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2019 Steamboat Creek Snorkel Survey

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Prepared by Pacific Rivers, a 501(c)(3) organization

Executive Summary

The Frank and Jeanne Moore Steelhead Sanctuary, which was established in March 2019, created a 100,000 acres sanctuary and temperature refuge for steelhead trout (O. mykiss) and other native anadromous salmonids within the North Umpqua basin. This sanctuary also acts as key source of cold water for both Steamboat Creek and the North Umpqua River.

During the summer of 2019 a snorkel survey of Steamboat Creek and its tributaries was completed by Charley and Andrew Dewberry, Alex Brereton, and Alan Bunce (Pacific Rivers). The survey included the majority of the mainstem of Steamboat Creek and the tributaries large enough and with open access for steelhead trout to reach. This survey enabled us to construct a snapshot of summer rearing of salmonids in Steamboat Creek. This snapshot of the abundance and distribution of steelhead (the dominant salmonid) within the basin and the evaluation of the stream habitat and landscape processes provides basic information to necessary to identify restoration opportunities within the basin.

The number of salmonids observed in the survey was: 12,142 age-0 steelhead, 2,806 age-1 steelhead, 911 age-2 steelhead and 443 cutthroat trout. The majority of the age-0 steelhead were in the tributary streams, with Little Rock Creek accounted for 33% of the basin total of age-0 steelhead and Little Rock Creek and Cedar Creek combined accounted for 56% of the age-0 steelhead in the basin. The number of age-0 steelhead was probably significantly below average because of a major storm in May. Based on data provided by past surveys of Canton Creek, a tributary of Steamboat Creek, the number of age-0 steelhead within the survey area are estimated to be lowest recorded in a decade.

This 2019 survey found that Age-1 steelhead were also most abundant in tributary streams, with Cedar Creek accounted for 32% of the age-1 steelhead in the basin. Counts of Age-1 steelhead within Cedar and Steelhead Creek combined accounted for 45% of the basin total.

Age-2 steelhead were distributed in both mainstem Steamboat Creek and its tributaries; the lower mainstem of Steamboat Creek from the mouth to lower falls accounted for 19% of the basin total. Big Bend Creek (a major tributary of Steamboat Creek) accounted for 18% of the basin total.

Cutthroat trout were distributed equally in the main stem and the tributaries. Twenty-two percent of the cutthroat in the basin were in Cedar Creek.

Introduction

The Frank and Jeanne Moore Steelhead Sanctuary, which was established in March 2019, created a 100,000 acres sanctuary and temperature refuge for steelhead trout (O. mykiss) and other native anadromous salmonids within the North Umpqua basin. This sanctuary also acts as key source of cold both Steamboat Creek and the North Umpqua River, itself.

During the summer of 2019 a snorkel survey of the mainstem and tributaries was completed by Charley and Andrew Dewberry, Alex Brereton, and Alan Bunce (Pacific Rivers). The survey

included the majority of the mainstem of Steamboat Creek and all the tributaries large enough and with access to steelhead trout.

These snorkel surveys enable us to construct a snapshot of summer rearing of salmonids in Steamboat 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 provides information necessary to the identification of 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. Also, we can begin to tease out the variety of life-history strategies of the steelhead in the basin. It also allows us to greater understand the factors affecting the abundance and distribution of the salmonids in the basin.

