook trout and cutthroat trout was very low. The estimate for brook trout greater than 75 mm in length was 9 per 100 meters (95% confidence interval: +/- 0.7). No cutthroat over 75 mm were captured in the reach. At RM 3.6, no cutthroat were observed, only moderate numbers of brook trout. The estimate for fish greater than 75 mm in length was 18 per 100 meters (95% confidence interval: +/- 0.5).

When compared to previous samples from 2009 and 2012, results of the 2018 work on Alaska Gulch were fairly similar. The biggest difference was the apparent absence of cutthroat trout at the uppermost sample site (RM 3.6) in 2018. While a previous sample in 2012 showed the presence of the species at this site, density was very low. The lack of cutthroat in the sample in 2018 could have been an artifact of low densities of fish throughout this segment of the drainage. It may also be that competition from brook trout lead to a retraction of habitat occupied by cutthroat in Alaska Gulch.

Table 21. Electrofishing data collected at three sections of Alaska Gulch in 2018. Data presented is for trout from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.1	WCT	7	7	123	77-181	10
	EB	61	61	121	58-201	90
RM 2.5	WCT	1	1	74	na	8
	EB	12	12	106	63-135	92
RM 3.6	EB	35	35	88	49-145	100

Basin Creek Drainage

Basin Creek

Fish population estimates were completed at four sites on upper Basin Creek in late September of 2018. The sites were located at RM 12.2, 13.1, 14.0 and 14.5. All the sites were situated near the headwaters of the drainage upstream of Basin Creek Reservoir. Except for the site at RM12.2, all of the sites were previously established locations (Lindstrom 2013, Lindstrom 2015, and Lindstrom 2017). Sampling at these sites was conducted to monitor a westslope cutthroat trout restoration project that occurred between 2005 and 2007 that consisted of the movement of genetically pure fish from downstream of a natural barrier into unoccupied habitat located above it. The goal of the project was to expand the range of the species in upper Basin Creek thereby increasing the chance of long-term persistence. The site at RM 12.2, located between lower and upper Basin Creek Reservoir, was added to further our monitoring efforts in the basin.

As expected, westslope cutthroat trout were the only fish observed at all the survey locations in 2018. Table 22 contains a summary of data collected at each site. Sampling within the relocation area (sites at RM 14.0 and 14.5) showed that westslope cutthroat trout were persisting as well as reproducing despite no young-of-the-year being observed. Similar to previous sampling events, fish density tended to be fairly low in these upper reaches. However, fish numbers were relatively high at the newly established section at RM 12.2 (between reservoirs). The estimate for fish 75 mm and larger at this site was 121 per 100 m (95% confidence interval: +/- 6.0). At RM 13.1 (above upper reservoir) fish numbers were also fairly good. The estimate for cutthroat 75 mm and larger was 59 per 100 m (95% confidence interval: +/- 4.9). Within the relocation area at RM 14.0, fish were sparse despite good looking habitat. Only a single pass was made through the survey section due to the very low numbers of fish captured (6 total). At RM 14.5, density improved a little. The estimate for cutthroat 75 mm and larger was 18 per 100 m (95% confidence interval: +/- 1.0). Unlike the site at RM 14.0 where all of the fish were

adults over 150 mm in length, we did observe several smaller fish at RM 14.5 that appeared to be approximately one year of age.

Table 22 Electrofishing data collected at three sections on upper Basin Creek in 2018. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 12.2	WCT	107	107	132	47-287	100
RM 13.1	WCT	48	48	117	40-200	100
RM 14.0	WCT	6	6	190	155-222	100
RM 14.5	WCT	16	16	120	77-157	100

Blacktail Creek Drainage

Blacktail Creek

Fish surveys were completed at three locations on Blacktail Creek in mid-July of 2017. All the sites were located in the headwaters of the watershed near RM 11.1, 11.8, and 12.5. Table 23 contains a summary of data collected. Sampling was done to examine species composition, size structure, and relative density in several sections of the stream following the construction of a number of simulated beaver dams near RM 11.8 in the summer of 2016. Each of the sections was 100 m in length and was sampled with multiple electrofishing passes to obtain population estimates for species present. Estimates were generated by species for fish 75 mm in total length and larger. Westslope cutthroat trout and brook trout were the only species present at all locations. Species composition and abundance was variable, but in general both species were found to be relatively common at all sites. At RM 11.1, the estimate for westslope cutthroat trout was 40 per 100 m (95% confidence interval: +/- 1.7), and for brook trout it was 81 per 100 m (95% confidence interval: +/- 4.5). At RM 11.8 in the location where the simulated beaver dams were constructed, the estimate for westslope cutthroat trout was 32 per 100 m (95% confidence interval: +/- 0.9), and for brook trout it was 45 per 100 m (95% confidence interval: +/- 2.9). Numerous young-of-the-year westslope cutthroat trout (n = 49), that were not included in the estimate made up much of the catch at this location. At RM 12.5, the estimate for westslope cutthroat trout was 26 per 100 m (95% confidence interval: +/- 1.4), and for brook trout it was 16 per 100 m (95% confidence interval: +/- 1.1).

