Tom Miner Basin Sampling 2010

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Introduction

Tom Miner basin is located approximately 30 miles south of Livingston, Montana on Montana Highway 89 South and lies in both Gallatin and Park Counties. The basin has a drainage area of 41,821 acres. Tom Miner Creek is the primary stream in the basin and is a tributary to the Yellowstone River. Tom Miner Creek is 13.9-miles long and has a number of tributaries within the basin.

The presence of Yellowstone cutthroat trout has been documented historically in the basin. In August of 2010 a cooperative sampling effort between Montana Fish, Wildlife & Parks (FWP) and the Gallatin National Forest was started in the basin. The project goal was to compete an intensive longitudinally-stratified sampling of streams in the basin in order to determine the distribution of all fish species with specific focus on Yellowstone cutthroat trout.

Methods

Electrofishing crews consisted of 2 to 3 people equipped with a Smith-Root LR-24™ backpack electrofisher. Maps of the basin were created through the use of Geographic Information System (GIS) and sampling points were plotted every 0.5 miles (beginning at the stream mouth and proceeding upstream) on all waters in the basin. Sampling of a specific water began at the mouth or the lowest accessible point and proceeded upstream. Once crews reached a 0.5-mile sampling point, a sampling section was measured 100 meters upstream from that point with the use of a hip chain. At a minimum a one pass electrofishing sample was completed beginning at each 0.5-mile sampling point. In an alternating pattern, every other 0.5-mile sampling point was designated for a multiple pass depletion estimate in order to obtain fish density information. If less than ten fish of a given species were captured, in one of the sections designated for a multiple pass depletion estimate, no further passes were conducted. Tom Miner Creek was the only exception to the 100 meter sampling section length. Because of the size of this stream a 1,881 meter sampling section was completed in order to cover enough habitat to get an adequate sample.

All fish that were collected were anesthetized, identified to species, measured to the nearest mm and weighed to the nearest .01 gram. Fin clips were taken from Yellowstone cutthroat trout and stored in ethanol for later genetic analysis.

Results

Horse Creek

Horse Creek was sampled on August 9 and 10, 2010. A total of eight sections were sampled. Four of the sections were on private land and four were on U.S. Forest Service land (Figure 1). Yellowstone cutthroat trout were found in four of the eight sections. A depletion estimate was conducted in section number 11862 of 9 fish per 100m. No other species were captured or observed in any of the sections.

Genetics were collected from Yellowstone cutthroat for later evaluation. No sections were sampled above section 11867 because of lack of fish and steep gradient of the stream.

Table 1: Horse Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
11860	100	2.7	-	0
11861	100	-	-	3
11862	100	3	50.9	8
11863	100	4.6	52	4
11864	100	4.5	-	0
11865	100	3.5	-	2
11866	100	3	-	0
11867	100	-	-	0

Unnamed Tributary to Horse Creek

This is the tributary farthest to the east of Horse Creek. Three sections in this tributary were sampled on August 9, 2010 (Figure 1 and Table 2). Yellowstone cutthroat were captured in the lower two sections (Table 3).

Table 2: Unnamed Tributary to Horse Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
11870	100	.5	57	2
11872	100	.5	57	3
11873	100	-	-	0

Table 3: Yellowstone Cutthroat Trout Lengths and Weights from Section 11870 and Section 11872

Section 11870			Section 11872	
Length (mm)	Weight (g)		Length (mm)	Weight (g)
141	26		122	16
156	43		162	44
			171	53

Unnamed Tributary to Horse Creek

This is the first tributary to the east of Horse Creek. Two sections on private land were sampled on August 10, 2010 (Figure 1 and

Table 4). Yellowstone cutthroat were only captured in the lowest section (Table 5). The section on U.S. Forest Service land was not sampled.

