

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 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 another report) during the 2015 and 2016 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

2015 & 2016



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LITERATURE CITED	
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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 2015 and 2016. 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 sampling 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*. Sampling in these waters is summarized in the 2015 and 2016 Upper Clark Fork basin fisheries monitoring reports (Cook et. al 2016 and Cook et. al 2017).

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 a number of sites. Estimates used multiple-pass (typically 2 or 3) depletion methodology. Single-pass, catch-per-unit-effort (CPUE) electrofishing was also used at a number of 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 and released.

Lakes and Ponds:

The focus of lake and pond sampling was to assess species composition and general abundance in sampled waters. Experimental, monofilament gillnets were used to sample fish at all locations. 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.

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. Species abbreviations used in these tables are as follows: BULL = bull trout, EB = brook trout, EBxBULL = brook trout/bull trout hybrid, LL = brown trout, RB = rainbow trout, WCT = westslope cutthroat trout, RBxWCT = rainbow trout / westslope cutthroat trout hybrid. 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 the late summer of both 2015 and 2016. The 200 m sample section was located near RM 0.3, and was established to monitor fish response to a riparian pasture constructed in 2008. Table 1 contains a summary of results from the first electrofishing pass from each sample year. In both years, brown trout dominated the trout community at the site, with a few westslope cutthroat trout and cutthroat hybrids observed in 2015, but not in 2016. In 2015, the estimate for brown trout 75 mm and larger was 137 per 100 m (95% confidence interval: +/- 6.9). The estimate for cutthroat trout and cutthroat trout and cutthroat at trout and cutthroat trout and cutthroat trout and cutthroat trout not 95% confidence interval: +/- 7.8). In both years, fish under 100 mm heavily dominated the size structure of the population indicating the importance of this reach for brown trout spawning and rearing.

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Year	Species	Number	Fish per	Mean	Length	Species
		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
2015	WCT	4	2	328	252-391	2
	RBxWCT	1	0.5	228	na	1
	LL	168	84	135	67-470	97
2016	LL	298	149	126	65-415	100

Table 1. Electrofishing data collected at one section of Gold Creek in 2015 and 2016. Data presented is from the first electrofishing pass.

Little Blackfoot River Drainage

Meade Creek

Fish surveys were completed at three locations on Meade Creek in mid-June of 2016. The sites were located at RM 1.3, 1.6 and 3.8. The site at RM 1.3 was situated downstream of an unpermitted reservoir constructed in 2013. The remaining two sites were located upstream of the impoundment. Surveys consisted of basic single-pass, presence/absence electrofishing with no measured section lengths. Westslope cutthroat trout were the only species observed at all of the sites. Table 2 contains a summary of results from each sample location.

Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish Captured	100 m	Length (mm)	Range	Composition
		Captureu	(CIUE)	(mm)	(mm)	(70)
RM 1.3	WCT	2	na	156	112-200	100
RM 1.6	WCT	13	na	100	74-134	100
RM 3.8	WCT	6	na	129	119-136	100

Table 2. Electrofishing data collected at three locations on Meade Creek in 2016.

Spotted Dog WMA Stream Crossing Inventory and Related Fish Sampling

During the summer of 2015, an inventory of stream crossings on the Spotted Dog Wildlife Management Area (WMA) was completed. While most of the identified crossings were on tributaries situated in the Little Blackfoot River drainage, some were also located on streams on the west side of the WMA that drain to the Clark Fork River (O'Neill Creek, Jake Creek, and Fred Burr Creek). This inventory was done to guide future management decisions relative to fish passage improvement on the WMA. The assessment consisted of driving most of the roads on the WMA and documenting each crossing. Crossings were identified by type (ford, culvert, bridge, etc), measured and photographed. A GPS coordinate was collected at each site. Fish sampling was also conducted below and above a number of the sites to better understand fish presence and species composition where little or no information existed. These data are summarized below. In total, 60 crossings were identified on the WMA. Most of these crossings (53) were on FWP owned lands, with seven on lands owned by the Department of Natural Resources and Conservation (DNRC). Culverts represented the bulk of the crossings observed with 44 identified. Many of the culverts inspected were perched, undersized, and/or lacked stream bed material in the bottom of the pipe. Other crossings observed on the WMA included two bridges, 11 fords, and three former crossings that had been removed and were no longer functional. These data in concert with electrofishing data will continue to be analyzed to guide and prioritize fish passage and habitat improvement on the WMA.

Tributary to Spotted Dog Creek near RM 5.8 (at Spotted Dog Reservoir)

Fish surveys were completed at three locations on a small tributary to Spotted Dog Creek near RM 5.8 at Spotted Dog Reservoir in late May and early June of 2016. The sites were located below and above the culvert crossing not far from the stream mouth near RM 0.3, and farther upstream near the private land boundary (RM 0.6). The culvert near RM 0.3 was perched about eight inches at the outlet, and appeared to be a formidable upstream movement impediment to most fish. Westslope cutthroat trout and brook trout were the only species sampled in this small tributary, with cutthroat dominating the fish community at all sites. Table 3 contains a summary of results from each sample location.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Below Culvert RM 0.3	WCT EB	52 8	52 8	79 124	57-142 110-137	87 13
Above Culvert RM 0.3	WCT	23	23	89	72-142	100
Below Private RM0.6	WCT EB	31 3	31 3	78 118	58-149 117-119	91 9

Table 3. Electrofishing data collected at three locations on a Tributary to Spotted Dog Creek near RM 5.8 (at Spotted Dog Reservoir) in 2016.

-- Lower Fork of Tributary to Spotted Dog Creek near RM 5.8

A fish survey was completed on a very small, lower fork of the tributary to Spotted Dog Creek near RM 5.8 at Spotted Dog Reservoir in early June of 2016. This fork entered the tributary not far from the mouth (RM 0.1). Sampling consisted of electrofishing the most likely habitat between the mouth and the forested canyon about 500 m upstream. No fish were seen. However, 13 Columbia spotted frogs and one common gartersnake were observed.

-- South Fork of Tributary to Spotted Dog Creek near RM 5.8

A fish survey was completed on a significant south fork of the tributary to Spotted Dog Creek near RM 5.8 at Spotted Dog Reservoir in early June of 2016. This fork entered the tributary at approximately RM 0.5. Sampling consisted of electrofishing the most likely habitat between the mouth and the private land boundary about 500 m upstream. Westslope cutthroat trout and brook trout were the only species sampled, with cutthroat being more common. Table 4 contains a summary of results from the survey.