Study Area

Steamboat Creek is a major tributary of the North Umpqua River basin, located within the Western Cascades in Central Oregon (Figure 1). The drainage area is approximately 100,000 acres. Steamboat Creek is a strategically important producer of steelhead trout, coho salmon, chinook salmon and cutthroat trout within the North Umpqua drainage. The geology of the basin is dominated by weathered Tertiary volcanic rocks, and the dominant forest community is western Hemlock-Douglas fir.
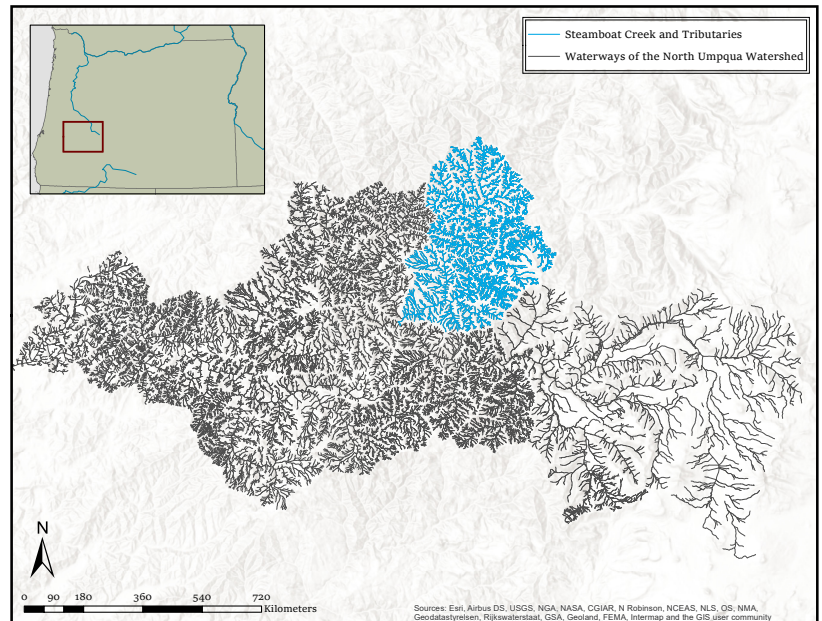

Fig. 1: Location of the Steamboat Creek Watershed within the North Umpqua Basin. Steamboat Creek and its tributaries (not including Canton Creek) are highlighted in blue.

Surveyed Reaches

During July and August of 2019, the snorkel survey of the basin was completed, with the majority of the mainstem of Steamboat Creek surveyed. The following reaches were included in the survey: the mouth to lower falls, Steelhead Creek to Singe Creek, and from below Reynolds to the headwaters.

The following tributaries of Steamboat Creek were surveyed: Big Bend Creek, Cedar Creek, City Creek, Deep Creek, E. Fork of Steamboat Creek, Horse Heaven Creek, Little Rock Creek, Reynolds Creek, Singe Creek, and Steelhead Creek (figure 2).

Methods

Snorkel surveys were conducted during July and August 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 was 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 very difficult. As a result, we elected to combine both species into these age categories. Age-2 steelhead were differentiated from age-2 cutthroat trout. Adult salmonids were observed in the survey, however, they were not counted. Refer to fig. 2 for a map of tributaries surveyed and table 1 for a complete account of distribution per stream reach.

Fig. 2: Surveyed tributary reaches within the Steamboat Creek watershed.

Results and Discussion

Salmonid Population Estimates

The snorkel survey data from the summer of 2019 are summarized in Table 1 and 2. These tables include the mainstem reaches as well as the tributary reaches. The number of salmonids observed in the survey was: 12,142 age-0 steelhead, 2,806 age-1 steelhead, 911 age-2 steelhead and 443 cutthroat trout.

Mainstem Stream Reach	Age 0 Steelhead	Age 1 Steelhead	Age 2 Steelhead	Cutthroat Trout	Total. Individuals
Mouth- Falls	60	117	177	20	374
Big Bend-Cedar	179	132	44	26	381
Steelhead to Singe	134	246	161	36	577
Headwaters	240	183	0	28	451
All Mainstem Reaches	613	678	382	110	1783

Tributary Reach	Age 0 Steelhead	Age 1 Steelhead	Age 2 Steelhead	Cutthroat Trout	Total. Individuals
Big Bend Creek	362	114	164	38	678
Cedar	2864	893	115	98	3970
City Creek	1278	125	15	5	1423
E. Fork Steamboat	26	12	0	34	72
Horse Heaven Creek	1281	116	24	10	1431
Little Rock Creek	3968	166	24	49	4207
Reynolds	639	241	47	47	974
Singe Creek	171	85	76	19	351
Steelhead Creek	921	363	64	33	1381
E. Fork Headwaters	19	13	0	0	32
All Tributary Reaches	11529	2128	529	333	14519

Table 1: All counts of individuals by stream reach, age, and species.

