

Annual Report: Nestucca River Native Broodstock Monitoring – Juveniles.

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Introduction

In the spring of 2001, the Oregon Department of Fish and Wildlife (ODFW) adopted a proposal to collect approximately 70 wild winter steelhead females from the Nestucca River Basin for hatchery broodstock. As part of an effort to monitor the impact of this broodstock collection on the wild winter steelhead population in the Nestucca, ODFW's Western Oregon Rearing Project was given the task of monitoring trends in the abundance and distribution of juvenile steelhead in the basin. This report presents the results of the first year of this monitoring effort.

Methods

Study Design

We had a target of surveying juvenile steelhead rearing at between 30-35, one-kilometer long stream reaches in the Nestucca River Basin. Sites were randomly selected using a stream reach database maintained by ODFW's Coastal Salmonid Inventory Project. On the Little Nestucca River, candidate stream reaches included all areas accessible to steelhead above tidewater. On the main Nestucca River, candidate stream reaches included all areas accessible to steelhead above the confluence of the Nestucca River and Beaver Creek. In total, 373 km of stream channel fell within our snorkeling sample universe.

Once completed, the site selection process provided the geographic coordinates (i.e. latitude and longitude) of each of the candidate sites. We then produced topographic maps showing the location of each sample point. Field crews used a handheld geographic positioning system (GPS) to find the start and end of each survey reach.

Survey Methodology

Surveys began on August 1, 2001 and concluded on September 30, 2001. To conduct the surveys, a two-to-four person snorkel crew counted the number of 1+ juvenile steelhead, 1+ cutthroat trout, and all coho salmon in each of the sample reaches. 0+ juvenile cutthroat and steelhead (< 90 mm fork length) were not counted. Age 1+ trout that could not be identified to species were counted as unknown trout. To reduce problems associated with snorkeling in shallow or fast water habitat, only pools $\geq 6 \text{ m}^2$ in surface area and $\geq 40 \text{ cm}$ deep were

snorkeled. In smaller streams, crewmembers either alternated the pools that they snorkeled or one crewmember snorkeled the entire reach. In larger streams where one snorkeler could not effectively enumerate fish, surveys were conducted with snorkelers swimming side-by-side.

In all but two sites, snorkel methodology involved a single upstream pass through each pool. At the two largest mainstem sites, counts were made while swimming downstream. Counts of the number of juvenile coho, cutthroat, steelhead, unknown trout, chinook, blackside dace, and redbside shiner were recorded for each pool. After snorkeling, we ranked the underwater visibility of each pool during the snorkel count on a scale of 0 to 3 where: 0 = not snorkelable due to extremely high hiding cover or zero water visibility; 1 = high amount of hiding cover or poor water clarity; 2 = moderate amount of hiding cover or moderate water clarity neither of which were thought to impede accurate fish counts; and 3 = little hiding cover and good water clarity. Only pools with a visibility rank of two or three were used in data analysis. We measured the maximum pool depth and estimated the length and average width of all snorkeled pools.

To provide some quality control of the snorkel data, and to provide information on temporal changes in abundance during the course of the sampling season, supervisory staff had a goal of resurveying a random sample of 10 to 20 percent of the sites surveyed.

Results and Discussion

Summary data for each sample site are shown in Appendix A. We visited a total of 34 sites during the summer of 2001 (Figure 1). One visited site (#7100) had to be dropped due to poor water visibility, resulting in 33 snorkeled reaches. Age 1+ juvenile steelhead were observed at all 33 sites, whereas age 1+ cutthroat were observed at 31 sites and juvenile coho were observed at 22 sites. A total of 2,510 steelhead, 1,097 cutthroat, 331 unknown trout, and 14,105 coho were observed in the 584 snorkeled pools. We observed average pool densities (fish/ m²) of 0.07 for steelhead, 0.04 for cutthroat, 0.01 for unknown trout, and 0.31 for coho. The average number of fish/meter of stream sampled was 0.07 for steelhead, 0.03 for cutthroat, .01 for unknown trout, and 0.42 for coho. Multiplying these numbers by the total length of stream in our sampling universe results in an estimate of 27,568 aged 1+ steelhead, 12,220 age 1+ cutthroat, 3,632 age 1+ unknown trout, and 154,765 juvenile coho.

Caution should be used when reviewing these numbers. While the estimate for coho salmon is probably close to the actual population of juvenile coho in the Nestucca Basin, the numbers presented for trout are not. Juvenile coho tend to live in smaller streams where snorkel counts are more easily conducted. This and the fact that they generally do not hide from snorkelers and primarily reside in pools results in fairly accurate snorkel counts for juvenile coho. Juvenile trout, on the other hand are often found in larger streams, are more

secretive, and can reside in large numbers in riffles and rapids. As a result, the juvenile trout data collected by this study represent an index of their abundance that should only be used in conjunction with future data collected in the Nestucca for the purpose of population trend detection.