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Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Mouth to	WCT	18	na	94	63-141	72
Private	EB	7	na	115	106-127	28

Table 4. Electrofishing data collected on the south fork of a tributary to Spotted Dog Creek near RM 5.8 (at Spotted Dog Reservoir) in 2016.

South Fork Spotted Dog Creek

Fish surveys were completed at several sites on the South Fork of Spotted Dog Creek in August of 2015. The surveys consisted of two population estimates near RM 0.5 and 4.7, and two one-pass surveys above and below a culvert located near RM 5.2. Table 5 contains a summary of results from these surveys.

At RM 0.5, brook trout were the most common trout species in the section, with westslope cutthroat trout also rather numerous. Longnose suckers were found to be rather common in this reach of the South Fork as well, with 38 captured on the first electrofishing pass (mean length; 101 mm, length range: 76-206 mm). The population estimate for westslope cutthroat trout 75 mm and larger at RM 0.5 was 25 per 100 m (95% confidence interval: +/- 0.9), and for brook trout it was 66 per 100 m (95% confidence interval: +/- 9.5).

The site near RM 4.7 was situated downstream of a culvert crossing. Westslope cutthroat trout and brook trout were the only species observed in the reach with cutthroat being more common. Numerous young-of-the-year cutthroats were noted in the section. The population estimate for westslope cutthroat trout 75 mm and larger at RM 4.7 was 108 per 100 m (95% confidence interval: +/- 7.5), and for brook trout it was only 3 per 100 m (95% confidence interval: +/- 0).

Below the culvert near RM 5.2, westslope cutthroat trout and brook trout were the only species observed in the South Fork of Spotted Dog Creek. The species occurred in roughly equal densities at this location in the drainage.

Upstream of the culvert near RM 5.2, both cutthroat and brook trout continued to be present, but while cutthroat were fairly common, brook trout were rare with only two individuals captured in the survey reach. The culvert near RM 5.2 is perched approximately 20" and likely is a formidable impediment to upstream movement.

Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 0.5	WCT	29	29	98	47-160	41
	EB	42	42	109	63-272	59
RM 4.7	WCT	107	107	84	36-126	88
	EB	15	15	70	51-128	12
RM 5.2	WCT	22	22	80	66-93	52
Below	EB	20	20	90	47-147	48
Culvert						
RM 5.2	WCT	34	34	79	55-102	94
Above	EB	2	2	125	106-144	6
Culvert						

Table 5. Electrofishing data collected at four locations on the South Fork of Spotted Dog Creek in 2015. Data presented is from the first electrofishing pass in locations where multiple passes were made.

-- Tributary to South Fork Spotted Dog Creek near RM 0.3

Several one-pass fish surveys were completed on a tributary to the South Fork of Spotted Dog Creek near RM 0.3 in mid-August of 2015. Sampling consisted of electrofishing two 100 m sections above and below a culvert crossing located near RM 0.6, as well as surveying an additional 100 m section farther up in the drainage near RM 1.6. The total length of the drainage appeared to by approximately 3 miles. Table 6 contains a summary of results from the surveys that were completed in this tributary in 2015. Westslope cutthroat trout and brook trout were found at all sample sites. Cutthroat trout appeared to be more abundant than brook trout above and below the culvert near RM 0.6, but farther up in the drainage brook trout became more common. The culvert near RM 0.6, which was located on private land (not part of the Spotted Dog WMA), was perched approximately 14 inches and appeared to be an upstream movement impediment to fish.

South I OIK	JI Sponed D	og Cicck lica		2015.		
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Below	WCT	37	37	89	70-131	79
Culvert	EB	10	10	84	66-162	21
RM 0.6						
Above	WCT	44	44	94	66-150	96
Culvert	EB	2	2	103	76-129	4
RM 0.6						
Upper	WCT	21	21	101	45-190	39
RM 1.6	EB	33	33	86	52-194	61

Table 6. Electrofishing data collected at three locations on an unnamed tributary to the South Fork of Spotted Dog Creek near RM 0.3 in 2015.

-- Tributary to South Fork Spotted Dog Creek near RM 1.3

A fish survey was completed on a tributary to the South Fork of Spotted Dog Creek near RM 1.3 in early June of 2016. Sampling consisted of electrofishing an approximately 200 m section upstream of the culvert located very near the mouth of the stream. This culvert was perched about 12 inches and water spilled onto large rock providing limited if any upstream fish passage. Westslope cutthroat trout were the only species found in the section upstream of the crossing. Table 7 contains a summary of results from the survey. In addition to this sample we also electrofished the pool immediately below the culvert. We observed several small brook trout (<100 mm) and one large cutthroat trout (305 mm) at this location. We continued up the drainage to the headwaters approximately one mile upstream spot checking for fish as we went. We observed only cutthroat trout throughout the stream all the way to where flow went away (Near RM 1.2). It is likely that the culvert near the mouth of this stream is a complete barrier to upstream fish passage given the absence of brook trout in most of the stream.

Creek near i	KM 3.8 III 20	10.				
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Above	WCT	16	8	93	51-138	100
Culvert						
Near						
Mouth						

Table 7. Electrofishing data collected on a tributary to the South Fork of Spotted Dog Creek near RM 5.8 in 2016.

-- West Fork Spotted Dog Creek

The West Fork of Spotted Dog Creek is an approximately two-mile long drainage that joins the South Fork of Spotted Dog Creek near RM 3.1. One single-pass fish survey was completed on the West Fork near RM 0.5 in mid August of 2015. Table 8 contains a summary of results from the survey. Brook trout were found to be fairly common in the section sampled, with multiple ages classes present including young-of-the-year and larger adults. Westslope cutthroat trout were also present, but were not overly abundant. Additionally, the cutthroats captured were older individuals. The lack of young-of-the-year and small juveniles suggested limited survival and recruitment for the species in the West Fork of Spotted Dog Creek.

Table 8. Ele	ctrofishing da	ata collected	on the West	Fork of Spo	tted Dog Cree	ek near RM
0.5 in 2015.						
Section	Species	Number	Fish per	Mean	Length	Species

Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 0.5	WCT	3	3	136	126-150	8
	EB	34	34	120	52-230	92

-- Tributary to South Fork Spotted Dog Creek near RM 4.6

A single-pass fish survey was completed on a tributary to the South Fork of Spotted Dog Creek near RM 4.6 in early August of 2015. Sampling consisted of electrofishing a 100 m section upstream of a culvert located on the stream between RM 0.1 and 0.2. This culvert was perched about three inches at the outlet and likely provided for partial upstream fish passage for larger individuals at the time of the survey. Westslope cutthroat trout and brook trout were both found in the sample section with cutthroat being most abundant. Multiple age classes of both species were present in the reach with a number of juveniles including young-of-the-year observed. Table 9 contains a more detailed summary of results from the survey.