Table 23. Electrofishing data collected at three sites on Blacktail Creek in 2017. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Trout Species Composition (%)
RM 11.1	WCT	39	39	115	60-200	35
	EB	74	74	110	50-183	65
RM 11.8	WCT	60	60	91	50-280	65
	EB	33	33	128	44-190	35
RM 12.5	WCT	34	34	86	40-190	72
	EB	13	13	116	70-160	18

In 2018, the same three monitoring sections (RM 11.1, 11.8 and 12.5) were sampled in upper Blacktail Creek. Table 24 contains a summary of data collected. As in previous sample years, westslope cutthroat trout and brook trout were the only species observed at all sites. At RM 11.1, the estimate for westslope cutthroat trout was 29 per 100 m (95% confidence interval: +/- 2.1), and for brook trout it was 38 per 100 m (95% confidence interval: +/- 1.8). At RM 11.8 in the location where the simulated beaver dams were constructed, the estimate for westslope cutthroat trout was 41 per 100 m (95% confidence interval: +/- 3.4), and for brook trout it was 20 per 100 m (95% confidence interval: +/- 0.2). At RM 12.5, the estimate for westslope cutthroat trout was 48 per 100 m (95% confidence interval: +/- 12.5), and for brook trout it was 30 per 100 m (95% confidence interval: +/- 1.6). Figures 3, 4, and 5 show population estimates for each site since sampling was initiated in 2016. While care should be taken about making inferences on such small data sets (i.e. only three sample years), the initial pattern shows that westslope cutthroat densities appear to be trending downward at the lowest sample site near RM 11.1 where brook trout tend to be more abundant, and upward at the middle (RM 11.8) and upper (RM 12.5) sites. Brook trout densities at all three sites have been variable and have not necessarily shown a clear pattern. Although the data set is small, it appears that the beaver dam analogs constructed in 2016 near RM 11.5 have potentially benefited cutthroat trout, or at least not negatively impacted the species. Further monitoring will be necessary to help discern whether the pattern observed in a result of the habitat modifications or some other factor(s).

Table 24. Electrofishing data collected at three sites on Blacktail Creek in 2018. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Trout Species Composition (%)
RM 11.1	WCT	25	25	122	74-210	42
	EB	35	35	137	55-202	58
RM 11.8	WCT	44	44	106	63-247	71
	EB	18	18	151	95-185	29
RM 12.5	WCT	27	106	106	53-225	55
	EB	22	110	110	80-180	45