	Mainstem Steamboat Creek	All tributary Reaches	Total
Age 0 Steelhead	613	11529	12142
Age 1 Steelhead	678	2128	2806
Age 2 Steelhead	382	529	911
Cutthroat Trout	110	333	443
All Groups	1783	14519	16302

Table 2: Summary of 2019 survey counts of all Steelhead and Cutthroat groups in mainstem and tributary reaches of Steamboat Creek.

Age-0 Steelhead

The majority of the age-0 steelhead were in the tributary streams, with Little Rock Creek accounted for 33% of the basin total of age-0 steelhead and Little Rock Creek and Cedar Creek combined accounted for 56% of the age-0 steelhead in the basin. The number of age-0 steelhead was probably significantly below average because of a major storm in May. Based on data

collected over the last 10 years from surveys of Canton Creek, a tributary of Steamboat Creek the number of age-0 steelhead observed in 2019 was the lowest recorded in a decade.

Age-1 Steelhead

Age-1 steelhead were also most abundant in tributary streams. Cedar Creek alone accounted for 32% of the age-1 steelhead in the basin. Cedar and Steelhead Creek combined accounted for 45% of the basin total. The mainstem of Steamboat only accounted for 24% of the age-1 steelhead in the basin.

Age-2 Steelhead

Age-2 steelhead were distributed in both the mainstem and the tributaries. The lower mainstem from the mouth to lower falls accounted for 19% of the basin total. Big Bend Creek also accounted for 18% of the basin total. In the lower mainstem, most of the age-2 steelhead were in riffles, while the majority of age-2 steelhead were in pools in the tributaries.

Cutthroat Trout

Cutthroat trout were distributed about equally in the main stem and the tributaries. Twenty-two percent of the cutthroat trout in the basin were in Cedar Creek.

Density Analysis of Ages 0, 1, and 2 Steelheads

In addition, we analyzed the survey information by density. Steelhead age-0 were analyzed as density per square meter. Age-1 and age-2 Steelhead were analyzed as fish per habitat unit. This information can give a different perspective on the distribution.