FOLK OF SPO	lied Dog Cle	ek near Kivi 4	.0 III 2013.			
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 0.2	WCT	45	45	83	57-159	76
	EB	14	14	73	42-125	24

Table 9. Electrofishing data collected at one site on an unnamed tributary to the South Fork of Spotted Dog Creek near RM 4.6 in 2015.

---- East Fork of Tributary to South Fork Spotted Dog Creek near RM 4.6

Several one-pass fish surveys were completed on the east fork of the tributary to the South Fork of Spotted Dog Creek near RM 4.6 in early August of 2015. This small drainage was about 1.5 miles in length. Sampling consisted of electrofishing multiple locations on the stream that were above and below three identified culverts. Table 10 contains a summary of results from the surveys that were completed. All three of the culverts observed during the surveys were perched at the outlet and appeared to present a partial to complete barrier to upstream fish movement. Drop height varied from approximately 3 to 12 inches with the lowest culvert having the greatest amount of drop. Westslope cutthroat trout and brook trout were found in relatively low densities between the lower and middle culvert in the drainage, while only brook trout were observed below the uppermost culvert that was identified. Sampling upstream of this culvert found no fish.

		1	U			
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Below 2 nd	WCT	9	-	76	70-85	39
Culvert	EB	14	-	113	90-154	61
(RM 0.5)						
Below 3 rd Culvert (RM 0.8)	EB	12	-	109	87-139	100
Above 3 rd Culvert (RM 1.0)	No Fish	-	-	-	-	-

Table 10. Electrofishing data collected at three locations on the east fork of an unnamed tributary to the South Fork of Spotted Dog Creek near RM 4.6 in 2015.

---- West Fork of Tributary to South Fork Spotted Dog Creek near RM 4.6

Several one-pass fish surveys were completed on the west fork of the tributary to the South Fork of Spotted Dog Creek near RM 4.6 in early August of 2015. This small drainage was about 1 mile in length. Sampling consisted of electrofishing several locations on the stream that were above and below two identified culverts. Table 11 contains a summary of results from the surveys that were completed. Both of the culverts observed during the surveys were perched at the outlet and appeared to present a partial to complete barrier to upstream fish movement. Drop height varied from approximately 1 to 20 inches with the lowest culvert (1st culvert) having the greatest amount of drop. Westslope cutthroat trout and brook trout were found in relatively low densities at all sample locations. The most upstream culvert (2nd culvert) appeared to be near the upper end of fish distribution in this small drainage.

tributary to the South Fork of Spotted Dog Creek hear RM 4.0 In 2015.						
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Below 1 st	WCT	13	13	74	59-87	72
Culvert	EB	5	5	88	51-157	28
(RM 0.3)						
Below 2 nd	WCT	8	8	86	70-95	89
Culvert	EB	1	1	110	-	11
(RM 0.7)						
Above 2 nd	WCT	1	-	~60	-	50
Culvert	EB	1	-	~60	-	50
(RM 0.8)						

Table 11. Electrofishing data collected at three locations on the west fork of an unnamed tributary to the South Fork of Spotted Dog Creek near RM 4.6 in 2015.

Middle Fork Spotted Dog Creek

Fish surveys were completed at several sites on the Middle Fork of Spotted Dog Creek in July of 2015. The surveys consisted of three population estimates near RM 2.4, 3.2 and 3.6, and two one-pass surveys near RM 2.2 and in the upper portion of the drainage near RM 3.9. All of the sampling was done in relation to three culvert crossings identified near RM 2.2, 2.6, and 3.2. None of the culverts were perched at the time of the survey, but little to no streambed material was present in the pipes. Upstream fish passage seemed likely for larger age classes at all of the locations. Westslope cutthroat trout dominated the catch at all of the sample sites, with many of the fish captured being smaller juveniles. While brook trout were also present throughout the drainage, the species tended to be rare or absent at the sites sampled. Table 12 contains a more detailed summary of the fish survey results from 2015.

At RM 2.2, the population estimate for westslope cutthroat trout 75 mm and larger was 35 per 100 m (95% confidence interval: $\pm/-5.5$). No estimate was made for brook trout at this site as only one individual less than 75 mm in length was captured. AT RM 3.2, the population estimate for westslope cutthroat trout 75 mm and larger was 20 per 100 m (95% confidence interval: $\pm/-0.5$). No brook trout were captured at this site in 2015. At RM 3.6, the population estimate for westslope cutthroat trout 75 mm and larger was 6 per 100 m (95% confidence interval: $\pm/-0.9$), and for brook trout it was 3 per 100 m (95% confidence interval: $\pm/-0.9$).

Section Name	Species	Number of Fish	Fish per 100 m	Mean Length	Length Range	Species Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Below 1st	WCT	15	-	83	62-145	94
Culvert (RM 2.2)	EB	1	-	45	-	6
Below 2 nd	WCT	52	52	73	30-108	98
Culvert (RM 2.4)	EB	1	1	57	-	2
Below 3 rd Culvert (RM 3.2	WCT	37	37	73	30-96	100
Above 3 rd	WCT	19	19	70	60-80	86
Culvert (RM 3.6)	EB	3	3	137	112-160	14
RM 3.9	WCT	14	-	72	52-99	87.5
	EB	2	-	108	42-174	12.5

Table 12. Electrofishing data collected at several locations on the Middle Fork of Spotted Dog Creek in 2015. Data presented is from the first electrofishing pass in locations where multiple passes were made.

Trout Creek

Fish surveys were completed at two sites on Trout Creek in mid August of 2015. The surveys consisted of a single electrofishing pass completed through the best habitats downstream and upstream of a culvert located near RM 10.7. This culvert was slightly perched (approximately 2 inches) at the time of the survey, and likely allowed for at least partial upstream fish passage. Westslope cutthroat trout were present both below and above the culvert, and were the only species observed in this portion of Trout Creek. Table 13 contains a summary of survey results.

Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Below	WCT	33	-	93	43-155	100
Culvert						
(RM 10.7)						
Above	WCT	8	-	147	105-182	100
Culvert						
(RM 10.9)						

Table 13. Electrofishing data collected at two locations on Trout Creek in 2015.