Table 4: Unnamed Tributary of Horse Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
16804	100	0.6	49	1
16805	100	1.4	49	0

Table 5: Yellowstone Cutthroat Trout Lengths and Weights for Section 16804

Section 16804	
Length (mm)	**Weight (g)**
39	34

Grizzly Creek

Three sections were sampled in Grizzly Creek on August 10, 2010 (Figure 1 and Table 6). Grizzly Creek is a tributary to Horse Creek. No fish were captured or observed in any of the sections.

Table 6: Grizzly Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
17922	100	1.2	49	0
17923	100	1.3	45	0
17924	60	0.8	43	0

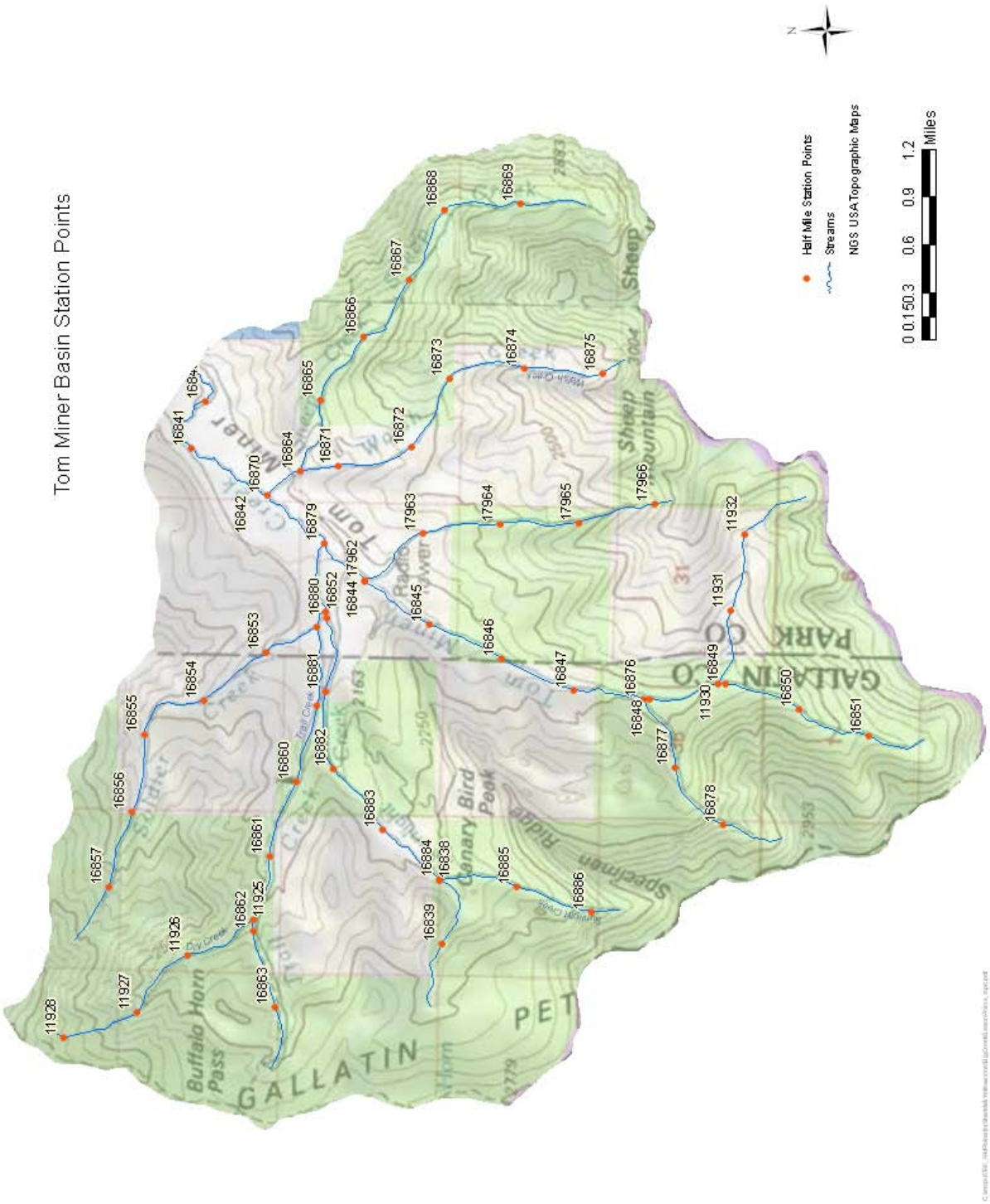

Figure 1: Map of Tom Miner Basin Station Points

Sheep Creek

No fish were found in the two sections of Sheep Creek that were sampled. These sections were sampled on August 12, 2010 and both sections were located on U.S. Forest Service land (Figure 2 and

Table 7). No further sections were sampled due to lack of fish and an approximate 15% stream gradient.

Table 7: Sheep Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
16865	100	-	-	0
16866	100	1.5	40.8	0

Sunlight Creek

On August 11 and 12, 2010, five sections were sampled on Sunlight Creek. Two of the sections were on U.S. Forest Service land and the rest were on private land (Figure 2 and Table 8). Yellowstone cutthroat were only captured in the lower two sections (Table 9). No other fish were observed or captured in any of the other sections. Sections 16885 and 16886 were not sampled due lack of fish in lower sections.

Table 8: Sunlight Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
16879	100	3	46	6
16880	100	-	43	2
16882	100	-	-	0
16883	100	-	44.5	0
16884	100	-	44.5	0

Table 9: Yellowstone Cutthroat Trout Lengths and Weights for Section 16879 and 16880

Section 16879			Section 16880	
Length (mm)	Weight (g)		Length (mm)	Weight (g)
105	10		91	15
128	26		187	79
155	46			
185	65			
186	80			
201	102			

Trail Creek

