THE OREGON PLAN *for Salmon and Watersheds*

Abundance Monitoring of Juvenile Salmonids In Oregon Coastal Streams, 2002-2003.

Report Number: OPSW-ODFW-2004-1

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Executive Summary

This report summarizes the results of two studies currently being conducted by the Western Oregon Rearing Project. The first study (Chapter 1) involves coast-wide sampling of the abundance of juvenile coho in coastal streams. In both 2002 and 2003 the Mid Coast and South Coast monitoring areas had significantly higher densities of coho than other areas within 1st-3rd order streams. In comparisons of brood cycles (1999 vs. 2002, 2000 vs. 2003) significant increases in juvenile coho densities occurred in all MA's in the later broods (2002 and 2003), relative to the 1999 and 2000 broods. Frequency of occurrence of coho also increased between brood cycles in some MA's. In the 1999 versus 2002 comparison, the North Coast, Mid-Coast, and South Coast MA's all had significantly higher pool occupancy rates in 2002 compared to 1999. In the 2000 versus 2003 comparison, higher pool occupancy occurred in the Mid Coast and South Coast in 2003 than in 2000.

The relationship between adult spawners/mile and juvenile coho/m^2 the following year is stronger in the Mid-South Coast, South Coast, and Umpqua, than in the North Coast and Mid-Coast. Review of North Coast and Mid Coast MA's. Slopes from regressions of juvenile coho/m^2 on adult spawners/mile indicate greater juvenile survival in the South Coast relative to other sites over several years. Steelhead were generally more widespread in 2003 than 2002 but there was no consistent pattern of one site having lower and one site having higher frequency of occurrence over the two years. There were no significant differences in mean densities of steelhead among areas in 2002, but in 2003 the 1st-3rd order Umpqua sites had lower densities than 1st-3rd order sites in the other areas. In general, higher mean percent occurrence of steelhead was higher in pools of higher order streams than in pools of 1st-3rd order streams.

Chapter 2 describes results from the summers of 2002 and 2003 of a study in Smith River on the relative utility of electrofishing surveys in tributary streams compared with and basin-wide snorkel surveys as a way of monitoring juvenile salmonid population trends. The presence of juvenile fish was high, with coho, cutthroat ≥ 90 mm, and trout < 90 mm occurring in over 70% of sites over the two years. Juvenile coho were the most widespread species in both years. Steelhead ≥ 90 mm were less widespread, occurring in < 45% of sites over both years. In both years, population estimates showed that juvenile coho were the most abundant, followed in order by trout < 90 mm, cutthroat ≥ 90 mm, and steelhead ≥ 90 mm. Similar to previous years, basin-wide snorkel surveys in Smith River found greater frequency of occurrence and higher density all three species of salmonids in the tributary stream reaches. Of trout ≥ 90 mm that were classified by divers as either cutthroat or steelhead in 2002, 67.4% were identified as cutthroat and 32.6% as steelhead. In 2003 these proportions were 55.6% and 44.4% for cutthroat and steelhead, respectively, and are slight underestimates of cutthroat and slight overestimates of steelhead relative to direct counts from electrofishing. For sites where both snorkel and electrofishing surveys were conducted in 2002, divers observed 78% of the coho density estimated by electrofishing, but in 2003 electrofishing density detected 83% of the density estimated by snorkeling. Electrofishing density estimates for steelhead were 34% and 16% of that observed by snorkeling in 2002 and 2003, respectively. Snorkel and electrofishing surveys detected equal numbers of sites with at least one coho in both

years, and in 2002 for steelhead, snorkeling surveys observed at least one fish at more sites than electrofishing surveys.

Chapter 1: Abundance Indices of Juvenile Coho Salmon, Steelhead, and Cutthroat Trout in Oregon Coastal Streams in the Summers of 2002 and 2003.

Introduction

In the summer of 1998, as part of the Oregon Plan for Salmon and Watersheds, the Oregon Department of Fish and Wildlife (ODFW) began a project to monitor juvenile coho salmon (*Oncorhynchus kisutch*) in Oregon coastal streams. In the summer of 2002 this project was expanded to include juvenile steelhead (*Oncorhynchus mykiss*) and cutthroat trout (*Oncorhynchus clarkii*). The project is designed to monitor trends in abundance of juvenile salmonids rearing in five coastal Monitoring Areas (hereafter referred to as MA's; Figure 1). This report summarizes the data collected during the summers of 2002 and 2003, and for coho salmon compares it to data previously collected.

Methods

Study Design

Sites were randomly selected using Environmental Mapping and Assessment Program (EMAP) protocol (Stevens and Olsen 1999). This protocol involves the use of a Geographic Information System incorporating a 1:100,000 digital stream network of juvenile salmonid rearing distributions to insure an unbiased and spatially balanced selection of sample sites across each MA. In previous years we used only the network of known coho distributions within 1^{st} – 3^{rd} order stream segments for site selection. In 2002 the site coverage was expanded to include higher order stream segments for better spatial balance of steelhead distributions. Within each MA we had a sampling effort target of 40-50 one-kilometer long stream reaches in 1^{st} – 3^{rd} order tributary streams, and 10-15 one-kilometer long stream reaches in 4^{th} – 5^{th} order mainstem streams.

Survey Methodology

Once completed, the EMAP site selection process provided the geographic coordinates (i.e. latitude and longitude) of each of the candidate sites. With this information, we produced topographic maps showing the location of each sample point. Field crews used a handheld Geographic Positioning System to find the approximate locations of the EMAP selected sample point, and then established a 1 km long survey reach that encompassed the sample point.

Snorkeling was conducted from August 1 through September 30 in both years. For tributary sites, a two-person snorkel crew either alternated the pools that they snorkeled or one crewmember snorkeled the entire reach. In those few instances where tributary sites were too wide for one snorkeler to effectively survey, crewmembers snorkeled side-by-side. For mainstem sites, a four-person crew snorkeled side-by-side.

At tributary sites, snorkel methodology involved a single upstream pass through each pool. At mainstem sites, crews snorkeled either upstream or downstream depending on water velocity. At each site, counts were made of the number of juvenile coho, steelhead $\geq$ 90mm, and cutthroat $\geq$ 90mm. After snorkeling, the underwater visibility of each pool during the snorkel count was ranked 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 reduce problems associated with snorkeling in shallow or fast water habitat, only pools $\geq$ 6 m^2 in surface area and $\geq$ 40 cm deep were snorkeled.

Where poor water clarity or quality prohibited standardized snorkel surveys at tributary sites, electrofishing was used to provide data on the percent of pools per site that contained juvenile coho, and the percentage of sites that had at least one juvenile steelhead and/or cutthroat. Electrofishing was conducted using Smith-Root model 12-B backpack electrofishers following NMFS electrofishing guidelines (NMFS 2000). A single upstream electrofishing pass was made in each pool meeting the size and depth criteria for conducting snorkel surveys. In previous years we terminated the electrofishing pass within a pool once a coho was captured. Starting in 2002 we continued sampling the pools within a site until an individual juvenile steelhead and cutthroat were captured, or until the pass was completed. Once a steelhead and cutthroat were captured at a site, subsequent pools were only electrofished for determining coho abundance. No block nets are used for this sampling.

To provide quality control of the snorkel data and information on temporal changes in abundance during the course of the sampling season, supervisory staff had a goal of resurveying a random sample of 10-20% of the tributary sites surveyed in each Monitoring Area.

Data Analysis

For each species, three basic metrics were used to analyze the data: 1) the percentage of pools that contained at least one fish; 2) the percentage of sites that had at least one fish; and 3) the average number of fish/m^2. For juvenile coho, density data are reported as both the average of each site, and as an average for each MA. For juvenile steelhead and cutthroat trout, density data are presented only as MA averages. Individual site density averages are not presented for steelhead and cutthroat because observation probabilities for these species are highly variable and can lead to misleading conclusions if comparisons are made between survey sites.