-- Tributary to Trout Creek near RM 8.4

Fish surveys were completed on a tributary to Trout Creek near RM 8.4 in mid-August of 2015. The surveys consisted of a population estimate completed downstream of a culvert located near RM 1.4, as well as a single pass survey completed just upstream of the same culvert. At the time of the survey, the culvert was not perched, but was set high at the inlet causing channel aggradation and localized flooding over the road during high water events. The culvert appeared to allow for upstream passage by most fish. Westslope cutthroat trout were present both below and above the culvert, and were the only species observed in this portion of the tributary. Below the culvert near RM 1.3, the population estimate for westslope cutthroat trout 75 mm and larger was 55 per 100 m (95% confidence interval: +/- 4.7). Table 14 contains a summary of results from the surveys completed in 2015.

Table 14. Electrofishing data collected at two locations on Trout Creek in 2015. Data presented is from the first electrofishing pass in locations 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 Culvert (RM 1.3)	WCT	46	46	102	46-190	100
Above Culvert (RM 1.4)	WCT	30	30	97	40-153	100

-- Tributary to Trout Creek near RM 9.4

A fish survey was completed on a small tributary to Trout Creek near RM 9.4 in mid- June of 2016. Sampling consisted of electrofishing the most likely habitat in an approximately 200 m reach below a culvert crossing (46.50327 N, 112.49776 W). No fish were observed.

-- Tributary to West Fork of Trout Creek

A fish survey was completed on a small tributary to the West Fork of Trout Creek in mid- June of 2016. Sampling consisted of electrofishing the most likely habitat in an approximately 200 m reach below a culvert crossing (46.48638 N, 112.48710 W). No fish were observed.

Spotted Dog Creek

A population estimate was completed at one site on Spotted Dog Creek in mid-September of 2016. The 100 m sample section was located on the Spotted Dog WMA near RM 7.9, just upstream of the Pauly homestead. This section was established to monitor fish response to planned channel restoration in the reach. The section was first sampled in 2011 with a single pass survey aimed at determining species presence and relative abundance (Lindstrom 2013). In this survey, brook trout (many being young juveniles) were found to dominate the fish community in the reach. The survey completed in 2016 showed similar findings. Brook trout comprised over 80% of the fish in the reach, with westslope cutthroat trout being the only other trout species present. Similar to the 2011 survey, many of the brook trout captured in 2016 were young juveniles. Table 15 contains a summary of results from the first electrofishing pass of the three-pass survey. Longnose sucker were also observed in this reach of Spotted Dog Creek, but the species was not overly abundant (11 captured in three electrofishing passes). The population estimate for westslope cutthroat trout 75 mm and larger was 33 per 100 m (95% confidence interval: +/-0.6), and the estimate for brook trout of the same size category was 94 per 100 m (95% confidence interval: +/- 1.7).

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Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 7.9	WCT EB	36 166	36 166	112 80	52-204 46-225	18 82
		100	100	88		8

Table 15. Electrofishing data collected at one section on Spotted Dog Creek in 2016. Data presented is from the first electrofishing pass.

Snowshoe Spring Creek

A depletion survey was completed at one site on Snowshoe Spring Creek in early September of 2015. The 100 m sample section was located on state land near RM 1.1. This location was just downstream of the spring source. The fish community was comprised almost entirely of brown trout except for a single individual that appeared to be a hybrid between a brown trout and a brook trout (tiger trout: LLxEB). Table 16 contains a summary of results from the first electrofishing pass of the two-pass survey. The estimate for brown trout 75 mm and larger was 22 per 100 m (95% confidence interval: +/- 0.9).

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Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 1.1	LL	20	20	219	142-280	95
	LLxEB	1	1	157	na	5

Table 16. Electrofishing data collected at one section on Snowshoe Spring Creek in 2015. Data presented is from the first electrofishing pass.

Ontario Creek

Several single-pass fish surveys were completed on Ontario Creek during the summer of 2016 with the specific purpose of detecting the presence of bull trout. Environmental DNA work completed by the USFS Rocky Mountain Research Station in the Little Blackfoot Drainage in 2015 showed positive detections in Ontario Creek despite various electrofishing surveys over the last decade not detecting any individuals. The 2016 electrofishing surveys focused more on areas where the detections were located. Specific reaches sampled were from RM 0.0 to RM 0.4, RM 1.4 to RM 1.8, and RM 2.2 to RM 2.5. The surveys focused on likely habitats where experience in other bull trout systems found the species to be present. No bull trout were observed during any of the surveys. Brook trout, westslope cutthroat trout, brown trout, mountain whitefish, and sculpin were all found to be fairly common at the sites, though none were collected or measured.

Little Blackfoot River

Several single-pass fish surveys were completed on the Little Blackfoot River during the summer of 2016 with the specific purpose of detecting the presence of bull trout. Environmental DNA work completed by the USFS Rocky Mountain Research Station in the Little Blackfoot Drainage in 2015 showed positive detections in the Little Blackfoot River upstream of Ontario Creek despite various electrofishing surveys over the last decade not detecting any individuals. The 2016 electrofishing surveys focused more on areas where the detections were located. Specific reaches sampled were from RM 35.0 to RM 35.2, RM 37.4 to RM 37.5, and RM 39.4 to RM 40.2. The surveys focused on likely habitats where experience in other bull trout systems found the species to be present. No

bull trout were observed during any of the surveys. However, at the uppermost reach one 175 mm brook trout that had characteristics of a bull trout - brook trout hybrid was captured. A genetic sample was collected from this individual, but processing of the sample had not been completed at the time this report was written. Westslope cutthroat trout, brook trout, brown trout, mountain whitefish, and sculpin were found to be present at all of the sites sampled, though none were collected or measured.

O'Neill Creek Drainage

O'Neill Creek

A depletion survey was completed at one site on O'Neill Creek in mid-September of 2015. The 100 m sample section was located near RM 1.7 on the Spotted Dog WMA. This area of the stream was first sampled in 2009 (Lindstrom 2011) and again in 2011 (Lindstrom 2013) with single pass electrofishing surveys. The original section was located at RM 1.5, but in 2015 this reach of O'Neill Creek had extensive beaver activity that precluded effective sampling. Similar to previous surveys, westslope cutthroat trout were the only fish observed in the reach, with many being young-of-the-year of which not all were captured. Table 17 contains a summary of results from the first electrofishing pass of the two-pass survey. The estimate for fish 75 mm and larger was 36 per 100 m (95% confidence interval: +/- 3.7).

Table 17. Electrofishing data collected on	O'Neill Creek in 2	2015. Data j	presented is fro	m
the first electrofishing pass.				