The Trail Creek sections were sampled on August 11, 2010 and all of the sampled sections with the exception of section A were on U.S. Forest Service land (Figure 2 and Table 10). Yellowstone cutthroat trout were captured in four of the five sections (Table 11 and Table 12). No other fish were captured or observed. A depletion estimate was made in section 16861 of 5 fish per 100m. Genetics were collected for later analysis. Section 16863 was not sampled.

Table 10: Trail Creek Sampling Sections

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (^{o}F)	Yellowstone cutthroat captured
A	100	1.5	47.3	3
16859	100	3	52.5	3
16860	100	3	50.1	2
16861	100	3	48.6	5
16862	100	-	45	0

Table 11: Yellowstone Cutthroat Trout Lengths and Weights for Section A and 16859

Section A			Section 16859	
Length (mm)	Weight (g)		Length (mm)	Weight (g)
153	49		132	25
190	90		158	41
218	148		209	120

Table 12: Yellowstone Cutthroat Trout Lengths and Weights for Section 16860 and 16861

Section 16860			Section 16861	
Length (mm)	Weight (g)		Length (mm)	Weight (g)
125	20		124	26
169	70		136	29
			142	38
			180	56
			183	70

Dry Creek

One section was sampled on Dry Creek on August 11, 2010 (Figure 2 and

Table 13). No fish were captured or observed in the section. No other sections were sample in this stream.

Table 13: Dry Creek Sampling Section

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
11925	100	-	50.5	0

Tom Miner Creek

On August 9 and 11, 2010, six sections were sampled on Tom Miner Creek. Five of the sections were on private land and one was on U.S. Forest Service land (Figure 2 and Table 14). Yellowstone cutthroat trout were captured in three of the five sections samples. Other species sampled included: brown trout and a hybrid Yellowstone X Rainbow cross in section 16842 and a rainbow in section 16783 (Table 15,

Table 16, and Table 17). A barrier waterfall was found upstream from section 16847, located at N 45.09826, W 111.05038 (NAD 83).

Table 14: Tom Miner Creek sampling sections.

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (^{o}F)	Yellowstone cutthroat captured
16783	100	7	-	0
16842	1881	5.2	46	24
16844	100	3.9	48	2
16845	100	-	48	Missed 2 fish
16846	100	2.9	48	2
16847	100	3.9	46	0

Table 15: Rainbow trout length and weight data for section 16783.