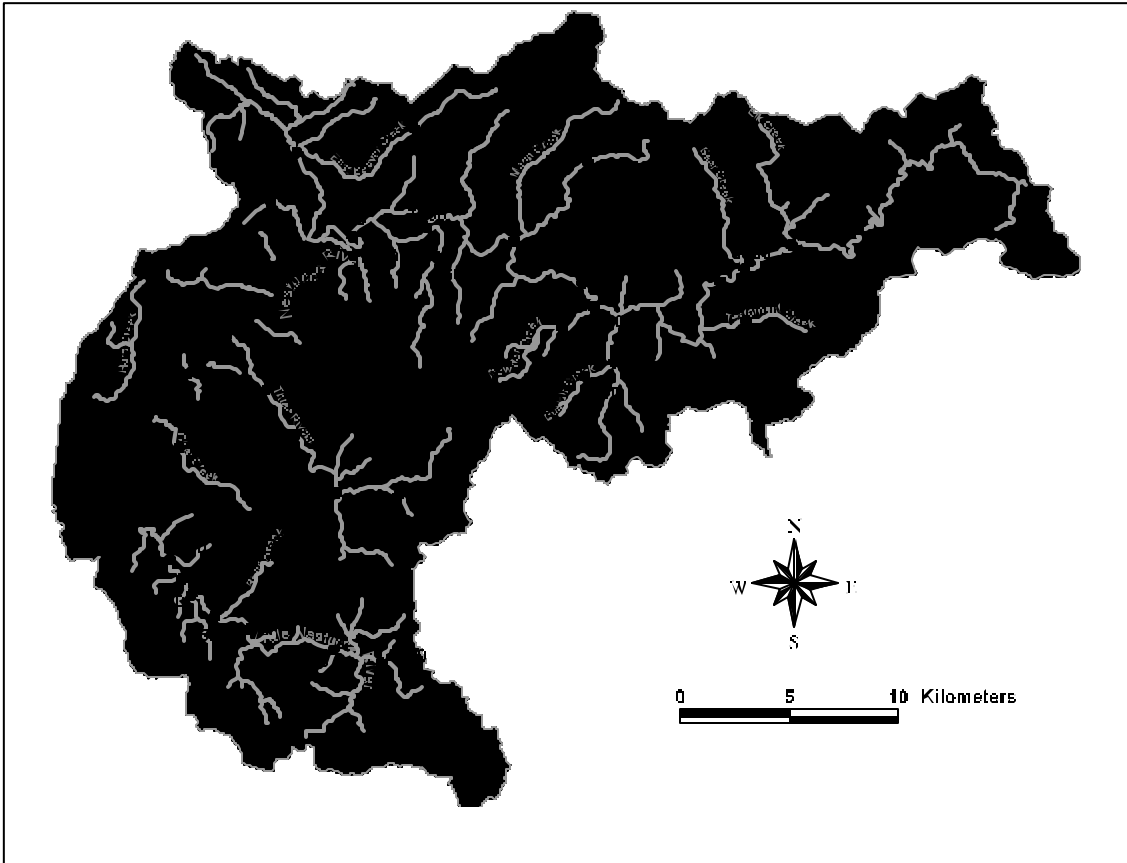


Figure 1. Location of sample stream reaches snorkeled for juvenile steelhead abundance in the Nestucca River Basin, 2001. Numbers next to are site numbers for reference to Appendix A. Gray highlighted stream areas depict candidate stream segments.

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Appendix A. Summary data for sites snorkeled in the Nestucca River Basin during August and September 2001.

Site Number	Survey Length (m)	Number of Pools	Pool Surface Area (m ²)	Number of Fish Observed in Pools			
				Coho	Cutthroat	Steelhead	Unknown Trout
107	1000	24	727	826	19	74	2
249	1000	3	40	0	2	1	1
331	1000	15	222	0	10	4	1
932	1000	12	140	0	3	10	5
5100	1000	37	1047	425	18	68	5
5200	1000	13	2278	219	24	192	10
5400	1000	15	3143	814	30	155	1
5500	1000	25	773	713	64	91	6
5600	1000	18	4691	215	17	13	8
5700	1000	12	5916	549	21	4	7
5800	545	6	84	0	20	3	0
5900	1000	24	1392	552	21	31	16
6100	1000	9	4925	0	11	18	10
6200	1000	12	6668	0	3	1	2
6300	1000	25	4441	0	45	147	8
6400	1000	21	2363	49	39	144	23
7100	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7200	1000	21	1128	923	42	233	0
7300	1000	7	89	0	0	5	0
7500	1000	5	22375	0	57	97	47
7600	1000	17	393	108	35	53	1
7700	1000	3	31500	3	143	236	64
7800	1000	38	2026	644	102	57	43
7900	1000	8	4289	58	11	41	24
8000	1000	8	6534	53	31	112	10
8100	1000	23	793	414	40	82	1
8200	1000	18	622	391	16	22	17
8300	1000	11	6473	73	61	39	5
8400	1000	28	861	0	72	44	7
8500	1000	40	1593	0	1	101	0
8700	1000	12	2165	1030	30	83	0
8800	1000	31	2811	2430	33	123	1
8900	1000	17	2703	1421	35	148	0
9000	1000	26	4224	2195	41	78	6