	01					
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 1.7	WCT	69	69	76	40-187	100

Cottonwood Creek Drainage

North Fork Cottonwood Creek

One population estimate was completed on North Fork Cottonwood Creek in late September of 2016. The 100 m sample section was located just upstream of the Spring-Emery Road crossing near RM 0.3. This section was first sampled in 2007 (Lindstrom et al. 2008) and again in 2008, and 2012 (Lindstrom 2013). In 2007, westslope cutthroat trout comprised the bulk of the trout community at the site, with brook trout present but very rare. In 2012, westslope cutthroat trout were still the most common species, but brook trout appeared to be much more common with a majority of fish captured being young juveniles approximately 1 year or less in age. The 2016 sample showed a continued expansion of brook trout in this section of North Fork Cottonwood Creek. The species comprised over 60% of the fish captured in the reach. Many of the brook trout captured were young-of-the-year. Larger fish of both species were present in roughly equal proportions. The estimate for westslope cutthroat trout 75 mm in length and greater was 48 per 100 m (95% confidence interval: +/- 3.1), and for brook trout it was 44 per 100 m (95% confidence interval: +/- 1.9). Table 18 contains a summary of data collected on North Fork Cottonwood Creek in 2016.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.3	WCT	35	35	103	40-195	36
	EB	61	61	95	60-195	64

Table 18. Electrofishing data collected at one section on North Fork Cottonwood Creek in 2016. Data presented is from the first electrofishing pass.

Middle Fork Cottonwood Creek

Fish surveys were completed on the upper reaches of Middle Fork Cottonwood Creek in early October of 2016 in an effort to determine the presence or absence of fish relative to the uppermost road culvert in the drainage (location near 46.354° N, 112.535° W). Single pass electrofishing was completed below and above this crossing. The lower site was located near RM 2.9 while the upper section was near RM 3.2. Westslope cutthroat trout were found downstream of the culvert, but no fish were captured or observed upstream of it. Just upstream of the culvert there were a number of large rock drops and cascades, many of which appeared to be barriers to upstream movement of fish. It appeared that the culvert was situated near the natural upper extent of fish distribution in the drainage. Table 19 contains a summary of data collected on Middle Fork Cottonwood Creek in 2016.

Table 19. Electrofishing data collected at two sections on Midd	lle Fork Cottonwood
Creek in 2016.	

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 2.9	WCT	13	na	122	73-173	100
RM 3.2	NO FISH	0	-	-	-	-

-- Tributary to Middle Fork Cottonwood Creek near RM 1.5

A single-pass fish survey was completed on a tributary to Middle Fork Cottonwood Creek near RM 1.5 in early October of 2016. The approximately 50 m sample site was located about 600 m upstream of the confluence with the Middle Fork. Westslope cutthroat trout were the only fish species captured in the section. Table 20 contains a summary of data collected at the site.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
600 m Upstream of Mouth	WCT	12	24	128	96-180	100

Table 20. Electrofishing data collected at one section on a tributary to Middle Fork Cottonwood Creek near RM 1.5 in 2016.

---- S.E. Fork of Tributary to Middle Fork Cottonwood Creek near RM 1.5

A single-pass fish survey was completed on the southeast fork of a tributary to Middle Fork Cottonwood Creek near RM 1.5 in early October of 2016. The sample site was located below the forest service road crossing in the upper extent of the drainage (46.33043° N, 112.55342° W). No fish were observed at this location.

---- S.W. Fork of Tributary to Middle Fork Cottonwood Creek near RM 1.5

A single-pass fish survey was completed on the southwest fork of a tributary to Middle Fork Cottonwood Creek near RM 1.5 in early October of 2016. The sample area was located above and below the forest service road crossing in the upper extent of the drainage (46.33374° N, 112.56232° W). No fish were observed in either location.

Modesty Creek Drainage

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. Shortly after the stream was reconnected to the river, we did some spot electrofishing near the top of the rechanneled reach and found a number of juvenile mountain whitefish present in several pools. Additionally, in late October we noted several brown trout redds (approximately eight) on freshly placed gravels throughout the reconstructed reach. In early May of 2016, fish surveys were completed at four sections of Modesty Creek. The sites were located near the mouth of the newly constructed channel, farther upstream near the upper extent of the reconstructed reach, along the Galen Road at the Galen AWARE campus, and in Section 36 (Township 6 N, Range 10 W) owned by the Montana Department of Natural Resources and Conservation (DNRC). Table 21 contains a summary of results for trout captured at each sample location.

Near the mouth, a multiple pass depletion estimate was attempted but extremely poor visibility from high turbidity made capture efficiency relatively poor. A total of 15 brown trout were captured in two electrofishing passes through the 400 m section. Most of the fish captured were young juveniles although none were young-of-the-year. Additional fish observed in the reach included 31 largescale suckers (length range: 41-156 mm), 13 longnose suckers (length range: 115-204 mm), and 45 redside shiners (length range: 52-110 mm).

Only a single electrofishing pass was made through the section near the upper extent of the reconstructed reach. Low fish densities and poor visibility due to high turbidity did not warrant more than a single electrofishing pass through the section. Juvenile brown trout were the only trout captured, although none were young-of-the-year. Additional fish observed included three largescale suckers (length range: 63-119 mm), three longnose suckers (length range: 117-195 mm), four redside shiners (length range: 72-109 mm), and one longnose dace (42 mm).

At the site near the Galen AWARE campus, only a single electrofishing pass was made through the section. Similar to the lower reaches of Modesty Creek we observed low densities of mostly smaller brown trout was well as five longnose suckers (length range: 90-153 mm) and two redside shiners (length range: 33-69 mm). A littler farther upstream on the DNRC property, the fish community remained similar. We found a few brown trout and two longnose suckers (length range: 95-110 mm) in the one electrofishing pass through the section.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Mouth	LL	10	2.5	134	102-173	100
Upper Rechanneled Area	LL	6	3	117	100-136	100
AWARE Campus	LL	10	4	164	113-285	100
State Land	LL	10	5	176	140-204	100

Table 21. Electrofishing data for trout collected at four sections of Modesty Creek in 2016. Data presented is from the first electrofishing pass in sections where multiple passes were made.

Warm Springs Creek Drainage

Warm Springs Creek

In both 2015 and 2016, electrofishing was conducted immediately below the Meyers Dam diversion on Warm Springs Creek in an effort to capture and pass migrating bull trout upstream. This dam occurs at approximately RM 16.6 and is believed to preclude all upstream fish passage. Only bull trout captured in these efforts were passed upstream of the dam, with all other species released back downstream of it. In 2015, electrofishing was completed on seven days between August 4th and September 17th. Three bull trout were captured and moved over the diversion as a result of these efforts. Table 22 contains a summary of all fish captured below the diversion during this period. In 2016, electrofishing was completed on seven days between July 19th and August 15th. Five bull trout were captured and moved over the diversion in this year. Table 22 contains a summary of fish captured during this period.