Age-0 Steelhead

The very highest densities of age-0 steelhead were only found in short reaches of Cedar and Little Rock Creeks (fig. 3). Most other tributary reaches had high or medium densities. The mainstem generally had a low density of age-0 fish, mostly because of the large size of the habitat units. Some mainstem habitats had over 30 age-0 steelhead in them but because of the habitat size this was a low density. This was particularly true in the upper mainstem above City Creek. In general densities were higher in the tributaries than in the mainstem reaches.
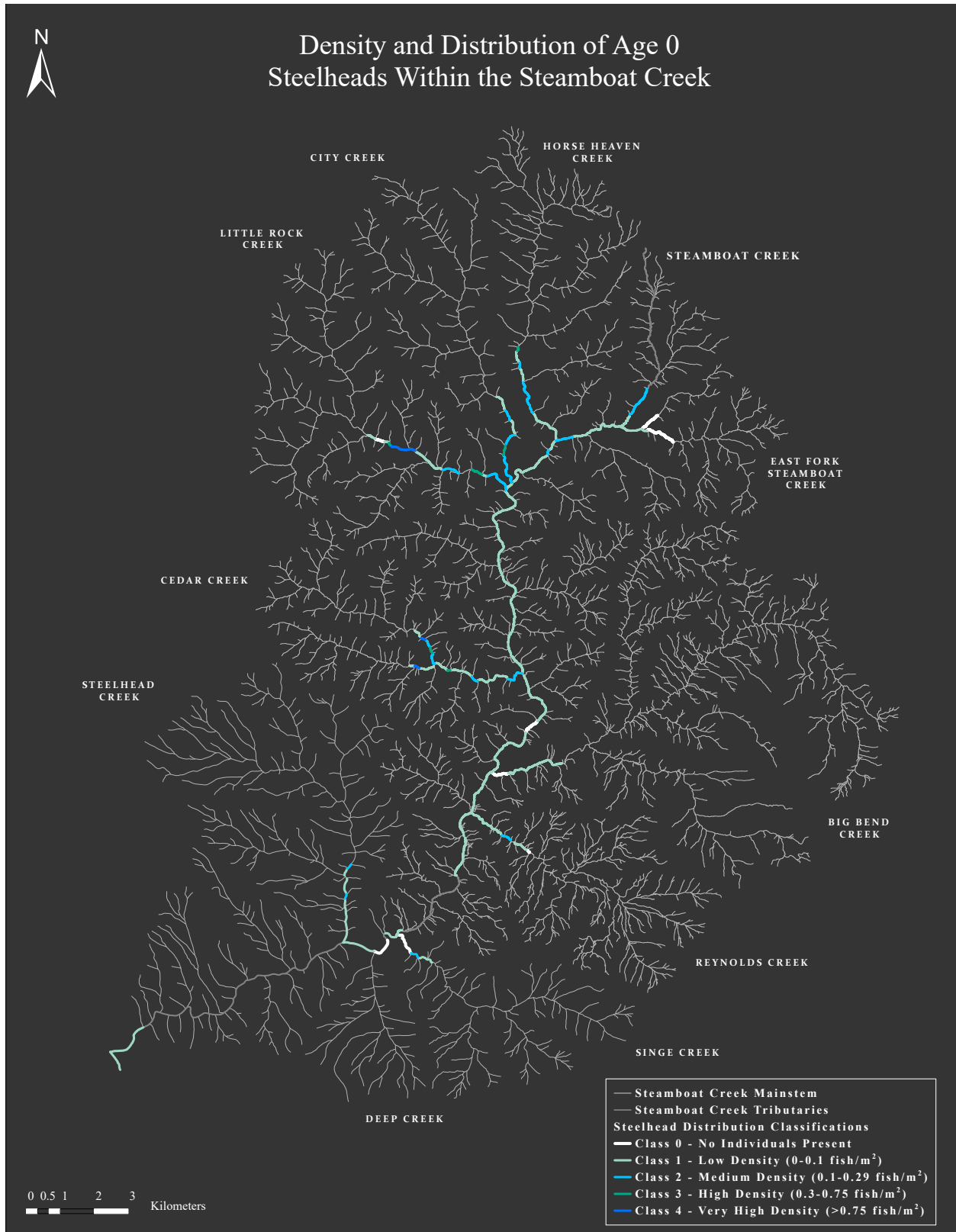
Fig. 3: Density and distribution of Age 0 Steelheads in the Steamboat Creek Watershed during the 2019 survey.