For data summaries, we used the same randomly selected sites for each species, but analyzed 1^{st} – 3^{rd} sites and 4^{th} – 5^{th} order sites as subsets within each MA. In the South Coast there is a more distinct rearing distribution of coho and trout. The spatial balance of site selection was maintained for South Coast coho analysis by using the randomly selected tributary sites (1^{st}-3^{rd} order) from coho distributions, and the randomly selected 4^{th} – 5^{th} order sites from steelhead distributions. Therefore the two South Coast coho data subsets were comparable to the subsets for the other monitoring areas, and the 4^{th} – 5^{th} order sites are a composite of the 4^{th} – 5^{th} order steelhead sites described below. Although steelhead and cutthroat data are reported for these South Coast coho sites, the sites are considered spatially unbalanced for steelhead distributions (and unknown for cutthroat), and therefore are not used in comparative analyses with other MA's. Instead, the spatial balance of sites selection (from randomly selected sites of steelhead distribution) was maintained by first dividing sites into Rogue basin and Non-Rogue basin subsets, then into 1^{st} – 3^{rd} and 4^{th} – 5^{th} order subsets, as for coho above. In

2002, no juvenile salmonid data are reported for the South Coast 4th-5th order streams, due to forest fire damage that resulted in a spatially unbalanced sampling.

To compare means, we followed the methods outlined by Stevens (2002), and calculated sample variances from which Z-values were obtained (Snedecor and Cochran 1980). We regressed the number of adult coho found on spawning surveys on the number of juvenile coho observed the following summer, then used an analysis of covariance (ANCOVA; Neter and Wasserman 1974) to test slopes and intercepts to compare inter-annual differences in abundance. In all analyses, we considered comparisons to be statistically significant if *p*-values were ≥ 0.05.

Results

Site Visitation

A summary list of sample sites for the summers of 2002 and 2003 for each MA are given in Appendices 1.1 and 1.2., and the location of candidate sites for the two years are shown in Appendices 2.1-2.6. The South Coast contained the most tributary sites that were sampled (snorkeled or electrofished), and the Mid-South Coast contained the fewest (Table 1). In 2002, the Mid-South Coast and Umpqua had the highest number of sites that could not be sampled, primarily due to lack of water, and site access denial was highest in the Mid-South Coast and lowest in the North Coast. In 2003 there were fewer sites that could not be sampled and access denial decreased in all areas except the Mid Coast.

Juvenile Salmonid Frequency of Occurrence

The spatial relationships between sites for salmonid frequency of occurrence are plotted as maps in Appendices 3.1-3.10. The percentage of pools at each sample site containing at least one juvenile fish for each species in each MA is shown in Figures 2-23. The percentage of sites that contained at least one juvenile fish for each species is summarized in Table 2, and the results of tests of significance (Z statistic *p*-values) between monitoring areas in the mean percentage of pools per site that contained juvenile salmonids are given in Table 3.

Coho

Coho occurred in 66-88% of the 1st-3rd order sites over the two years, and were more widespread among Mid Coast sites and least widespread among Umpqua sites (Table 2). Within the 1st-3rd order sites of an MA over the two years, the mean percent of pools containing coho ranged between 50% (Umpqua 2003) to 69% (Mid Coast 2003). In 2002, the only detectable difference in mean percent occurrence between the 1st-3rd order sites, were the comparisons between the Umpqua and North Coast, and between the Umpqua and Mid Coast (Table 3). Coho had lower occurrence in 4th-5th order streams, with mean percent of pools containing coho ranging between 7% (Umpqua 2003) and 68% (Mid-South Coast 2003).

Table 4 shows the results of tests for differences between the mean percentage of pools per site that contained juvenile coho in the same brood cycle (1999 and 2002, and 2000 and 2003). In the 1999 versus 2002 comparison, the North Coast, Mid-Coast, and

South Coast MA's all had significantly higher pool occupancy rates in 2002 compared to 1999. In the 2000 versus 2003 comparison, higher pool occupancy occurred in the Mid Coast and South Coast in 2003 than in 2000.

Steelhead

Steelhead occurred in 43-83% of the 1st-3rd order sites (excluding South Coast sites) over the two years, and were generally more widespread in 2003 than 2002 (Table 2). There was no consistent pattern of one site having lower and one site having higher occurrence over the two years. Steelhead were widespread among the South Coast sites selected from steelhead distributions, occurring in 88% and 98% of sites in the non-Rogue and Rogue basins, respectively. Within the 1st-3rd order sites of an MA over the two years, the percent of pools containing steelhead ranged between 13% (Umpqua 2002) to 46% (North Coast 2003). In 2002, the 1st-3rd order Umpqua sites had lower mean percent of pools containing steelhead than either the North Coast or Mid Coast sites, and in 2003 the Umpqua had lower mean percent of pools containing steelhead than all other sites. There were no differences between 4th-5th order sites (Table 3). In general, pools within sites of larger order streams had higher mean percent occurrence of steelhead than pools in 1st-3rd order streams. In 2003, steelhead occurred more often within pools of South Coast Non-Rogue sites than the other MA's (Table 3).

Cutthroat

Cutthroat occurred in 61-97% of the 1st-3rd order sites (excluding South Coast sites) over the two years, with no consistent pattern between the two years (Table 2). Nor was there a consistent pattern of one site having lower and one site having higher occurrence over the two years. Cutthroat were widespread within the Non-Rogue South Coast sites selected from steelhead distributions, but had a more limited distribution in Rouge basin sites. Within the 1st-3rd order sites of an MA over the two years, the percent of pools containing steelhead ranged between 20% (Umpqua 2003) to 47% (North Coast 2003). As with steelhead for both years, the 1st-3rd order Umpqua sites had lower mean percent of pools containing cutthroat than either the North Coast or Mid Coast sites, but there were no differences between 4th-5th order sites (Table 3). In most cases, pools within sites of larger order streams had higher mean percent occurrence of cutthroat than 1st-3rd order streams. In 2003, cutthroat occurred less often within pools of in the South Coast Rogue sites than the other MA's (Table 3).

Table 1. The status of sites in coastal Monitoring Areas that were candidates for random juvenile salmonid surveys in the summers of 2002 and 2003. For the South Coast the sites were divided into [1] coho sites, [2] steelhead non-Rogue basin sites, and [3] steelhead Rogue basin sites. Note that data for 4th-5th order sites for South Coast coho are not listed but are the total of the Non-Rogue and Rogue steelhead sites.

	Sampled			Not Sampled							
	Snorkeled		Electro-fished	Could Not Be Sampled		Above Barrier		Access Denied		Not Visited	
Monitoring Area	1st - 3rd order	4th - 5th order	1st - 3rd order	1st - 3rd order	4th - 5th order	1st - 3rd order	4th - 5th order	1st - 3rd order	4th - 5th order	1st - 3rd order	4th - 5th order
2002											
North Coast	30	9	7	7	1	2	0	5	0	0	1
Mid Coast	40	12	1	2	0	5	0	6	0	1	1
Mid-South Coast	24	12	3	8	0	4	0	13	0	4	0
Umpqua	24	11	4	8	2	4	2	9	0	3	9
South Coast[1]	44	-	3	5	-	2	-	7	-	2	-
2003											
North Coast	36	9	1	5	1	2	0	2	1	0	0
Mid-Coast	38	12	1	3	0	2	0	9	5	0	0
Mid-South Coast	32	9	4	1	0	1	0	8	9	2	1
Umpqua	33	12	2	2	1	0	0	2	2	1	0
South Coast[1]	39	-	0	9	-	2	-	5	-	5	-
South Coast[2]	42	6	0	2	0	1	0	2	1	0	0
South Coast[3]	21	9	3	8	2	3	0	2	2	5	1

Table 2. The occurrence of juvenile salmonids observed by snorkeling or electrofishing in coastal Monitoring Areas in 2002 and 2003. For the South Coast the sites were divided into [1] coho sites, [2] steelhead non-Rogue Basin sites, and [3] steelhead Rogue Basin sites. sthd=steelhead and cutt=cutthroat. Values in italics for South Coast sites are from spatially unbalanced site selection.

