PACIFIC RIVERS

Annual Report
Fiscal Year 2022
And Summary of Surveys 2011 - 2022

Canton Creek Snorkel Surveys

Prepared by Pacific Rivers

January 13, 2022

EXECUTIVE SUMMARY

During eleven of the last twelve summers, a snorkel survey of Canton Creek (North Umpqua basin) has been completed. During 2022, the survey was completed by Andrew Dewberry, Emma Latendresse, Isaiah Hall, and Charley Dewberry. The Phoenix School participated in the survey and two teams completed the survey of Pass Creek and Upper Canton Creek. The survey included all of the mainstem of Canton Creek, Pass Creek, East and West Pass Creek, and Mellow Moon Creek. This comprises the total area snorkeled during most of the previous surveys.

The water year (October 1, 2021 to September 30, 2022) started out normal. There were five storm events over 1,000 cfs from November to January. Each storm was larger than the previous one. The January storm, the largest of the year, was just under 8,000 cfs, which is below normal. To this point, the water year would be favorable to successful spawning during the water year. The high flow event was only about 8,000 cfs. This is enough flow to get the steelhead into the tributaries, but it is not enough to make it easy for the fish to make it far into the headwaters of the tributary streams. The fish were able to make it into the tributary streams in January and successfully spawn. However, after that it was an unusual year. Although there were no flows greater than 8,000 cfs after the January storm, which should provide a good year for survival of the eggs and juveniles, between March 1 and June 15th there were 9 peak flows greater than 1,000 cfs. Most were between 1,100 and 4,000 cfs. It would be expected that each of these 9 storms would be highly detrimental to the juvenile steelhead that had just emerged from the gravel. So, the expectation would be that age-0 steelhead found in the basin during the summer months would be lower than average. As far as age-1 and age-2 steelhead are concerned, the water year should be advantageous to good rearing. First, the peak flow observed during the water year occurred in January which is typical, and it was below average. Second, the higher-than-average stream flows during the summer provided plenty of habitat and the high stream flows help keep summer temperatures lower.

The snorkel surveys enable us to construct a snapshot of summer rearing of salmonids in Canton Creek. This snapshot of the abundance and distribution of steelhead (the dominant salmonid) in the basin and the evaluation of the stream habitat and landscape processes provide basic information to identify restoration opportunities within the basin. With each additional year of survey, the trends in the population of each salmonid and age class of steelhead become clearer. It also allows us to greater understand the factors affecting the abundance and distribution of the salmonids in the basin.

During this sample season we were able to complete all our survey of Canton Creek. We analyzed the total estimated number of salmonids of each age within the basin and then examined the trends within each reach. During 2022, the number of age-0 steelhead in the mainstem of Canton Creek was the second lowest recorded in our 11 years of sampling. A total of 9,986 age-0 steelhead were estimated to be in the basin. Also, all tributaries had lower than average number of age-0 steelhead.

During 2022, the number of age-1 steelhead in the Canton Creek was 4,239. This was the second highest population estimate in the 11 years of sampling. The mainstem of Canton Creek and all major tributaries had a higher-than-average number of age-1 steelhead.

During 2022, the number of age-2 steelhead was twice as high as the previous high estimate for the Canton creek basin for the entire 11 years of sampling.

During 2022, the cutthroat trout population was higher than average; however, two sample year estimates were higher. Most curiously, the population estimate of cutthroat trout was very much higher than anticipated in Upper Canton Creek. The previous high estimate for Cutthroat Trout in Upper Canton Creek was 64 fish. The estimate for 2022 was 223 fish.

INTRODUCTION

In 2011, a partnership was formed among the Pacific Rivers Council, Phoenix School in Roseburg, Oregon, the Cow Creek Tribe, and the BLM to begin collecting baseline information prior to designing a restoration project within the Canton Creek Drainage basin. The Canton Creek Drainage was of interest because it is partially within the Oregon and California Railroad Lands (O&C) as well as being strategically located within the North Umpqua basin. This project provides an opportunity to collect background information for designing an effective restoration project within the context of the North Umpqua drainage.