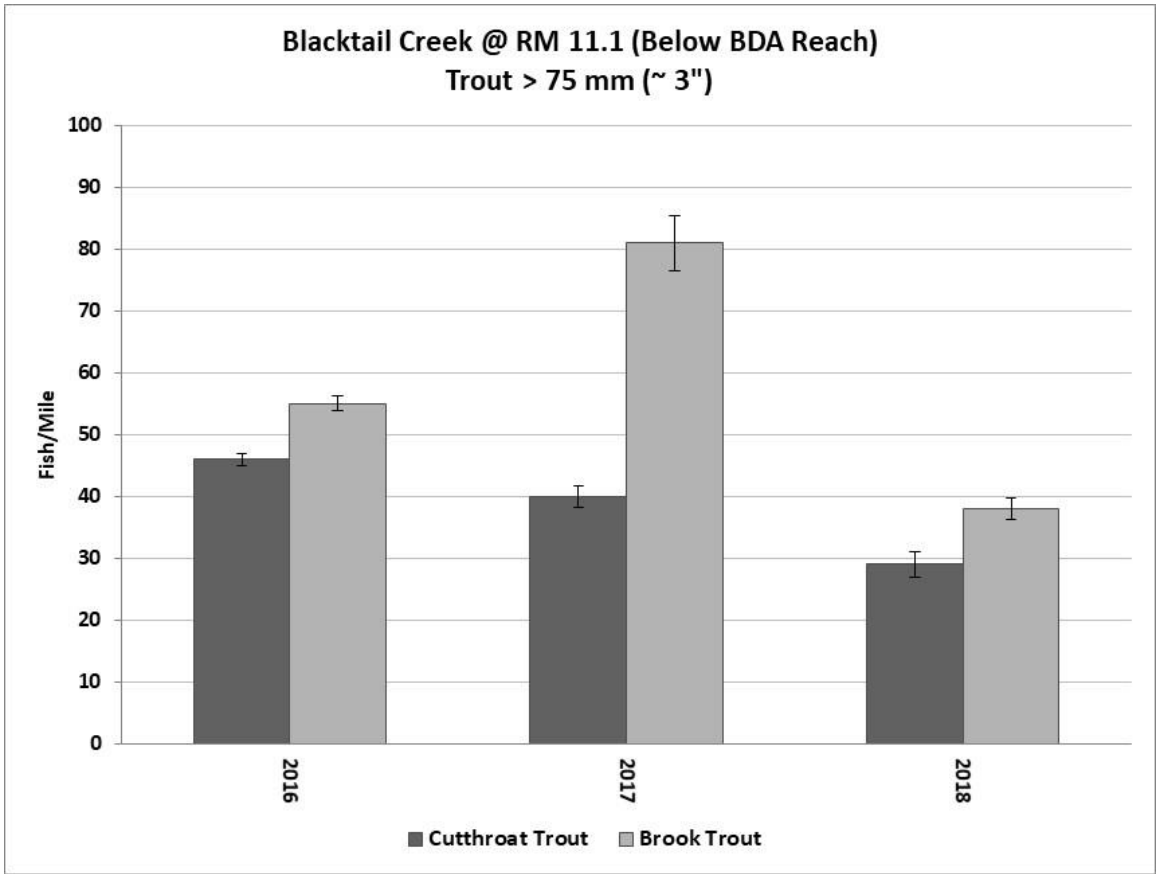

Figure 3. Depletion estimates for trout greater than 75 mm in total length collected in Blacktail Creek at RM 11.1 for the period of record. Note: 2016 sample was collected prior to beaver dam analog (BDA) construction near RM 11.8.

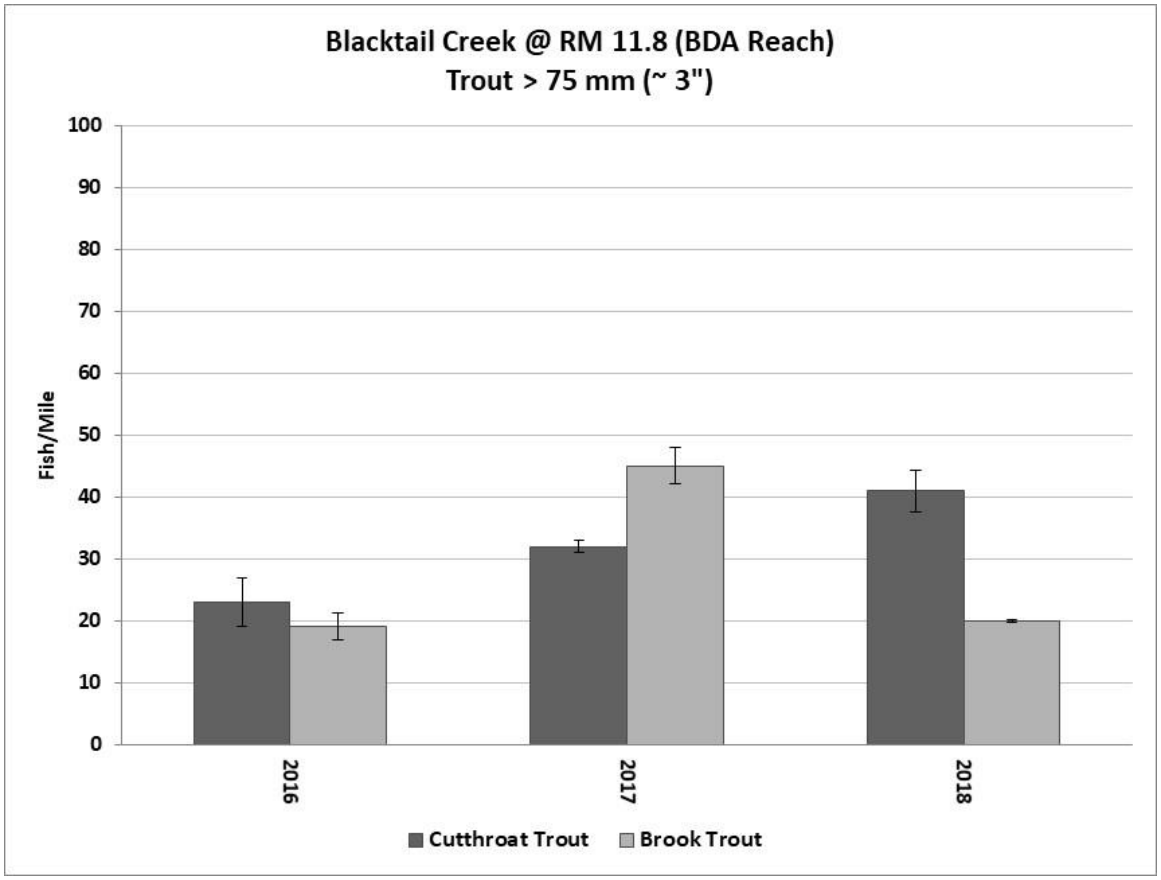

Figure 4. Depletion estimates for trout greater than 75 mm in total length collected in Blacktail Creek at RM 11.8 for the period of record. Note: 2016 sample was collected prior to beaver dam analog (BDA) construction.