Monitoring Area	Percent of sites with at least one pool containing Juvenile Fish						Mean percent (and 95% CI) of pools per site with Juvenile Fish						Median percent of sites containing Juvenile Fish					
	1st - 3rd order			4th - 5th order			1st - 3rd order			4th - 5th order			1st - 3rd order			4th - 5th order		
	coho	sthd	cutt	coho	sthd	cutt	coho	sthd	cutt	coho	sthd	cutt	coho	sthd	cutt	coho	sthd	cutt
2002																		
North Coast	78	71	88	67	56	78	56(8)	37(9)	47(8)	51(24)	41(18)	49(15)	59	25	56	50	40	55
Mid Coast	88	78	93	75	50	92	68(10)	38(7)	36(6)	39(19)	23(15)	35(14)	85	35	34	27	4	31
Mid-South Coast	81	74	85	83	67	75	66(13)	33(10)	45(10)	49(20)	36(17)	28(13)	100	29	45	46	30	27
Umpqua	71	43	61	55	64	73	60(11)	13(7)	22(8)	42(24)	38(18)	33(15)	88	2	18	43	33	25
South Coast[1]	79	*77*	*38*	-	-	-	67(10)	*42(6)*	*10(4)*	-	-	-	93	*36*	*0*	-	-	-
2003																		
North Coast	78	83	97	56	78	89	67(11)	46(9)	46(9)	45(29)	64(25)	73(22)	85	45	41	27	89	89
Mid Coast	87	79	95	67	58	83	69(9)	38(7)	33(6)	34(16)	37(15)	40(9)	79	39	30	20	24	89
Mid-South Coast	72	66	77	89	89	89	62(12)	28(9)	29(7)	68(17)	42(13)	30(7)	88	22	26	80	46	45
Umpqua	66	77	86	25	67	58	50(11)	26(5)	20(6)	7(8)	31(17)	23(12)	53	23	14	0	23	33
South Coast[1]	74	*87*	*69*	36	-	-	63(10)	*48(8)*	*26(7)*	24(17)	-	-	95	*43*	*22*	0	-	-
South Coast[2]	*29*	95	88	-	100	100	*8(4)*	68(6)	43(7)	-	84(11)	93(8)	*0*	80	40	-	75	100
South Coast[3]	*25*	88	29	-	78	44	*15(11)*	53(14)	6(4)	-	57(24)	24(21)	*0*	55	0	-	78	0

Table 3. *P*-values for tests of significance (Z statistic) for comparisons of the mean percentage of pools per site that contained juvenile salmonids for coastal Monitoring Areas sampled in 2002 and 2003. Significant differences are bolded. NC= North Coast, MC=Mid Coast, MS=Mid-South Coast, UMP=Umpqua, and SC-NR=South Coast Non-Rogue. For the South Coast in 2003 the sites were divided into [1] coho sites, [2] steelhead non-Rogue Basin sites, and [3] steelhead Rogue Basin sites.

	1st-3rd order streams					4th-5th order streams				
Monitoring Area	**NC**	**MC**	**MS**	**UMP**	**SC-NR**	**NC**	**MC**	**MS**	**UMP**	**SC-NR**
Coho 2002										
Mid Coast	0.0910					0.4263				
Mid-South Coast	0.1933	0.8916				0.4335	0.8916			
Umpqua	0.5617	0.3199	0.4606			0.4573	0.3199	0.4606		
South Coast[1]	0.1189	0.9053	0.9743	0.3805		-	-	-	-	
Coho 2003										
Mid Coast	0.7973					0.4190				
Mid-South Coast	0.5853	0.5188				0.4300	0.4718			
Umpqua	**0.0301**	**0.0199**	0.1308			0.3691	0.3871	0.3502		
South Coast[1]	0.6053	0.5322	0.9433	0.0891		0.4277	0.4686	0.3859	0.9045	
Steelhead 2002										
Mid Coast	0.8031					0.1986				
Mid-South Coast	0.5414	0.3535				0.3970	0.5602			
Umpqua	**0.0001**	**0.0000**	0.3069			0.4234	0.5787	0.4707		
Steelhead 2003										
Mid Coast	0.1752					0.3829				
Mid-South Coast	**0.0058**	0.0849				0.3753	0.4242			
Umpqua	**0.0001**	**0.0046**	**0.0176**			0.3928	0.4581	0.4389		
South Coast[2]	**0.0000**	**0.0000**	**0.0000**	**0.0000**		0.3654	0.4053	0.3936	0.4231	
South Coast[3]	0.5642	0.1160	**0.0084**	**0.0011**	**0.0241**	0.4257	0.5224	0.4939	0.3569	0.4992
Cutthroat 2002										
Mid Coast	**0.0355**					0.3992				
Mid-South Coast	0.7962	1.8858				0.3900	0.4236			
Umpqua	**0.0000**	**0.0048**	**0.0003**			0.4021	0.4418	0.4784		
Cutthroat 2003										
Mid Coast	**0.0089**					0.3503				
Mid-South Coast	**0.0010**	0.3340				0.3437	0.3668			
Umpqua	**0.0000**	**0.0024**	0.0624			0.3633	0.4054	0.4419		
South Coast[2]	0.5327	**0.0351**	**0.0042**	0.3265		0.3469	0.3731	0.3953	0.4201	
South Coast[3]	**0.0000**	**0.0000**	**0.0000**	**0.0001**	**0.0000**	0.3985	0.4771	0.5459	0.6222	0.3793

Table 4. Differences in the mean percentage of pools per site containing juvenile coho at 1st - 3rd order sites sampled in each coastal Monitoring Area for two brood cycles (1999 and 2002, and 2000 and 2003).

Comparison	Difference in means	*P* for difference
Brood Cycle 1999 vs. 2002		
North Coast	31.6	<0.05
Mid-Coast	37.0	<0.05
Mid-South Coast	7.8	0.3981
Umpqua	11.7	0.1717
South Coast	33.0	<0.05
Brood Cycle 2000 vs. 2003		
North Coast	8.6	0.2725
Mid-Coast	17.7	<0.05
Mid-South Coast	3.5	0.6731
Umpqua	0.2	0.9764
South Coast	21.7	<0.05

Juvenile Salmonid Density

Coho

The average density of juvenile coho in pools at each sample site is shown for each MA in Figures 24-28. For both 2002 and 2003 the percentage of sites that had juvenile coho densities $\geq$0.7 fish/m^2 were greatest in the Mid-South Coast (57% and 50% for 2002 and 2003, respectively) and lowest in the Mid-Coast (11% and 19% for 2002 and 2003, respectively; Table 5). In both years the Mid-South Coast and South Coast MA's had mean densities of juvenile coho that were significantly higher than the other MA's (Tables 5-6). Densities in 4th-5th order streams were lower than in tributary streams in both years, but did not differ among MA's for either year (Table 6).

The results of Z-tests for differences in the mean density of juvenile coho observed for the same brood cycles (1999 and 2002 broods, and 2002 and 2003 broods) are summarized in Table 7. Significant increases in juvenile coho densities occurred in all MA's in the later broods (2002 and 2003), relative to the 1999 and 2000 broods. The spatial relationships between sites for coho density are plotted as maps in Appendices 4.1-4.6.

Steelhead

In general, there were no significant differences in mean densities of steelhead between MA's in 2002 with the exception of the Umpqua having lower densities than the North Coast (Tables 5 and 6). In 2003 the 1st-3rd order Umpqua sites had lower densities than the other MA's, and the North Coast had higher densities than the Mid Coast. In 2003 Non-Rogue basin sites had greater steelhead densities than Mid Coast, Mid-South Coast, or Umpqua sites, and Rogue basin sites had greater mean densities

that Mid Coast, Mid-South Coast, or Umpqua sites. There were no differences in mean density in comparisons among 4^{th}-5^{th} order sites.

Cutthroat

In 2002 the Umpqua MA had lower cutthroat mean densities than the North or Mid-South Coast MA's. In 2003 the North Coast had higher mean densities than all MA's except the Mid Coast and Mid-South Coast (Tables 5-6). Cutthroat densities were negligible in South Coast Rogue basin sites. There were no differences in mean density in comparisons among 4^{th}-5^{th} order sites.

Juvenile Coho Population Trend and Comparison to Adult Abundance

The spatial relationships between sites for coho densities are plotted as maps in Appendices 4.1-4.6. Figures 29-33 show changes in the estimated number of adult coho/mile that spawned in each MA from 1997 through 2002, and indices of abundance of the juvenile coho produced by these spawners. In general, there is a positive numerical relationship between increasing juvenile abundance with higher number of adult spawners. The relationship between adult spawners/mile and juvenile coho/m^2 the following year is stronger in the Mid-South Coast, South Coast, and Umpqua than in the North Coast and Mid-Coast (Figure 34). For the Mid South MA, the relationship was not significant. Review of North Coast and Mid Coast MA's (Figures 29 and 30) suggests a poor relationship between the spawner broods in 2001-2002 and juvenile indices in 2002-2003, possibly resulting from reduced egg-to-parr survival of coho in the two northern MA's, relative to the three southerly MA's.

Also noteworthy is the pattern of high density of the 2001 and 2002 broods of juvenile coho produced by the relatively low abundance of adult spawners in the South Coast. Future data will hopefully clarify whether the apparent high egg-to-parr survival in the South Coast was an anomaly over two consecutive years, or indicates inherently higher survival rates in the South Coast compared to other MA's.