Age-1 Steelhead

Age-1 steelhead were distributed about equally throughout the basin in both the tributaries and the mainstem (fig. 4). The very highest densities were only found in short reaches in Steelhead and Cedar Creeks. Most densities were low or medium throughout the system.
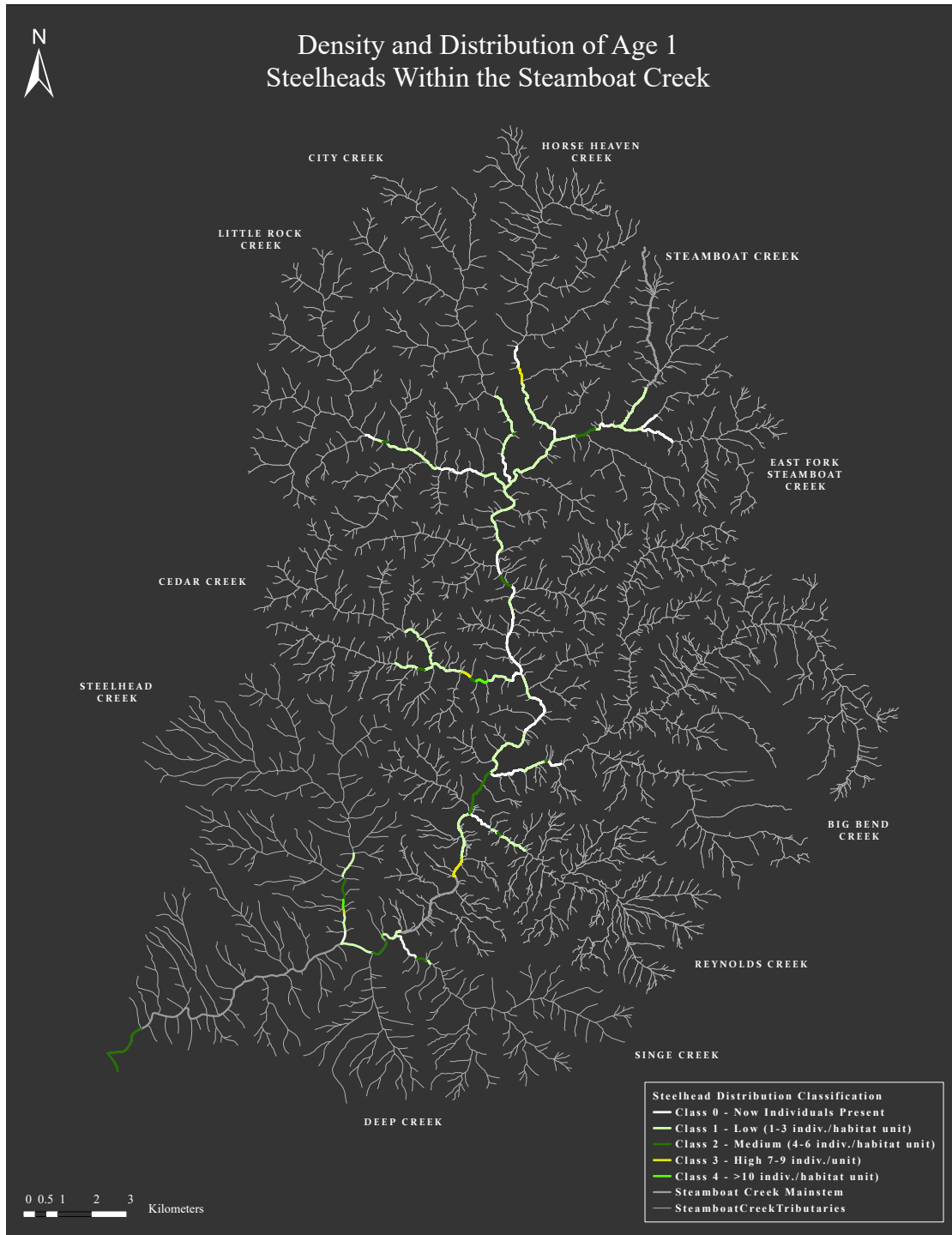

Fig. 4: Density and distribution of Age 1 Steelheads in the Steamboat Creek Watershed during the 2019 survey.