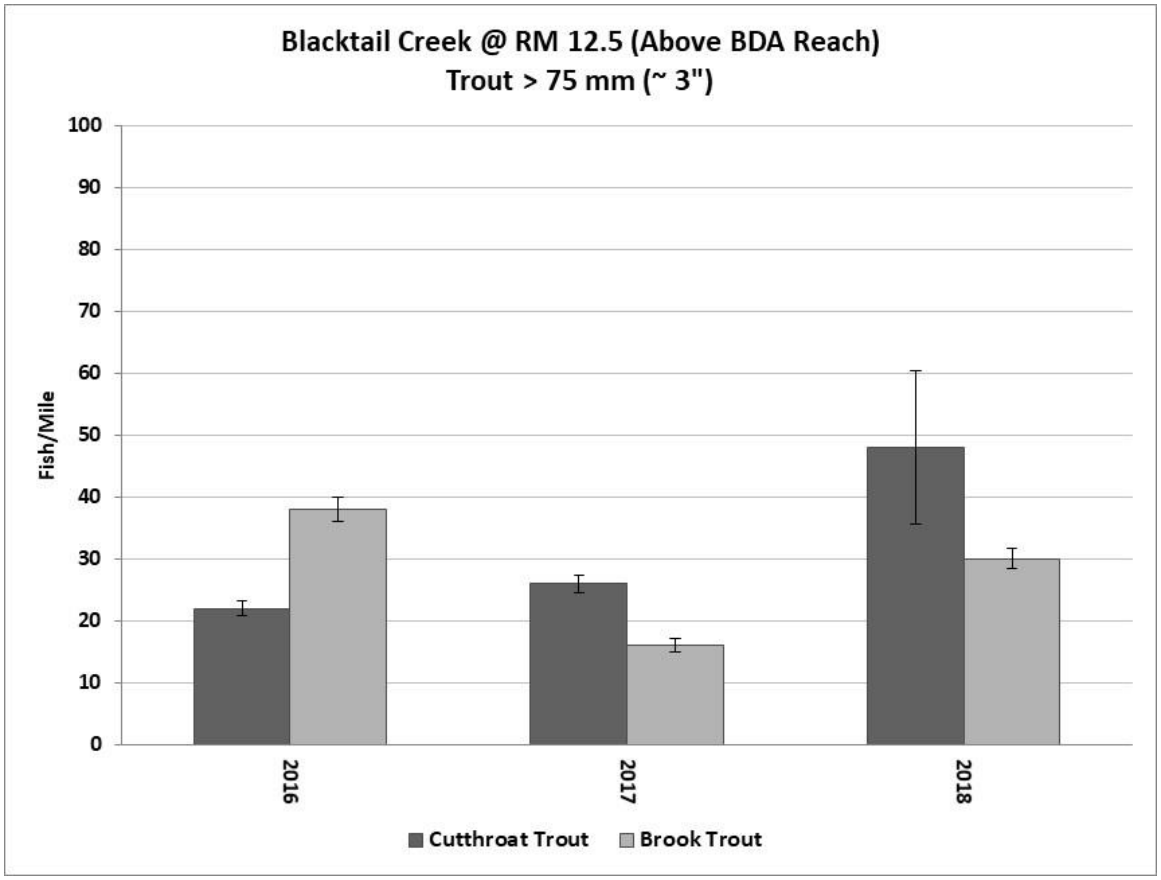

Figure 5. Depletion estimates for trout greater than 75 mm in total length collected in Blacktail Creek at RM 12.5 for the period of record. Note: 2016 sample was collected prior to beaver dam analog (BDA) construction near RM 11.8.

Unnamed Fork of Blacktail Creek near RM 11.3

A single-pass electrofishing survey was completed at one section on an unnamed fork of Blacktail Creek that joins the stream near RM 11.3 (left bank) in mid-July of 2017. The sample reach was located about 1.3 km upstream of the mouth on private land. This location was the site where several beaver dam mimics were constructed during the summer of 2016. The sample section was approximately 190 m in length and had very low flow at the time of the survey. This segment of stream has been observed to dry up during low flow periods. When this section was sampled in 2016, westslope cutthroat trout were the only fish collected in the sample reach, but densities were very low. During the 2017 sample, densities appeared slightly higher, but in addition to westslope cutthroat trout, brook trout were also found to be present. Table 25 contains a summary of data collected at the site.