Table 5. Density (fish/m^2) of juvenile fish observed by snorkelers in coastal Monitoring Areas in 2002 and 2003. For the South Coast the sites were divided into [1] coho sites, [2] steelhead non-Rogue Basin sites, and [3] steelhead Rogue Basin sites. sthd=steelhead and cutt-cutthroat. Values in italics for South Coast sites are from spatially unbalanced site selection.

Monitoring Area	Percent of sites with an mean density ≥ 0.7 coho/m^2		Mean density (95% CI) of Juvenile Fish						Median density of Juvenile Fish					
	1st - 3rd order	4th - 5th order	1st - 3rd order			4th - 5th order			1st - 3rd order			4th - 5th order		
			coho	sthd	cutt	coho	sthd	cutt	coho	sthd	cutt	coho	sthd	cutt
2002														
North Coast	22	0	0.39(0.13)	0.04(0.01)	0.06(0.02)	0.04(0.04)	0.01(0.00)	0.00(0.00)	0.15	0.02	0.04	0.00	0.00	0.00
Mid Coast	11	0	0.29(0.08)	0.03(0.01)	0.03(0.01)	0.01(0.01)	0.03(0.01)	0.00(.000)	0.19	0.02	0.01	0.00	0.02	0.00
Mid-South Coast	57	0	0.85(0.31)	0.03(0.02)	0.05(0.03)	0.02(0.02)	0.13(0.01)	0.00(0.00)	0.72	0.01	0.02	0.00	0.07	0.00
Umpqua	22	0	0.41(0.34)	0.02(0.01)	0.01(0.01)	0.05(0.05)	0.12(0.05)	0.02(0.01)	0.35	0.00	0.00	0.00	0.09	0.02
South Coast[1]	50	-	1.19(0.29)	*0.08(0.04)*	*0.00(0.00)*	-	-	-	0.75	0.03	0.00	-	-	-
2003														
North Coast	21	0	0.44(0.26)	0.06(0.02)	0.07(0.03)	0.08(0.09)	0.01(0.01)	0.01(0.01)	0.25	0.05	0.03	0.01	0.01	0.01
Mid Coast	19	0	0.34(0.10)	0.03(0.01)	0.02(0.01)	0.00(0.00)	0.01(0.01)	0.00(0.00)	0.15	0.01	0.01	0.00	0.00	0.01
Mid-South Coast	50	0	1.07(0.43)	0.04(0.02)	0.04(0.02)	0.03(0.02)	0.00(0.00)	0.01(0.01)	0.70	0.01	0.02	0.02	0.00	0.00
Umpqua	26	0	0.43(0.12)	0.01(0.00)	0.01(0.01)	0.00(0.00)	0.01(0.01)	0.00(0.00)	0.13	0.01	0.00	0.00	0.00	0.00
South Coast[1]	45	15	0.97(0.33)	0.04(0.01)	0.01(0.00)	0.23(0.24)	-	-	0.52	0.02	0.01	0.00	-	-
South Coast[2]	0	-	*0.01(0.01)*	*0.05(0.02)*	*0.01(0.00)*	-	0.03(0.01)	0.03(0.02)	*0.00*	*0.06*	*0.01*	-	0.03	0.02
South Coast[3]	6	-	*0.12(0.11)*	*0.08(0.07)*	*0.00(0.00)*	-	0.03(0.02)	0.01(0.01)	*0.00*	*0.07*	*0.00*	-	0.02	0.00

Table 6. *P*-values for tests of significance (Z statistic) for comparisons of the mean density of juvenile salmonids in pools for coastal Monitoring Areas sampled in 2002 and 2003. Significant differences are bolded. NC= North Coast, MC=Mid Coast, MS=Mid-South Coast, UMP=Umpqua, and SC-NR=South Coast Non-Rogue. For the South Coast in 2003 the sites were divided into [1] coho sites, [2] steelhead non-Rogue Basin sites, and [3] steelhead Rogue Basin sites.

	1st-3rd order streams					4th-5th order streams				
Monitoring Area	**NC**	**MC**	**MS**	**UMP**	**SC-NR**	**NC**	**MC**	**MS**	**UMP**	**SC-NR**
Coho 2002										
Mid Coast	0.2574					0.3809				
Mid-South Coast	**0.0059**	**0.0003**				0.4846	0.9043			
Umpqua	0.8443	0.1913	**0.0099**			0.7850	0.5360	0.8861		
South Coast[1]	**0.0000**	**0.0000**	0.1380	**0.0000**		-	-	-	-	
Coho 2003										
Mid Coast	0.2603					0.3198				
Mid-South Coast	**0.0063**	**0.0004**				0.3826	0.3815			
Umpqua	0.9291	0.0590	**0.0047**			0.3197	0.5383	0.3234		
South Coast[1]	**0.0041**	**0.0001**	0.5760	**0.0026**		0.7430	0.3216	0.4651	0.3200	
Steelhead 2002										
Mid Coast	0.6577					0.9239				
Mid-South Coast	0.6989	0.9036				0.6672	0.5893			
Umpqua	**0.0456**	0.0631	0.3029			0.8217	0.9423	0.4347		
Steelhead 2003										
Mid Coast	**0.0406**					0.5132				
Mid-South Coast	0.1815	0.6156				0.3521	0.4007			
Umpqua	**0.0000**	**0.0002**	**0.0000**			0.6037	0.9809	0.7352		
South Coast[2]	0.2907	**0.0001**	**0.0088**	**0.0000**		0.6285	0.9790	0.7036	0.8009	
South Coast[3]	0.1142	**0.0036**	**0.0134**	**0.0000**	0.3222	0.9615	0.5924	0.4635	0.3232	0.3479
Cutthroat 2002										
Mid Coast	**0.0242**					0.6993				
Mid-South Coast	0.7492	0.1083				0.5304	0.7559			
Umpqua	**0.0002**	**0.0432**	**0.0051**			0.3462	0.4774	0.6330		
Cutthroat 2003										
Mid Coast	**0.0183**					0.3966				
Mid-South Coast	0.1023	0.2814				0.6825	0.5615			
Umpqua	**0.0024**	0.1868	**0.0238**			0.3649	0.6117	0.3860		
South Coast[2]	**0.0018**	0.1318	**0.0138**	0.9659		0.8009	0.4975	0.9826	0.4443	
South Coast[3]	**0.0001**	**0.0010**	**0.0001**	**0.0199**	**0.0000**	0.4627	0.8975	0.5330	0.7447	0.3829

Table 7. Differences between brood cycles within the same coastal Monitoring Area in the mean density of juvenile coho. Data are for sites in 1st - 3rd order streams.

Comparison	Difference in Means	*P* for difference
Brood Cycle 1999 vs. 2002		
North Coast	0.32	<0.05
Mid-Coast	0.21	<0.05
Mid-South Coast	0.45	<0.05
Umpqua	0.26	<0.05
South Coast	0.92	<0.05
Brood Cycle 2000 vs. 2003		
North Coast	0.20	<0.05
Mid-Coast	0.13	<0.05
Mid-South Coast	0.64	<0.05
Umpqua	0.22	<0.05
South Coast	0.79	<0.05