During eleven summers (2011-2022 minus 2012): a snorkel survey for juvenile salmonids in Canton Creek (North Umpqua basin) was completed by Phoenix School students and Pacific Rivers. Thomas McGregor, Director of work experience at the Phoenix School, coordinated the student participation. During the current year, the Phoenix School and Pacific Rivers completed the survey. The divers from Pacific Rivers were Andrew Dewberry, Emma Latendresse, Isaiah Hall, and Charley Dewberry. The survey included all of the mainstem Canton Creek, Upper Canton Creek, Pass Creek, East and West Pass Creek, and Mellow Moon Creek (Figure 1).

STUDY AREA

Canton Creek is a major tributary of Steamboat Creek in the North Umpqua River basin. The drainage area is approximately 60 square miles. Canton Creek is a strategically important producer of steelhead trout, coho salmon, chinook salmon and cutthroat trout within the North Umpqua drainage. Most of the western two-thirds of the basin are BLM-private land checkerboard (O&C lands). The remaining one-third of the basin is managed by the USFS.

The basin is entirely within the western Cascades. The geology is dominated by weathered Tertiary volcanic rocks. The dominant forest community is western Hemlock- Douglas fir.

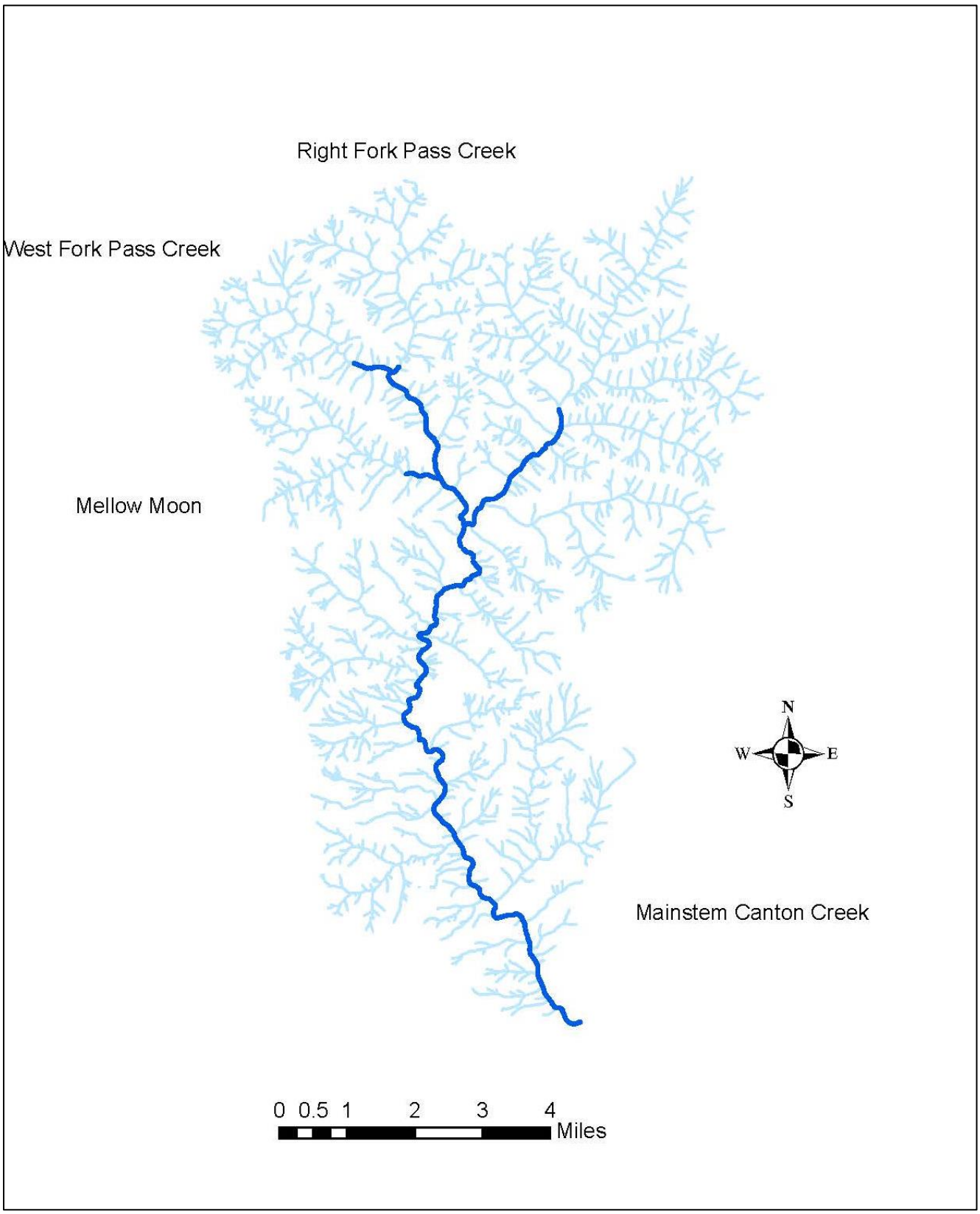

Figure 1: Canton Creek Waterways with the Steamboat Basin of the North Umpqua.

METHODS

The snorkel surveys were conducted during August and September each year using the Hankin-Reeves method (Hankin and Reeves 1990). A dive crew consisting of two or more people work their way upstream through their designated stream reach. The stream channel was divided into three habitat types: riffles, pools, and glides. For each habitat unit, the length and width were estimated. The frequency of the surveyed units was: 1:10 riffles; 1:8 glides; and 1:5 pools. All salmonids were counted in each surveyed stream habitat. In the habitat units that were snorkeled, the length and width were measured.

For these surveys, age-0 and 1 trout include both steelhead and cutthroat trout. While some individuals are easy to identify into their respective species, others are difficult. As a result, we elected to combine both species into these age categories. Age-2 steelhead were differentiated from age-2 cutthroat trout. While a few adult salmonids were observed in the surveys, they are not included in this discussion.