Table 25. Electrofishing data collected at one section of an unnamed fork of Blacktail Creek near RM 11.3 in 2017.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Brewer Property	WCT	11	5.8	140	120-200	58
	EB	8	4.2	132	120-147	42

In 2018, the same sample reach was surveyed on the unnamed fork of Blacktail Creek near RM 11.3. Similar to past years, only a single electrofishing pass was made through the reach. Table 26 contains a summary of data collected. Only westslope cutthroat trout were captured in 2018. Additionally, the total number of fish captured was the highest recorded to date. Flows in 2018 were well above average throughout all of the upper Clark Fork Basin and could have possibly been a significant factor in what was observed during this sample year. While it is possible that the beaver dam analogs constructed in 2016 have also benefited the cutthroat population in this small stream, it is still too early to say with such a limited data set. Further monitoring of fish and flows in this area is warranted.

Table 26. Electrofishing data collected at one section of an unnamed fork of Blacktail Creek near RM 11.3 in 2018.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Brewer Property	WCT	28	14.7	152	110-222	100

Little Blacktail Creek

A single-pass electrofishing survey was completed at one section on Little Blacktail Creek in early November 2018. The site was located on private land in the upper portion of the drainage near RM 3.0. Table 27 contains a summary of data collected. Only westslope cutthroat trout were observed in the sample reach, and fish occurred in moderate density. Multiple age classes of fish were collected including young-of-the-year as well as larger adults. Habitat and flow were good in the reach at the time of the survey.

Table 27. Electrofishing data collected at one section of Little Blacktail Creek in 2018.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 3.0	WCT	27	27	96	39-150	100

Racetrack Creek Drainage

Little Racetrack Lake

Little Racetrack Lake is a 6.6 acre mountain lake in the headwaters of the Racetrack Creek Drainage. The lake was initially planted with rainbow trout in 1947, and then not again until 1997 when westslope cutthroat trout were first stocked. The lake was gillnetted in 1990, and both rainbow trout and cutthroat trout were reported in the survey. The presence of cutthroat trout suggests that the lake may have also had a wild fish component, or they could have been stocked in an unreported plant. Since 1997, the lake has been stocked approximately every three years with roughly 300 westslope cutthroat trout fry. No additional gillnetting has been done since the 1990 survey. In September of 2018 we visited the lake with angling gear to assess how the lake fished. During the survey, one person angled while the other collected depth measurements throughout the lake from a float tube. The person angling worked around the entire lake perimeter using a spinning rod with spinners and a casting bobber and fly rig. A total of one westslope cutthroat trout (350 mm, 515 g) was captured in approximately one and half hours of fishing. Fishing conditions were difficult due to a large hatch of flying ants covering the lake surface that the fish were selectively feeding on. Despite the low catch, numerous raises were observed while we were at the lake. A return visit was made approximately one week later. During this trip a single angler fished approximately three hours using the same gear as in the first survey. Two westslope cutthroat trout (410 mm, 567 g and 338 mm, 472 g) were captured during this effort. A major weather change had occurred the night before the visit, including the first significant snowfall event of the season. It is possible this weather shift affected catch rates. Gillnetting will likely be used within the next one to two years to sample the lake to get a better understanding of this fishery.

Racetrack Pond

Racetrack Pond is a 35-acre pond located near Racetrack, Montana that was transferred into public ownership in approximately 2010. At this time, gillnet sampling was completed to identify what species were present in the pond prior to beginning any supplemental trout stocking (Lindstrom 2010). This initial sampling discovered that largescale suckers were common and were the most abundant fish in the pond. Other species found to be present (in order of abundance in the nets) included yellow perch, mountain whitefish, and brown trout. While mountain whitefish and brown trout are common in the Clark Fork River (which Racetrack Pond flows into), yellow perch likely became established because of an illegal introduction. FWP began stocking Racetrack Pond with catchable size westslope cutthroat trout and sterile rainbow trout in 2012 (five

hundred of each species are stocked into the pond annually). Gillnet sampling was repeated in 2013 to see how stocked fish were faring. Only four rainbow trout and no cutthroat trout were captured during this sampling indicating that planted fish likely had limited survival or were perhaps moving out of the pond via the outflow. Regulations on Racetrack Pond are relatively restrictive and only allow harvest of stocked fish to those 14 years of age and younger. The 2013 sampling showed that largescale suckers continued to be rather common, and yellow perch continued to be present in similar numbers to 2010.