Year	Species	Number	Mean	Length
	Ĩ	of Fish	Length	Range
		Captured	(mm)	(mm)
2015	BULL	3	327	205-564
	EBxBULL	1	532	-
	EB	5	149	123-180
	RBxWCT	4	217	184-300
	LL	61	201	113-332
2016	BULL	5	490	423-548
	WCT	1	159	-
	RBxWCT	4	204	92-278
	LL	28	218	96-349

Table 22. Electrofishing data collected below the Meyers Dam diversion on Warm Springs Creek in 2015 and 2016.

Twin Lakes Creek

In both 2015 and 2016, 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 is believed to preclude all upstream fish passage. Only bull trout captured in these efforts were passed upstream of the dam, with all other species released back downstream of it. In 2015, electrofishing was completed on five days between August 11th and September 17th. Two bull trout were captured and moved over the diversion as a result of these efforts. Table 23 contains a summary of all fish captured below the diversion during this period. In 2016, electrofishing was completed on six days between July 19th and August 15th. Three bull trout were captured and moved over the diversion in this year. Table 23 contains a summary of fish captured during this period.

Year	Species	Number	Mean	Length
		of Fish	Length	Range
		Captured	(mm)	(mm)
2015	BULL	2	202	180-224
	EBxBULL	1	378	-
	EB	7	151	106-195
	WCT	32	148	41-221
2016	BULL	3	372	312-488

Table 23. Electrofishing data collected below the Silver Lake diversion dam on Twin Lakes Creek in 2015 and 2016. Only bull trout were targeted in 2016.

Storm Lake Creek

In both 2015 and 2016, electrofishing was conducted immediately below the Silver Lake diversion dam near the mouth of Storm Lake Creek in an effort to capture and pass migrating bull trout upstream. This dam occurs at approximately RM 0.1 and is believed to preclude all upstream fish passage. Only bull trout captured in these efforts were passed upstream of the dam, with all other species released back downstream of it. In 2015, electrofishing was completed on nine days between July 28th and September 29th. A total of 17 bull trout were captured and moved over the diversion as a result of these efforts. Table 24 contains a summary of all fish captured below the diversion during this period. In 2016, electrofishing was completed on 14 days between July 14th and September 12th. Thirty bull trout were captured and moved over the diversion in this year. Table 24 contains a summary of fish captured during this period.

Year	Species	Number	Mean	Length
		of Fish	Length	Range
		Captured	(mm)	(mm)
2015	BULL	17	465	197-589
	EBxBULL	7	446	382-544
	EB	1	386	-
	WCT	1	239	-
2016		20	400	200 500
2016	BULL	30	490	389-388
	EBxBULL	12	436	200-502
	EB	1	517	-
	WCT	2	171	158-184

Table 24. Electrofishing data collected below the Silver Lake diversion dam on Storm Lake Creek in 2015 and 2016.

Mill Creek Drainage

Mill-Willow Bypass

Fish surveys were completed at two locations on the Mill-Willow Bypass in early May of 2016. The sites were located near the mouth of the stream and below the Interstate 90 crossing several kilometers upstream. Due to low fish density only a single electrofishing pass (with tandem backpack electrofishers) was made through each site. Both sections were rather long at close to 1 km in length (lower: 1085 m, upper: 945 m). While trout were the primary fish targeted, other species were also collected at the sites. However, non-trout species were not necessarily collected in relation to their frequency observed. Table 25 contains a summary of results for all fish collected at each sample location. Brown trout comprised the bulk of the trout community, with westslope cutthroat trout present, but rare. Other species collected in the Mill-Willow Bypass in 2016 included mountain whitefish (MWF), longnose sucker (LNSU), largescale sucker (LSSU), rocky mountain sculpin (RMCOT), and central mudminnow (CMMN).

	1				1 7	
Section	Species	Number	Fish per	Mean	Length	Trout
Name		of Fish	100 m	Length	Range	Species
		Captured	(CPUE)	(mm)	(mm)	Composition
						(%)
Lower	WCT	2	0.2	110	106-113	3
	LL	57	5.3	170	38-458	97
	MWF	19	-	159	116-297	-
	LNSU	3	-	211	151-274	-
	LSSU	3	-	100	60-134	-
	RMCOT	18	-	71	39-110	-
	CMMN	5	-	107	78-135	-
Upper	LL	28	3.0	200	85-441	100
	MWF	33	-	144	95-292	-
	LNSU	3	-	204	160-262	-
	RMCOT	5	-	96	79-110	-

Table 25. Electrofishing data for fish collected at two sections of the Mill-Willow Bypass in 2016. Non-trout species were not collected in relation to their frequency observed.

Basin Creek Drainage

Basin Creek

Fish population estimates were completed at several locations on upper Basin Creek in late September of 2015 and 2016. The sites were located at RM 13.1, 14.0 and 14.5 in 2015, and at RM 14.0 and 14.5 in 2016. All of the sites were situated near the headwaters of the drainage upstream of Basin Creek Reservoir. All of the sites were previously

established locations (Lindstrom 2013 and Lindstrom 2015). 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.

As expected, westslope cutthroat trout were the only fish observed at the survey locations in both sample years. Table 26 contains a summary of data collected at sites sampled in 2015, while table 27 contains a summary of data collected in 2016. 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 any young-of-the-year being observed in either sample year. Similar to previous sampling events, fish density tended to be fairly low. In 2015, the estimate for fish 75 mm and larger at RM 13.1 was 16 per 100 m (95% confidence interval: +/- 1.7). Within the relocation area at RM 14.0, it was 21 per 100 m (95% confidence interval: +/- 1.7), and at RM 14.5 it was 12 per 100 m (95% confidence interval: +/- 1.9), and at RM 14.5 it was 12 per 100 m (95% confidence interval: +/- 1.3).

Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 13.1	WCT	19	19	106	38-221	100
RM 14.0	WCT	14	14	161	131-207	100
RM 14.5	WCT	11	11	141	100-173	100

Table 26. Electrofishing data collected at three sections on upper Basin Creek in 2015. Data presented is from the first electrofishing pass.

Table 27. Electrofishing data collected at two sections on upper Basin Creek in 2016. Data presented is from the first electrofishing pass.