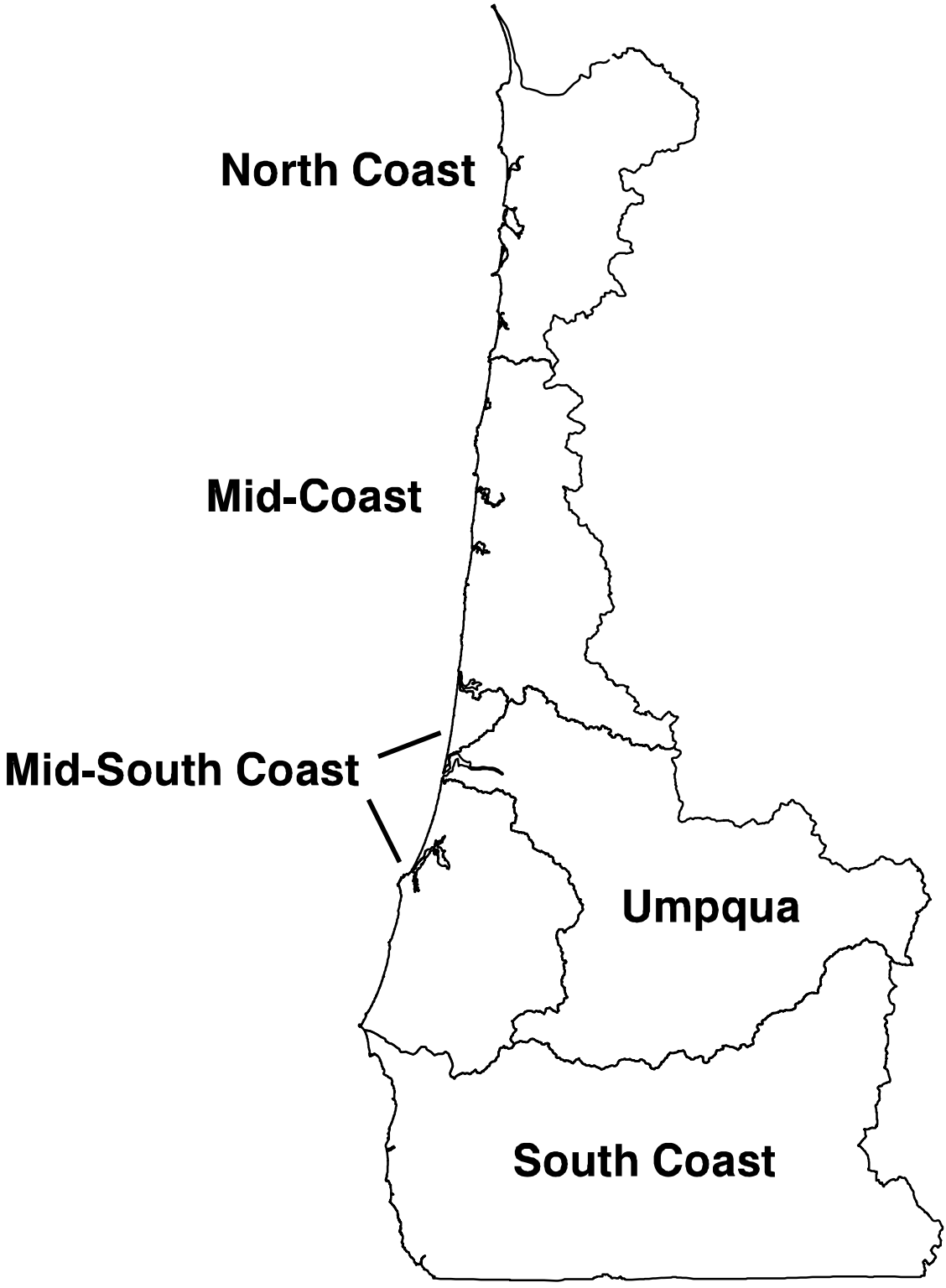

Figure 1. Location of five Monitoring Areas for coho salmon and steelhead along the Oregon Coast.

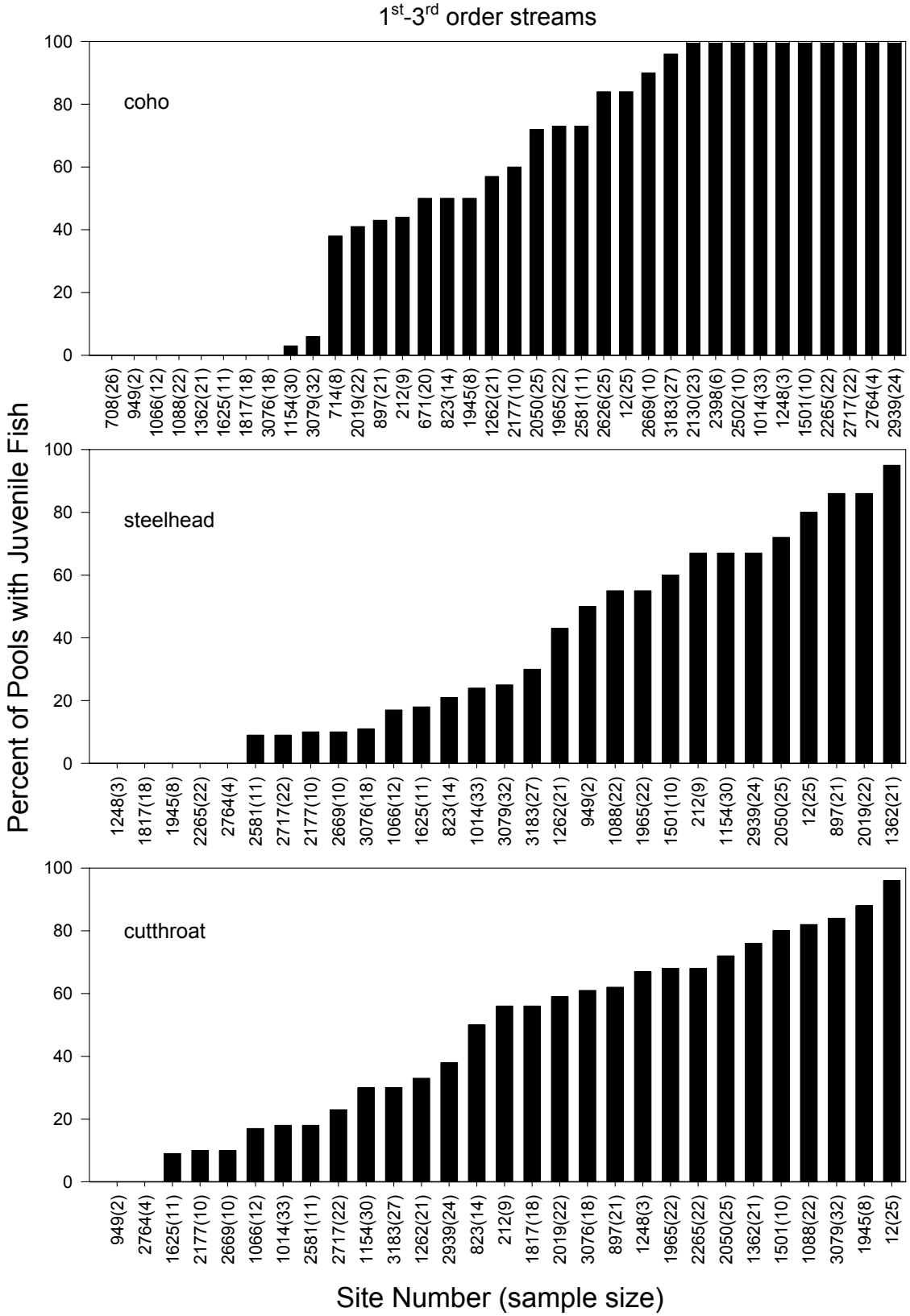

Figure 2. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2002 in the North Coast (see Appendix 1.1 for site data).