Due to a need for alluvial material for remediation activities being conducted upstream of Racetrack Pond on Phase 6 of the Clark Fork River cleanup, the Department of Environmental Quality began gravel mining to the north of Racetrack Pond in 2016. This activity essentially enlarged the pond area by around 20 acres. During the mining activity it was necessary to pump the pond down to lower the groundwater table. The pond went into the winter of 2016-2017 with a low residual pool, and winterkill seemed to be a possibility given that the pond is relatively shallow and only has a maximum depth of around 12 feet. Fish sampling was conducted in late June of 2017 and consisted of setting two 125' by 4' experimental gillnets overnight (like previous sampling events). The first net was set on the east side of the pond while the second net was set on the west side. Table 28 contains a summary of all fish captured. Like past sampling, largescale suckers were shown to be the most common fish in the pond, although numbers did appear less than what was observed in 2010 and 2013. Stocked fish (rainbow trout and westslope cutthroat trout) appeared to be rare. Brown trout were present but not very abundant, and all individuals captured were relatively large. The most interesting finding was that no yellow perch were captured. While the status of this species remains unknown, it is unlikely that the low water conditions during the 2016-2017 winter led to complete mortality. However, it is possible that the population was greatly reduced.

Table 28. Gillnet data collected from Racetrack Pond in 2017. A total of two gillnets were set. Species abbreviations are as follows: RB=Rainbow Trout, WCT=Westslope Cutthroat Trout, LL=Brown Trout, MWF=Mountain Whitefish, LSSU=Largescale Sucker, and YP=Yellow Perch.

Year	Species	Total Number of Fish Captured	Mean Fish per Net	Mean Length (mm)	Length Range (mm)
2017	RB	2	1	303	295-310
	WCT	-	-	-	-
	LL	6	3	557	440-610
	MWF	10	5	225	204-304
	LSSU	23	11.5	506	468-552
	YP	-	-	-	-

In early 2018 Racetrack Pond was again lowered to carry out a pond habitat improvement project coordinated between the Natural Resource Damage Program and FWP. Specific

objectives of project were to connect the alluvium pond on the north side to the main pond, deepen the main pond in two areas to provide for better trout habitat, construct a new screened outlet channel, and reduce the steepness of the banks around the entire pond perimeter to allow for safer access as well as better vegetation establishment. To carry out this work, the pond was dewatered extensively for most of the spring and summer of 2018. One of the hopes of the dewatering was that all the non-game (primarily suckers) and illegally introduced species (yellow perch) would be able to be removed. However, this proved to not be possible. Despite the drying of almost the entire pond with numerous pumps, the pond was unable to be completely dewatered due to the constant influx of ground water. In order for the pumps to continue to operate a small area of less than a quarter acre remained inundated. Hundreds if not thousands of suckers were observed in this area in addition to a handful of trout (primarily rainbow and brown). Attempts to mechanically remove these fish proved unsuccessful. While the drawdown likely reduced the pre-project fish numbers significantly, a total removal was not achieved as hoped. During mechanical removal attempts, no perch were encountered. However, at least two adult perch were found dead on the pump screens during the dewatering process. Following completion of the earthwork, the pumps were removed, and the pond began filling very quickly. Once the pond was full by late summer, 250 catchable westslope cutthroat trout as well as 250 catchable rainbow trout (sterile triploids) were stocked into the pond. Additionally, several thousand cutthroat and rainbow fingerlings were stocked into the pond in the fall. To assist future stocking plans, Racetrack Pond will be gillnetted in the next one to two years.

Warm Springs Creek Drainage

Upper Nelson Basin Lake

Upper Nelson Basin Lake (the lake is not officially named) is located in the head waters of the Nelson Creek Drainage at 46.106 N, 113.172 W. Nelson Creek is a tributary to Barker Creek. The lake is approximately 5 acres in size and is relatively shallow throughout much of its area. No known stocking or prior fish surveys were available for this lake. In 2018, an angling survey was completed in mid-August. Fishing was good using dry flies with a casting bobber and small spinners. A total of 25 westslope cutthroat trout were caught, measured for length, sampled for genetics (fin clip) and released. Total angling time was approximately 3 hours. All fish appeared to be healthy with several size classes present in the catch. The average size of fish angled was 279 mm and ranged in length from 184 to 353 mm.

Four Mile Basin Lake #4

Four Mile Basin Lake #4 is a 17-acre mountain lake in the Twin Lakes Creek drainage. The lake was stocked in 1976 and 1983 with golden trout, but a gillnet survey in 2009 found no fish in the lake. The lake was planted with 700 westslope cutthroat trout fry in 2011. An angling survey in July of 2014 found the fish to be surviving and doing well. In approximately one and half hours of fishing (one angler), a total of 16 westslope cutthroat trout were hooked with nine being successfully landed and measured. The average length of these fish was 284 mm (Range: 241-323 mm). An additional angling survey was completed in mid-August of 2018. One angler fished for approximately three and half hours at different spots around the lake. A total of 16 cutthroat were hooked with eight landed, measured and weighed. The average length of these fish was 340 mm (Range: 310-367 mm) and the average weight was 395 g (Range: 300-471 g). All fish appeared to be healthy and in good condition.