1			01			
Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
RM 14.0	WCT	5	5	163	110-223	100
RM 14.5	WCT	10	10	131	90-194	100

Blacktail Creek Drainage

Blacktail Creek

Fish surveys were completed at several locations on Blacktail Creek in mid-to-late June of 2016. One site was located just upstream of the confluence with Silver Bow Creek near the Butte Visitors Center, while the others were in the headwaters of the watershed near RM 11.1, 11.8, and 12.5. Sampling near the Butte Visitors Center was completed to assess fish health immediately downstream of a semi-truck crash site that occurred on June 10, 2016, which led to an unknown amount of diesel fuel spilling into the creek along with large amounts of packaged cherries and other debris. The remaining sites in the headwaters were established to monitor the effects of simulated beaver dams planned for installation in the upper drainage. Table 28 contains a summary of data collected on Blacktail Creek in 2016.

At the semi-truck crash location, a single electrofishing pass through a 180 m section immediately downstream of the site found fish present in numbers similar to what was expected given past sampling in the area. All observable fish were collected during this sampling, which included non-trout species such as longnose sucker (LNSU) and rocky mountain sculpin (RMCOT). Only one dead fish was observed during the survey, a 360 mm brook trout (518 g) located near the top of the section just a few meters down from the crash location. During the survey, the smell of diesel fuel lofted from slow areas of the creek where woody debris had accumulated. However, it did not appear to be concentrated enough to cause wide-spread fish mortality given our observations and electrofishing findings. Water samples were collected on the day of the crash, but it was decided through consultation with the FWP pollution control biologist to not analyze the samples given the findings of the electrofishing survey.

Sampling at three sites in the headwaters of Blacktail Creek (RM 11.1, 11.8, and 12.5) was done to examine species composition and relative density in various areas of the stream prior to 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 in order to obtain population estimates of species observed. Westslope cutthroat trout and brook trout were present at all locations. Species composition and abundance was variable, but in general both species were found to be relatively common in the three sample sections. At RM 11.1, the estimate for westslope cutthroat trout 75 mm and larger was 46 per 100 m (95% confidence interval: +/- 1.0), and for brook trout it was 55 per 100 m (95% confidence interval: +/- 1.2). At RM 11.8 in the location where the simulated beaver dams were to be constructed, the estimate for westslope cutthroat trout 75 mm and larger was 23 per 100 m (95% confidence interval: +/-4.0), and for brook trout it was 19 per 100 m (95% confidence interval: +/-2.2). At RM 12.5, the estimate for westslope cutthroat trout 75 mm and larger was 22 per 100 m (95% confidence interval: +/- 1.3), and for brook trout it was 38 per 100 m (95% confidence interval: +/-1.9).

presented is nom the first electronsning pass where multiple passes were made.						
Section	Species	Number	Fish per	Mean	Length	Trout
Name		of Fish	100 m	Length	Range	Species
		Captured	(CPUE)	(mm)	(mm)	Composition
		-				(%)
Below	WCT	2	1.1	287	210-363	4
Crash	EB	55	30.6	265	161-429	96
Site	LNSU	40	22.2	171	93-233	-
	RMCOT	12	6.7	89	61-142	-
RM 11.1	WCT	39	39	127	70-247	41
	EB	56	56	115	42-209	59
RM 11.8	WCT	24	24	116	55-254	60
	EB	16	16	114	33-195	40
RM 12.5	WCT	29	29	95	54-196	50
_	EB	29	29	101	73-240	50

Table 28. Electrofishing data collected at four sites on Blacktail Creek in 2016. Data presented is from the first electrofishing pass where multiple passes were made.

Jon Gulch

Jon Gulch is a small tributary that enters Blacktail Creek at approximately RM 6.4. Connection of the two streams is seasonal and often only occurs during spring runoff. A basic electrofishing survey was completed in late May of 2016 to determine the presence or absence of fish in this small stream. A single upstream electrofishing pass that focused on the best available habitat was completed between RM 0.1 and RM 0.7. No fish were captured or observed during this survey.

Tributary to Blacktail Creek near RM 9.3

A basic electrofishing survey was completed in late June of 2016 to determine the presence or absence of fish in a small tributary that entered Blacktail Creek near RM 9.3 (right bank). Spot electrofishing that focused on the best available habitat was completed between the Highway 2 crossing and the headwaters of the stream. Immediately below the highway crossing one westslope cutthroat trout (147 mm in length) and two brook trout (47 and 135 mm in length) were observed. Upstream of the crossing, a single westslope cutthroat trout (122 mm in length) was captured in a small segment of stream that was able to be electrofished. Fish could also be seen rising in a small beaver pond about 200 meters upstream of the Highway 2 crossing. This appeared to be the upper extent of fish distribution based on further survey of the channel upstream of this location. No sampling was conducted in the lower part of the stream closer to the confluence with Blacktail Creek.

Tributary to Blacktail Creek near RM 9.5

A basic electrofishing survey was completed in late June of 2016 to determine the presence or absence of fish in a small tributary that entered Blacktail Creek near RM 9.5 (right bank). Spot electrofishing that focused on the best available habitat was completed upstream of the Roosevelt Drive crossing near the mouth of the stream. This crossing appeared to be passable to fish moving upstream at the time of the survey. The stream proved difficult to sample due to its small size and shallow habitat. The survey only consisted of sampling about four pools that were deep enough to electrofish. A total of 11 westslope cutthroat trout (mean length: 78 mm, length range: 71-90 mm) were captured with this effort.

We proceeded upstream to the Highway 2 crossing of the drainage and sampled two pools below the concrete box culvert that was present. Several westslope cutthroat trout were found in the sampled pools. Upstream of the highway crossing no fish were captured or observed. The channel got very steep with a number of drops and cascades present. It appears that the Highway 2 crossing is about the upper extent of fish distribution in this drainage.

Tributary to Blacktail Creek near RM 9.6

A basic electrofishing survey was completed in late June of 2016 to determine the presence or absence of fish in a small tributary that entered Blacktail Creek near RM 9.6 (right bank). Spot electrofishing that focused on the best available habitat was completed upstream of the Roosevelt Drive crossing near the mouth of the stream. No fish were captured or observed with this effort. There were virtually no pools present in this extremely small and shallow stream.

Tributary to Blacktail Creek near RM 9.9

A visual survey was completed in late June of 2016 to determine the presence or absence of fish in a small tributary that entered Blacktail Creek near RM 9.9 (left bank). The best available habitat was inspected upstream of the mouth and it was determined that the stream was likely too small to support fish. No fish were captured or observed with this effort.