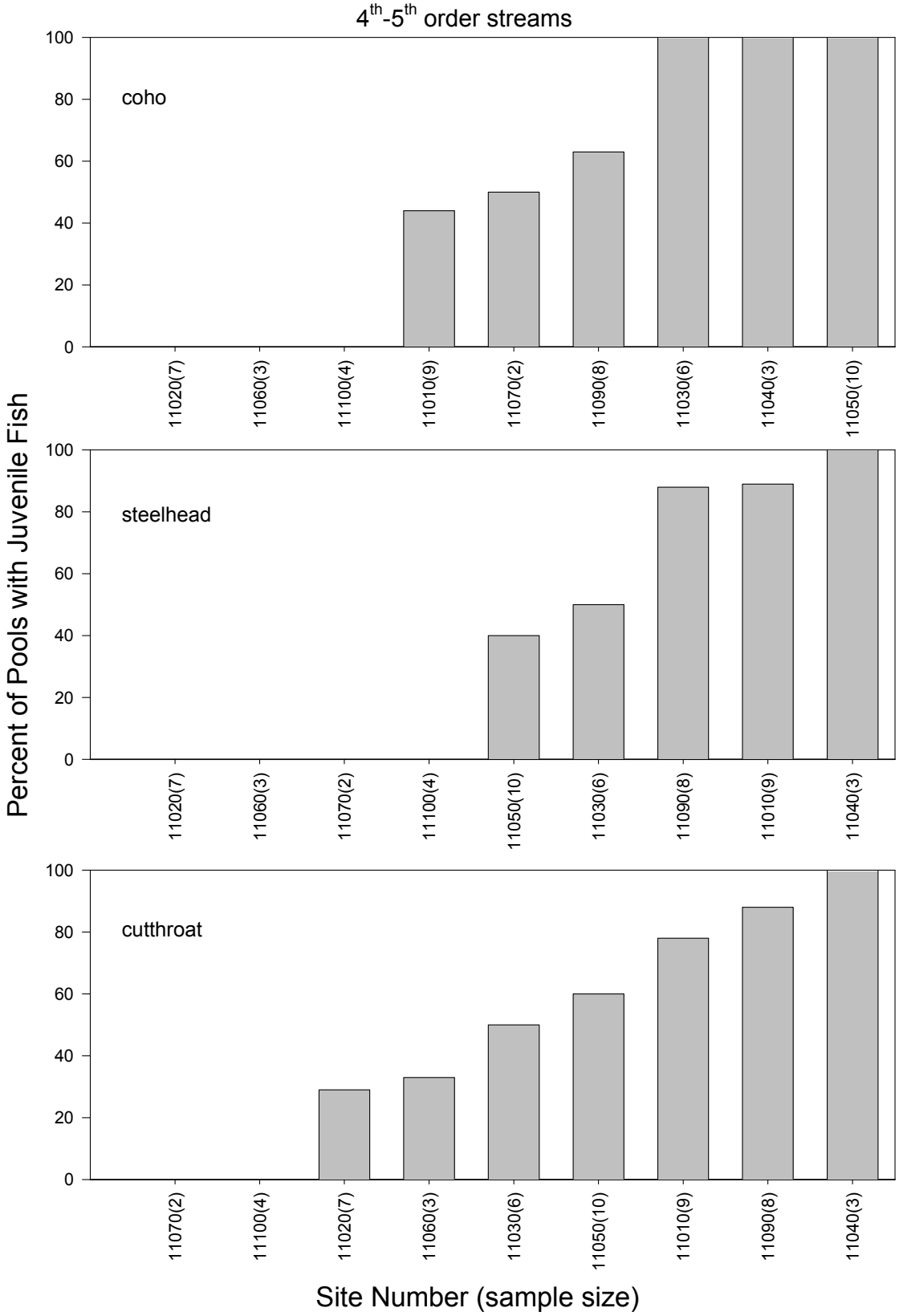

Figure 3. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams) snorkeled or electrofished in the summer of 2002 in the North Coast (see Appendix 1 .1 for site data).

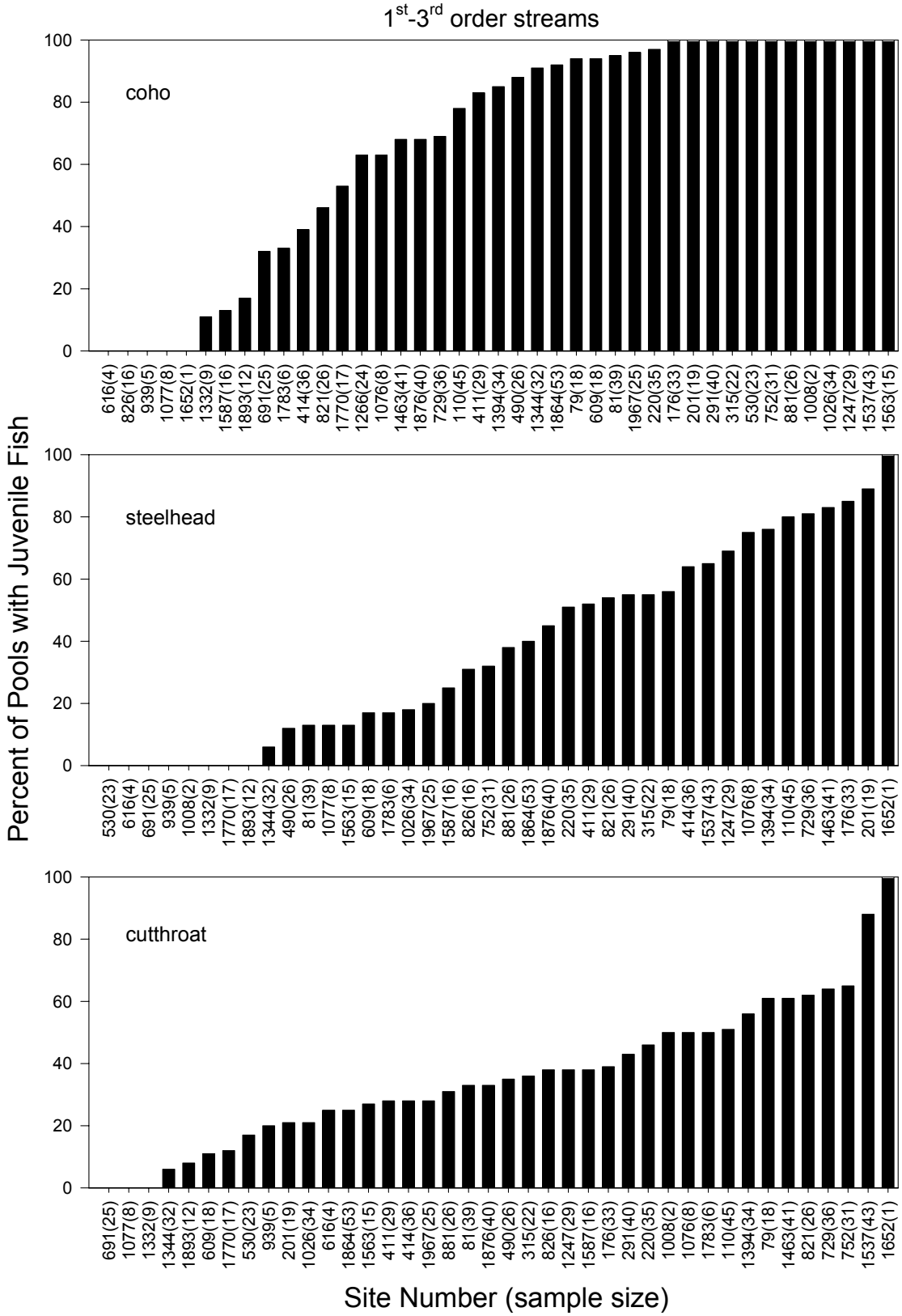

Figure 4. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2002 in the Mid-Coast (see Appendix 1.1 for site data).