Gold Bar Lake

Gold Bar Lake is a 7.5-acre mountain lake in the headwaters of the Middle Fork of Warm Springs Creek. This lake was historically stocked with cutthroat trout (unspecified species) in 1948 and 1953. A recent report from a longtime angler suggested that fish were present in the lake until approximately 2015, after which it seems that fish disappeared. A gillnet survey was conducted in August of 2018 to confirm the angler report. Two sinking gillnets (experimental mountain lake) were set overnight to determine if fish were present. Neither net captured any fish. Additionally, no fish or fish activity (raises) was observed while we were at the lake on three different days. Electrofishing was completed in the outlet (above large cascade/falls) and inlet streams and found no fish. Columbia spotted frogs were common around the perimeter of the lake as well as in the inlet and outlet areas. In September of 2018 five hundred westslope cutthroat trout fry were stocked into the lake. A follow-up survey will be completed after two or three years to determine the success of this plant.

Warm Springs Ponds

Pond #3

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. Beginning in 2015, stocking density in Pond #3 was increased to 20,000 rainbow fingerlings per year. Stocking has consisted of two separate plants of 10,000 fish each occurring in June and September. 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.

Fish sampling in Warm Springs Pond #3 was completed in early May of 2017. Sampling consisted of setting five 125 ft-long by 6 ft-deep experimental gillnets overnight for two consecutive nights (total of 10 nets set). Sets included seven floating nets and three sinking nets. Figure 6 shows the general location of where nets were placed. Nets were set in approximately the same locations as in previous years (Lindstrom 2014). All fish captured were measured for total length and weighed if possible. Trout captured were also examined for a missing adipose fin as some fish stocked had this fin removed in the hatchery. Data was summarized by grouping the ten 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.

Species captured during the 2017 netting efforts on Warm Springs Pond #3 included rainbow trout, westslope cutthroat trout, brook trout, longnose sucker and largescale sucker. Table 29 contains a summary of all fish collected. While rainbow trout were the most common trout species present in the Pond #3 gillnet catch during 2017, density was relatively low. Despite the recent doubling of the stocking rate, these findings were like those from past sampling efforts (Lindstrom 2014). The largest rainbow trout handled was 727 mm in total length (or approximately 29 inches). This fish was unable to be weighed accurately but was more than 4,500 gm (or about 10.0 lbs). The heaviest fish we were able to weigh was 4,356 gm (or about 9.6 lbs) and was 704 mm in length (or about 27.7 inches). Since approximately 2014, fish stocked in late summer (September) had their adipose fin removed to assess whether fish planted at this time had any difference in survival than fish planted earlier in year. In 2017, a total of ten rainbow trout captured during the Pond #3 netting effort were missing their adipose fin. These late-summer planted fish made up about 24% of all rainbow trout captured. This early evidence seems to support that fish planted earlier in year may be having higher survival and recruitment into the fishery. However, given the small sample sizes we are working with, continued monitoring is needed before making a final decision on plant timing.

Westslope cutthroat trout were the next most abundant trout observed during 2017 gillnetting in Pond #3, but the species was not common (Table 29). Westslope cutthroat trout are currently stocked at a rate of 5,000 fingerlings annually. The 2015 and 2016 plants were adipose clipped to determine if fish were recruiting into the fishery. Of the five cutthroat trout captured during 2017 netting, two appeared to be from hatchery origin. It is likely the other three were wild fish that migrated into Pond #3 from populations that occupy upper Silver Bow Creek. While survival appears to be low for

stocked cutthroat trout in the Warm Springs Ponds, the fish that do survive add a unique element to the fishery. Periodic angler reports confirm this.

Only one brook trout was captured in Pond #3 during 2017 sampling. This fish was likely a migrant from upstream populations in Silver Bow Creek. No brown trout were captured in 2017. Brown trout were last stocked into Pond #3 in 2013. This plant was stopped due to very low recruitment and hatchery budget cuts.