Age-2 Steelhead

Age-2 steelhead were predominantly located in the lower one-half of the mainstem. They were also far more common in the mainstem as a whole than in the tributaries. Most tributaries reaches had low densities of age-2 steelhead. However, the only very high reaches included a short reach of Singe Creek as well as mainstem reaches.
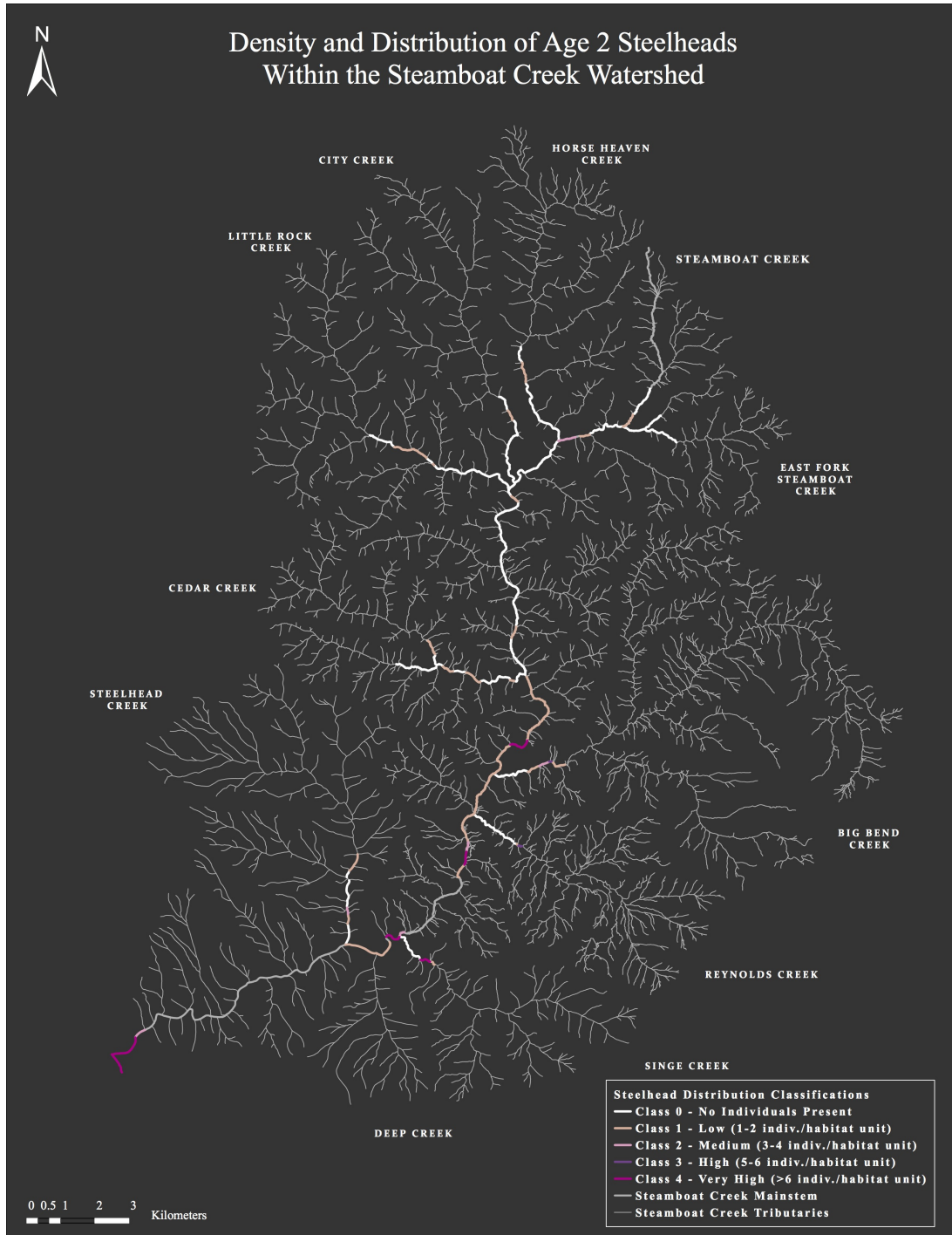

Fig. 5: Density and distribution of Age 2 Steelheads in the Steamboat Creek Watershed during the 2019 survey.

Summary

During the summer of 2019, a snorkel survey was conducted in the Frank and Jeanne Moore Steelhead Sanctuary. The survey included the majority of the mainstem Steamboat and the all the major tributaries to Steamboat Creek. Steelhead ages 0, 1, and 2 as well as Cutthroat Trout were counted. The population size of age-0 Steelhead is estimated to be well below average because of a major storm that occurred during May of 2019, but is still the largest age class present in the Steamboat Creek watershed. Distribution of individuals varied between ages classes, with tributaries hosting almost ten times as many individuals of all ages and species as did the surveyed portions of mainstem Steamboat Creek. Cedar Creek appears to be especially critical habitat for all three ages of Steelhead and Cutthroat trout.

A special thank you to 2019's dive crew for all of their hard work.

Bibliography

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