RESULTS AND DISCUSSION

The Water Year

The water year (October 1, 2021 to September 30, 2022) was an unusual water year. From October 1, 2021, through January 2022, the water year was typical. There were five storms, each larger than the previous one, culminating in the highest flow in January. This is the primary storm that the steelhead used to migrate into tributary streams to spawn. However, the high flow event was only about 8,000 cfs, which is below average. This is enough flow to get the steelhead into the tributaries, but it is not enough to make it easy for the fish to make it far into the headwaters of the tributary streams; however, from March 1 through the end of the water year on September 30, 2022, it was a highly unusual year. From March 1 through mid-June, there were a series of nine storms between 1,000 cfs and 4,000 cfs. As a result of these storms the summer base-flows were higher than average through the summer period.

Surveyed Reaches

During the eleven years, the following reaches of Canton Creek were snorkeled each year: the mainstem up to the confluence with Pass Creek, Pass Creek (including both forks), Upper Canton Creek, and Mellow Moon Creek.

In previous years, the mainstem of Canton Creek was primarily snorkeled by Charley and Andrew Dewberry. During this year, the mainstem of Canton Creek was snorkeled by Andrew Dewberry and Emma Latendresse. The Phoenix school students surveyed Pass Creek and upper Canton Creek. The student counts were verified by Charley Dewberry

Salmonid Population Estimates

The results of the eleven years of snorkel surveys are summarized in Tables 1-4. Steelhead trout, and cutthroat trout were observed, and their populations estimated in the basin. In addition, a few adult steelhead and Chinook salmon were observed in the mainstem of Canton Creek, but their numbers were low and were not estimated. In previous years, population estimates were made of coho salmon. During the current year about 1,218 coho salmon were estimated to be in the lower mile of the mainstem Canton Creek. This is three times the highest previous estimate of coho in the lower mile of Canton Creek.