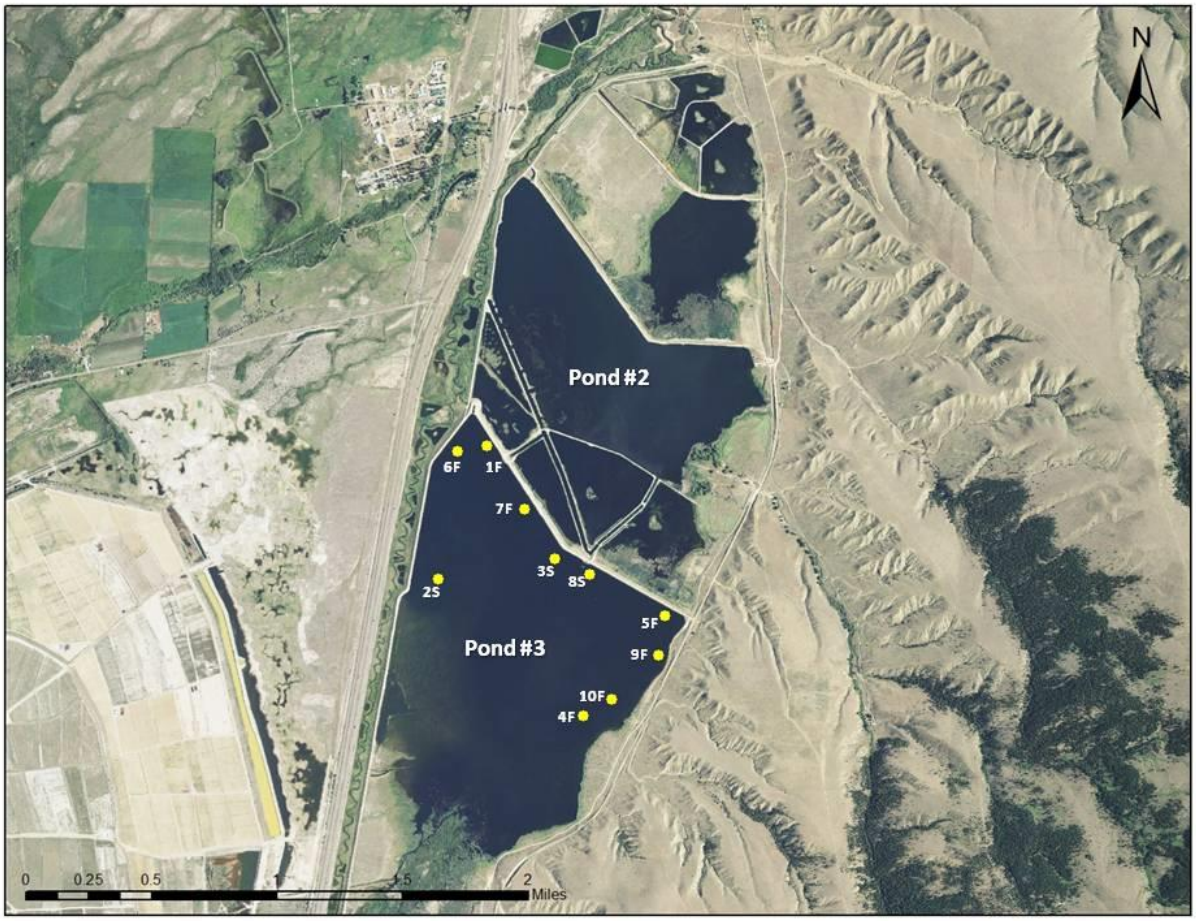

Figure 6. Map of the Warm Springs Pond System with Pond # 3 gillnet locations indicated by yellow dots. The letter after each net number indicates whether it was a floating (F) or sinking (S) net.

Table 29. Gillnet data collected from Warm Springs Pond #3 in 2017. A total of ten gillnets were set. Nets set were a combination of seven floating nets and three sinking nets. Species abbreviations are as follows: RB=Rainbow 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)
2017	RB	41*	4.1	495	273-727
	WCT	5	0.5	386	323-449
	EB	1	0.1	267	n/a
	LNSU	37	3.7	179	159-285
	LSSU	20	2.0	426	172-503

* Does not include three fish that escaped out of the net prior to being measured. One fish appeared to be approximately 400 mm in length, and two were over 500 mm in total length.

Skyline Pond

Skyline Pond, a small kid's fishing pond in Butte, Montana, was constructed in 2013. Since 2014, Montana Fish, Wildlife and Parks has stocked the pond with catchable-size westslope cutthroat trout several times each summer. In the fall of 2016 a visit to the pond found that several goldfish had been illegally introduced into the pond. Approximately three orange colored goldfish were observed swimming together during this visit. No action was taken. After receiving additional reports in 2017 of non-salmonid fish in the pond, we felt it was prudent to sample it to see what species were present. In October of 2017 the entire pond perimeter was electrofished within the vegetated shallows. Table 30 contains a summary of all fish collected. Only goldfish were captured during this sampling. It was evident that the species was reproducing in the pond as there were several age classes present, and many fish had reverted to a brown, wild coloration. All the fish captured were removed from the pond. Periodic monitoring and removal efforts will likely be needed to make sure that goldfish do not overpopulate this small pond and harm the trout fishery.

Table 30. Electrofishing data collected from Skyline Pond in 2017. A single electrofishing pass was made around the entire pond perimeter. Species abbreviations are as follows: GDF=Goldfish.

Year	Species	Total Number of Fish Captured	Mean Length (mm)	Length Range (mm)
2017	GDF	55	86	43-115

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