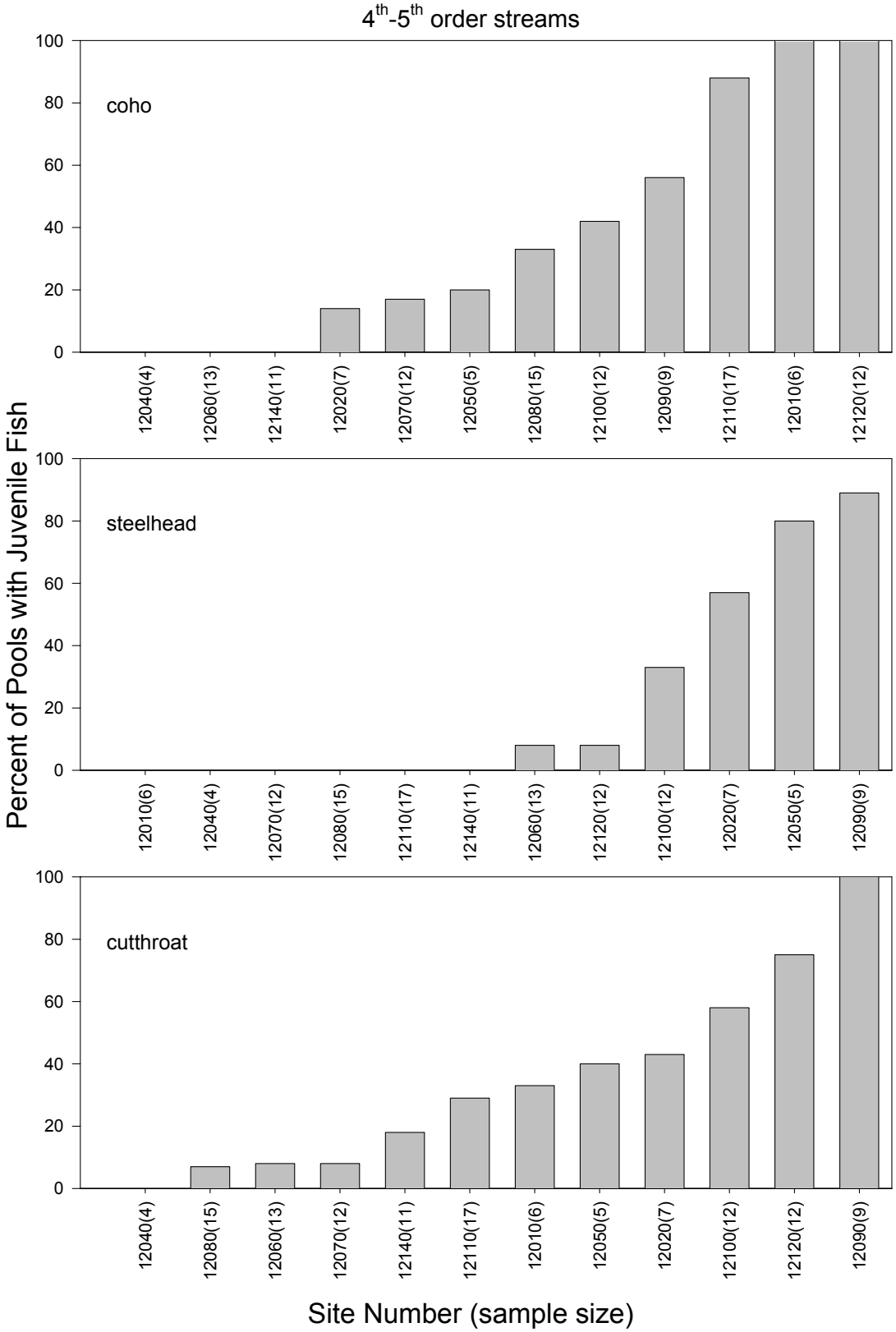

Figure 5. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams) snorkeled or electrofished in the summer of 2002 in the Mid-Coast (see Appendix 1.1 for site data).

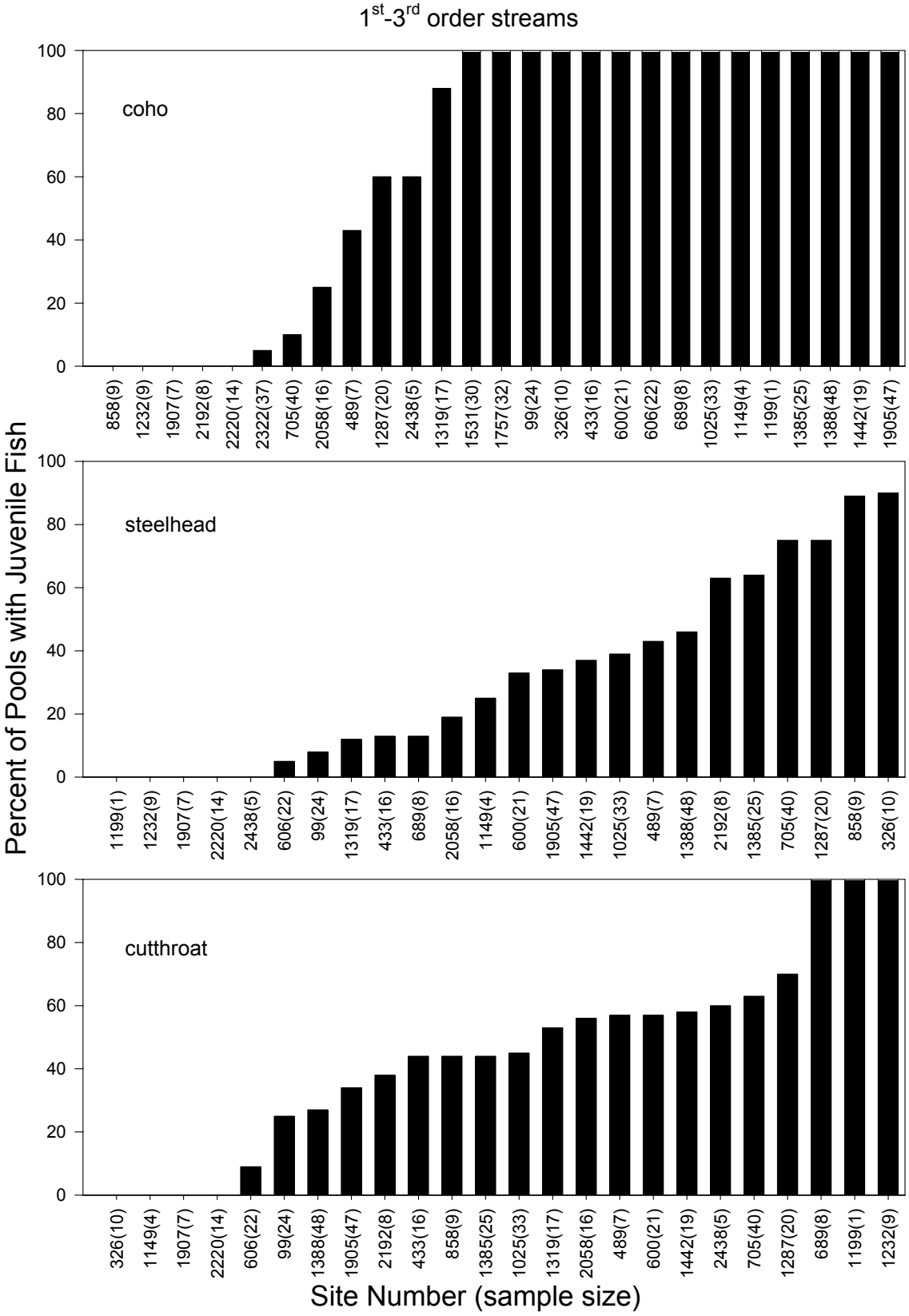

Figure 6. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2002 in the Mid-South Coast (see Appendix 1.1 for site data).

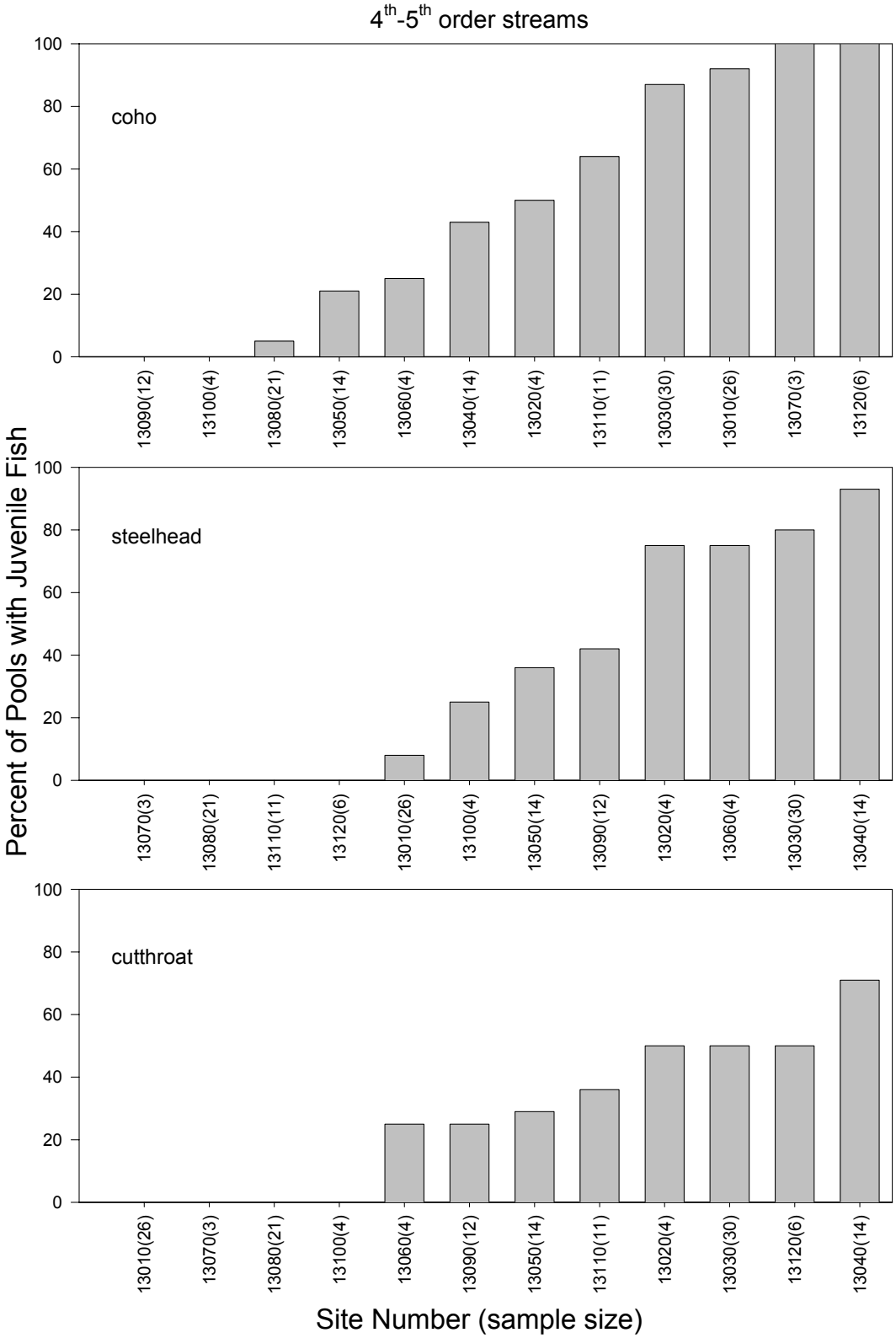

Figure 7. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams) snorkeled or electrofished in the summer of 2002 in the Mid-South Coast (see Appendix 1.1 for site data).