Age-0 Steelhead

Steelhead trout were the most abundant salmonid within the basin. As expected, age-0 fish dominated the survey. During the eleven years of survey, between 7,000 - 40,000 age-0 steelhead were usually observed in the major surveyed reaches. During the current year, just under 10,000 age-0 fish were estimated to be in the basin. This is the second lowest estimates of age-0 steelhead observed in the basin during the eleven years of sampling.

Both the mainstem of Canton Creek and all the tributaries had lower than average counts. These results are not surprising. It is likely that the series of high-flow events from March 1 to mid-June decimated the age-0 steelhead as they emerged from the gravel during the spring. The age-0 steelhead that survived the March to June period, likely had higher than average survival as summer stream-flows were higher than average and this provided an abundance of summer habitat and buffered stream temperatures.

To summarize, the total number of age-0 steelhead observed in 2022 was below average in all reaches of Canton Creek and tributaries. It is highly likely the spring high-flow events were responsible for the low survival of the age-0 steelhead.

Age-1 Steelhead

The population estimates of age-1 steelhead were between 1,460 and 5,000 fish for the previous eleven years of sampling (Table 2). During the current year, 4,239 age-1 steelhead were estimated to be in the Canton Creek basin. This is the second highest estimate of age-1 steelhead in the basin during the entire eleven years of survey. The mainstem of Canton creek and all the tributary reaches of stream had higher than average estimates.

This is not surprising given the water year. The peak flow for the water year was only about 8,000 cfs. This is below average. So, there were no large storms that led to high mortality for this age-class of steelhead. In addition, the series of spring storms were not so large as to lead to high mortality of these fish. Lastly, the summer low-flows were higher than normal which creates an abundance of summer habitat and buffers stream temperature. It is also possible that the high summer flows kept more age-1

steelhead in Canton Creek rather than they migrated downstream into the North Umpqua during the summer months.

Age-2 Steelhead

The population estimates for age-2 steelhead in previous years were between 268 and 950 fish (Table 3) for the eleven years of survey. During the current year, the estimated number of age-2 steelhead in the basins was over 2,425 fish. This is twice as high as the previous high count. All stream reaches, mainstem and tributaries, had higher than average counts. Again, this is not surprising given the water year. It is possible that due to the high summer flows more age-2 steelhead remained in Canton Creek than usual.

Data Table Providing Population Estimates of various Species by Age Class in Canton Creek, Years 2011, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, and 2022

Table 1. Population estimates of Steelhead Age 0 in Canton Creek (2011 - 2022).

Reach	2011	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
Mainstem	32,968	15,430	7,433	23,180	11,537	20,768	13,780	3,902	29,755	12,001	6,928	16,153
Upper Canton	3,888	5,948	3,247	4,901	1,372	4,929	6,274	822	3,431		1,236	3,605
Pass Creek	3,138	9,523	5,089	5,491	4,784	6,279	6,652	1,911	4,689	3,175	1,461	4,745
RF Pass Creek		200	131	462	572	386	12	245	373	114	75	257
LF Pass Creek		165	216	716	498	410	458	116	291	377	228	348
Mellow Moon	135	233	165	529	207	582	165	306	346	548	58	298
Total	*40,129*	*31,499*	*16,281*	*35,279*	*18,970*	*33,354*	*27,341*	*7,302*	*38,885*		*9,986*	*25,903*

Table 2. Population estimates of Steelhead Age 1 in Canton Creek (2011 - 2022).

Reach	2011	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
Mainstem	3,615	892	1,512	1,585	796	745	1,385	1,232	1,549	1,064	2,705	1,553
Upper Canton	1,059	644	444	685	134	357	945	194	53		516	503
Pass Creek	211	937	518	287	264	278	284	425	148	638	718	428
RF Pass Creek		6	0	4	118	0	0	186	81	92	101	59
LF Pass Creek		35	37	31	48	58	13	34	86	138	65	55
Mellow Moon	197	53	12	228	154	22	16	142	17	61	134	94
Total	*5,082*	*2,567*	*2,523*	*2,820*	*1,514*	*1,460*	*2,643*	*2,213*	*1,934*	*1,993*	*4,239*	*2,635*

Table 3. Population estimates of Steelhead Age 2 in Canton Creek (2011 - 2022).