Tributary to Blacktail Creek near RM 10.1

A basic electrofishing survey was completed in late June of 2016 to determine the presence or absence of fish in a small tributary that entered Blacktail Creek near RM 10.1 (right bank). Spot electrofishing that focused on the best available habitat was completed

from the stream mouth to the headwaters (a spring). No fish were captured or observed with this effort. While there was a good amount of flow in the channel at the time of the survey, the stream had a relatively steep gradient.

Unnamed Fork of Blacktail Creek near RM 11.3

A one-pass electrofishing survey was completed in late May of 2016 to determine the presence or absence of fish in an unnamed fork of Blacktail Creek that joins the stream near RM 11.3 (left bank). The sample reach was located about 1.3 km upstream of the stream mouth, and was on private land where the construction of several beaver dam mimics was proposed during the summer of 2016. The sample section was approximately 190 m in length and had good flow at the time of the survey. However, this segment of the stream had been observed to dry up during low flow periods. Westslope cutthroat trout were the only fish collected in the sample reach, although densities appeared very low. Table 29 contains a summary of data collected at the site.

Table 29. Electrofishing data collected at one sections of	f an unnamed fork of Blacktail
Creek near RM 11.3 in 2016.	

Section	Species	Number	Fish per	Mean	Length	Species
Name		of Fish	100 m	Length	Range	Composition
		Captured	(CPUE)	(mm)	(mm)	(%)
Brewer	WCT	6	3.2	128	114-157	100
Property						

Additional electrofishing was completed on a small tributary to the unnamed fork of Blacktail Creek that entered the stream at the top of the main survey reach (right bank). The sample consisted of a single electrofishing pass through an approximately 230 m section (starting at the mouth of the stream). Similar to the main-channel survey reach, fish density was relatively low, with westslope cutthroat trout dominating the catch. However, during this survey a single brook trout was also captured in the reach. Table 30 contains a summary of data collected at the site.

Creek near RM 11.3 in 2016.								
Section	Species	Number	Fish per	Mean	Length	Species		
Name		of Fish	100 m	Length	Range	Composition		
		Captured	(CPUE)	(mm)	(mm)	(%)		
Brewer	WCT	11	4.8	118	95-156	92		
Property	EB	1	0.4	114	-	8		
& Lower								
USFS								

Table 30. Electrofishing data collected at one sections of an unnamed fork of Blacktail Creek near RM 11.3 in 2016.

Tributary to Blacktail Creek near RM 11.8

A basic electrofishing survey was completed in late June of 2016 to determine if fish were present in a small tributary that entered Blacktail Creek near RM 11.8 (right bank) in an area where simulated beaver dams were to be constructed in the summer of 2016. Spot electrofishing that focused on the best available habitat was completed from the stream mouth to the U.S. Forest Service boundary approximately 300 m upstream. One westslope cutthroat trout (length: 132 mm), two brook trout (lengths: 104 & 115 mm), and six other unidentified trout that were not netted were the only fish observed. The stream was very small and habitat was rather limited. Numerous old beaver dams were noted throughout the upper portion of the reach.

LAKES and PONDS

Gold Creek Drainage

Goldberg Reservoir

In the spring of 2016, several calls were fielded from anglers that informed of poor fishing at Goldberg Reservoir. Goldberg Reservoir is a small mountain reservoir (approximately 8 acres) that supports a stocked westslope cutthroat trout fishery. The reservoir was last stocked in 2015 and is on an every other year stocking schedule. With the reservoir having had issues with winter kill in the past, we conducted a fish survey in May of 2016. The survey consisted of setting one gill net (125' x 4' mountain lake experimental) off the west shore of the reservoir. The net captured five westslope cutthroat trout during the overnight set. Table 31 contains a summary of the fish captured. Although the reservoir did not appear to have winter killed, it did seem that fish density was rather low. The reservoir gets a lot of recreational fishing pressure and it is possible that the harvest of fish by anglers is a likely cause for the low fish densities in the reservoir.

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Table 31. Gillnet data collected on Goldberg Reservoir in 2016.

German Gulch Drainage

McGuiness Pond

McGuiness Pond is a small manmade pond (approximately 2 acres) situated on a tributary to Norton Creek, which joins the stream near RM 1.9. The pond is located within the boundaries of the Mount Haggin Wildlife Management Area managed by FWP. Having never sampled the pond, a single gillnet (125' x 4' mountain lake experimental) was placed off the partially breached dam face in June of 2015 to determine if fish were present. The net captured six westslope cutthroat trout and one brook trout during the overnight set. Several of the fish were quite large given the small size of the stream and pond. Table 32 contains a summary of the fish that were collected.

Table 52. Offinet data confected on Webdiness Fond in 2015.							
# of	Species	Number	Mean Fish	Mean	Length	Species	
Nets Set	Captured	of Fish	per Net	Length	Range	Composition	
		Captured		(mm)	(mm)	(%)	
1	WCT	6	6	287	213-395	86	
	EB	1	1	450	-	14	

Table 32. Gillnet data collected on McGuiness Pond in 2015.

Basin Creek Drainage

Basin Creek Reservoir

Basin Creek Reservoir is a moderate sized (approximately 45 acre), municipal water supply reservoir located near the headwaters of Basin Creek. The reservoir is located within a watershed closed to public access because it is a drinking water source for the community of Butte. Recently, the Butte-Silver Bow (BSB) public works department began construction on a state-of-the-art water treatment plant that will be used to treat Basin Creek Reservoir water (which previously had been used with minimal treatment). Following completion of the new plant (likely in 2017), the historic closure of the watershed will no longer be necessary. There have been talks between BSB, FWP, the Natural Resource Damage Program and others regarding opening the reservoir for public access including fishing. In an effort to better understand the fishery in the reservoir, three gillnets (125' x 6' experimental; 2 floating and 1 sinking) were used to survey the lake in late September of 2015. Nets were set in the inlet bay (floating net), in the middle of the lake (sinking net), and in the west arm of the reservoir near the dam (floating net). Westslope cutthroat trout were the only species captured in all of the nets. Fish density appeared to be rather high based on the total catch. The mid-lake gillnet set captured 111 fish alone, while the inlet set and the west arm set captured 43 and 26, respectively. Table 33 contains a summary of fish collected in Basin Creek Reservoir in 2015.

Tuble 55. Officer duti concered on Bushi creek Reservon in 2015.						
# of	Species	Number	Mean Fish	Mean	Length	Species
Nets Set	Captured	of Fish	per Net	Length	Range	Composition
		Captured		(mm)	(mm)	(%)
3	WCT	180	60	290	162-412	100

Table 33. Gillnet data collected on B	Basin Creek Reservoir in 2015.
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