Section16783	
Rainbow Length (mm)	Weight (g)
360	-

Table 16: Yellowstone cutthroat, brown, and Yellowstone x rainbow hybrid trout length and weight data for section 16842.

Section 16842					
Yellowstone			**Brown**		
Length (mm)	**Weight (g)**		**Length (mm)**	**Weight (g)**	
115	16		120	19	
120	19		184	73	
124	103		234	141	
131	22		270	245	
132	21				
137	30				
146	34		**Hybrid**		
146	30		**Length (mm)**	**Weight (g)**	
156	45		310	354	
157	46				
170	52				
173	54				
173	61				
173	62				
175	57				
178	70				
183	75				
190	79				
192	93				
193	76				
244	168				
251	183				
260	165				
280	268				

Table 17: Yellowstone cutthroat trout length and weight data for section 16844 and 16846.

Section 16844			**Section 16846**	
Length (mm)	**Weight (g)**		**Length (mm)**	**Weight (g)**
162	47		137	30
197	89		183	74

Unnamed Tributary to Tom Miner

This tributary is located in a State Lands Section, and was sampled on August 9, 2010. Two sections were sampled; however, crews determined that flow was insufficient to support fish. This tributary had approximately 0.25 cfs of discharge.

Skully Creek

Skully Creek was sampled on August 12, 2010. Four sections of the creek were sampled and all were on private land (Figure 2 and Table 18). Yellowstone cutthroat were captured in the two lowest sections (Table 19). Netters missed one fish in each of the first two sections. No fish were captured or observed

in the upper two sections that were sampled. No sampling occurred on U.S. Forest Service land due to lack of fish in the two reaches immediately downstream. Genetic tests on sampled fish are pending.

Table 18: Skully Creek sampling sections.

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
11844	100	2.7	45	3
11845	100	2.4	45	4
11846	100	1.9	48	0
11847	100	2.4	45	0

Table 19: Yellowstone cutthroat trout length and weight data for section 11844 and 11845.

Section 11844		Section 11845	
Length (mm)	Weight (g)	Length (mm)	Weight (g)
176	69	206	106
199	88	176	57
129	24	177	65
		205	104

Twin Peaks

Only one section was sampled on Twin Peaks Creek on August 12, 2010. The section was located on private land and a total of 4 Yellowstone cutthroat trout were captured. No other fish species were captured or observed. A barrier waterfall was located upstream of this section; therefore, no further sampling was conducted upstream of the waterfall. The barrier was located at N 45.15147, W 110.04044 (NAD 83).

Table 20: Twin Peaks sampling section.

Section #	Section Length (m)	Average Stream Width (m)	Water Temperature (°F)	Yellowstone cutthroat captured
16793	100	2.5	45	4

Table 21: Yellowstone cutthroat trout length and weight data for section 16793.