Reach	2011	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
Mainstem	673	113	432	301	96	188	728	546	844	336	1,750	546
Upper Canton	173	36	102	146	28	80	116	23	9		320	103
Pass Creek	29	124	84	25	26	8	13	148	0	122	249	75
RF Pass Creek		0	0	4	50	0	0	11	38	24	44	17
LF Pass Creek		0	0	0	5	5	4	0	11	35	13	7
Mellow Moon	69	58	6	10	63	0	0	5	0	17	49	25
Totals	*944*	*331*	*624*	*486*	*268*	*281*	*861*	*733*	*902*		*2,425*	*786*

Table 4. Population estimates of Cutthroat in Canton Creek (2011 - 2022).

Reach	**2011**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Avg**
Mainstem	167	42	165	154	32	36	328	246	563	110	142	180
Upper Canton	31	35	6	0	0	11	14	48	62		221	43
Pass Creek	107	13	15	0	0	16	0	29	102	77	10	34
RF Pass Creek		0	0	0	20	0	0	28	8	28	0	8
LF Pass Creek		0	0	0	0	0	0	6	0	0	10	2
Mellow Moon		0	6	0	0	0	0	64	0	6	0	8
Total	*305*	*90*	*192*	*154*	*52*	*63*	*342*	*421*	*735*		*383*	*274*

Cutthroat Trout

During the eleven years of survey, the estimated number of Cutthroat trout in the Canton Creek basin has ranged from 52 - 735 fish. During the current year, the estimated number of Cutthroat in the basin was 383, which is higher than average. Ironically, the estimated number of Cutthroat Trout in the mainstem was below average. Usually, the highest number of Cutthroat Trout is observed in the mainstem. During the current year Upper Canton Creek had more Cutthroat Trout than the mainstem did. The estimated number of Cutthroat Trout in Upper Canton Creek was almost four times the previous high population estimated in this reach. Curiously, in Pass Creek, the estimated number of Cutthroat Trout was 10 fish, which is significantly below the average estimate of fish observed in the reach during the eleven years of survey. We have no explanation for the unusual abundance and distribution of fish in Pass and Upper Canton Creeks.

Coho and Chinook Salmon

In each survey year, some coho salmon juveniles were observed in the lower reaches of Canton Creek. During 2022, we observed an estimate of 1,218 coho juveniles in the lower mainstem of Canton Creek. This estimate is three times higher than the previous high observed in the eleven years of sampling. All coho were observed below the falls, just below the first bridge crossing over Canton Creek (about the 1-mile marker). Coho juveniles were obviously not negatively affected by the series of spring storms, and they survived well during the summer with the higher-than-average flows.

Chinook salmon juveniles were observed in very low numbers in lower Canton Creek in each of the surveys. Their numbers were so low that reliable population estimates could not be made. No more than 10 juveniles were observed in any one year. All observed Chinook were below the first series of falls.

Overview of the Salmonids in the Basin

The lower ten miles of the mainstem of Canton Creek are the most important reaches for adult cutthroat trout and juvenile coho and chinook salmon. No juvenile coho or chinook salmon juveniles were observed above the third falls, just below the first bridge. Steelhead trout of all ages are distributed throughout the Canton Creek basin.

CONCLUSION

The 2021-2022 water year was a typical year timing-wise of major winter storms, with the peak flow during the year occurring in late January. The peak flow was under 8,000 cfs. These conditions are conducive for successful spawning; however, the unusual series of nine spring storms led to higher-than-average flows during the summer months. The estimated population of age-0 steelhead in the basin was well below average probably due to the series of spring storms. All the rest of the salmonids appeared to benefit from the spring storms and high summer flows.