Section 16793	
Length (mm)	Weight (g)
136	28
162	43
173	57
207	82

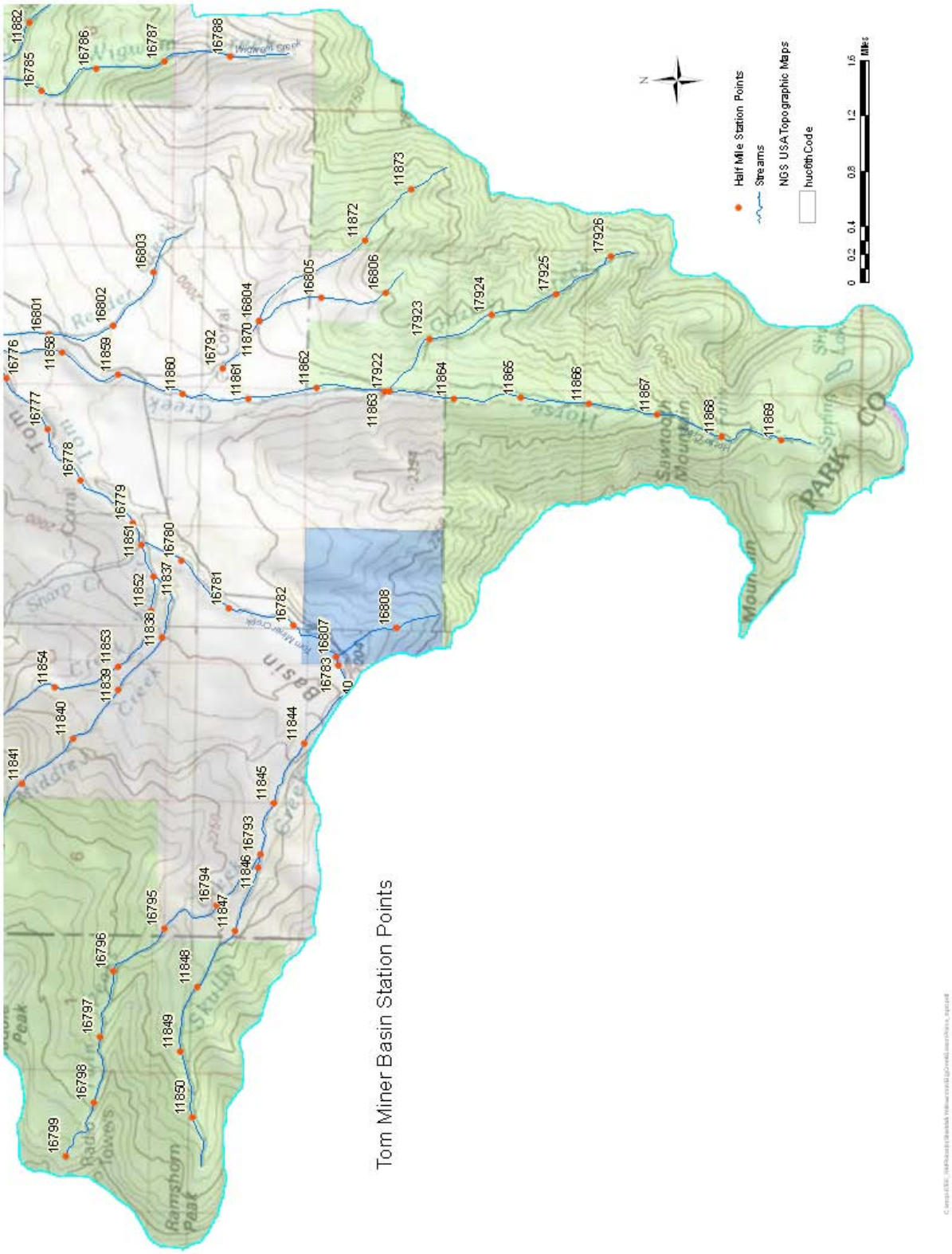

Figure 2: Map of Tom Miner Basin Sampling Points

Summary

Initial results of the survey effort are encouraging. Even though rainbow trout are present in the lower reaches of Tom Miner Creek none were captured in any of the sampled tributaries and no morphological indications of hybridization were noted in any of the captured fish. Eastern brook trout were not captured in any of the sampled waters. Brown trout were the only other species captured and they were only found in Tom Miner Creek. No barriers were identified that would protect existing populations of Yellowstone cutthroat trout. There may be some potential to create barriers on tributaries that are crossed by county and U.S. Forest Service roads. Further research will be needed to determine the degree of migration from Tom Miner Creek into other tributaries, especially for spawning. Further sampling of the remaining tributaries to Tom Miner Creek will be conducted in future years.

Although no morphological indications of hybridization were noted in any of the captured fish (with the exception of the one hybrid cutthroat trout in Tom Miner Creek) results from genetic analyses are required to further assess the genetic purity of sampled fish. Genetic analyses are being conducted by FWP and the University of Montana. Results of the genetic analyses are anticipated by the summer of 2011.