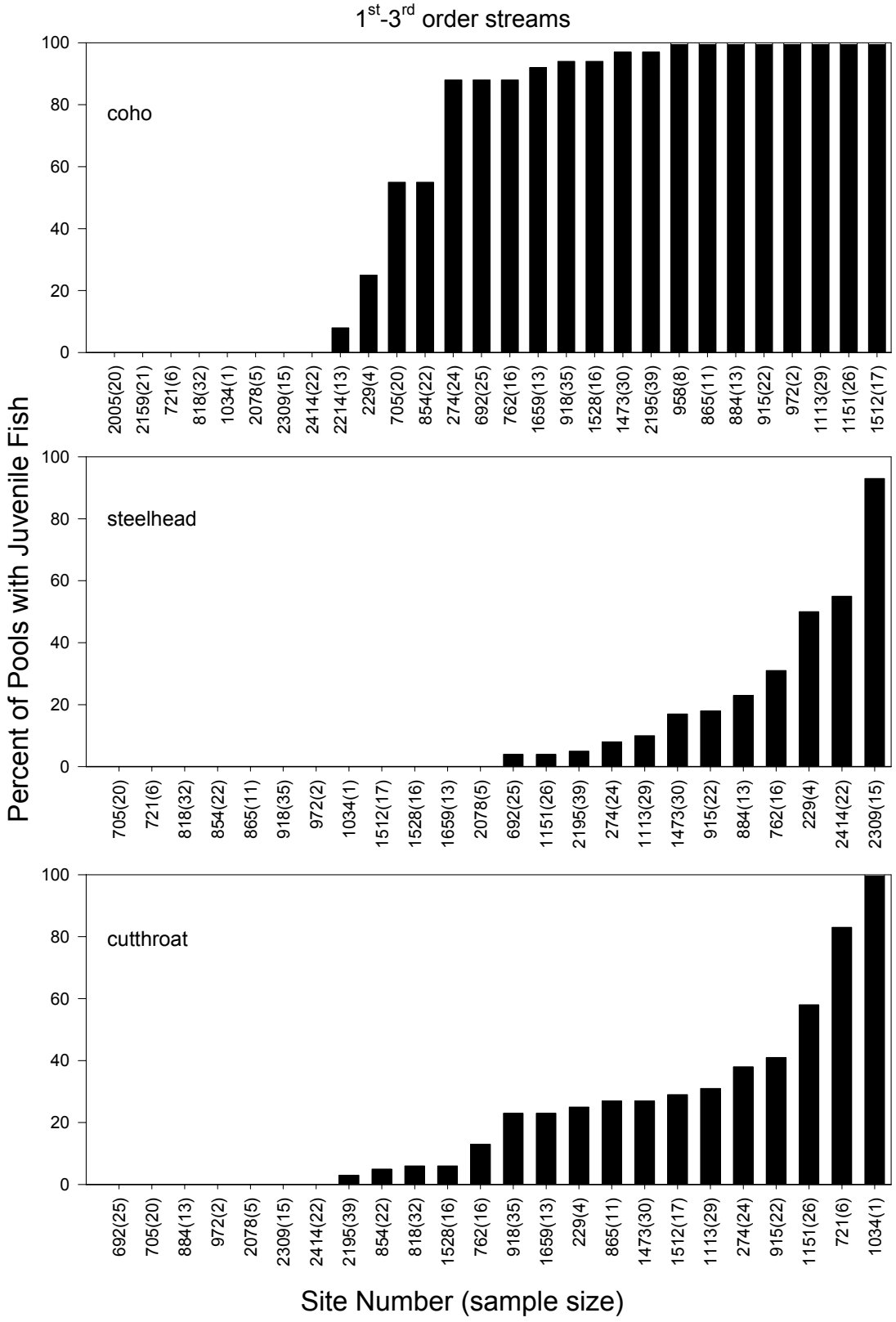

Figure 8. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2002 in the Umpqua (see Appendix 1.1 for site data).

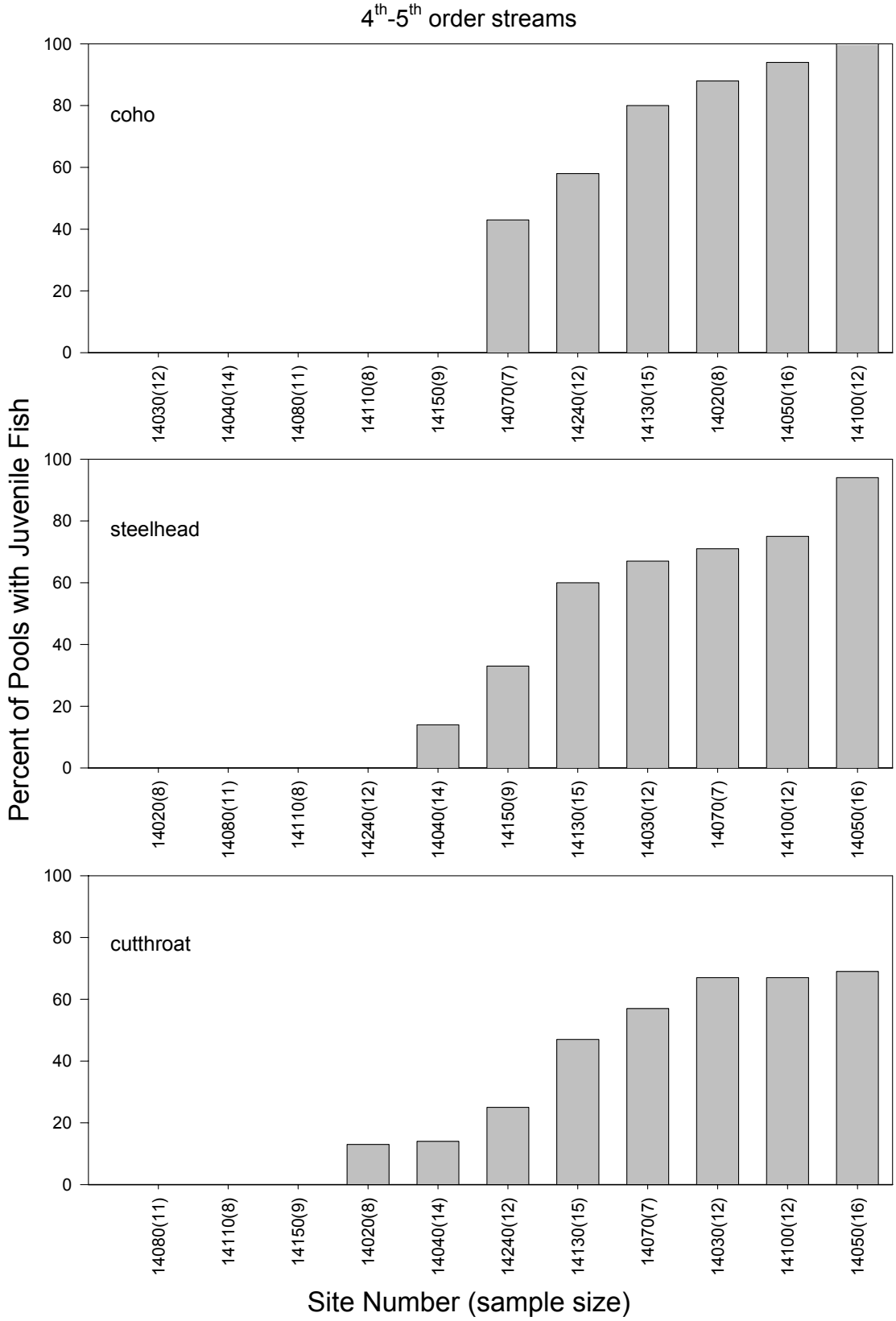

Figure 9. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams) snorkeled or electrofished in the summer of 2002 in the Umpqua (see Appendix 1.1 for site data).

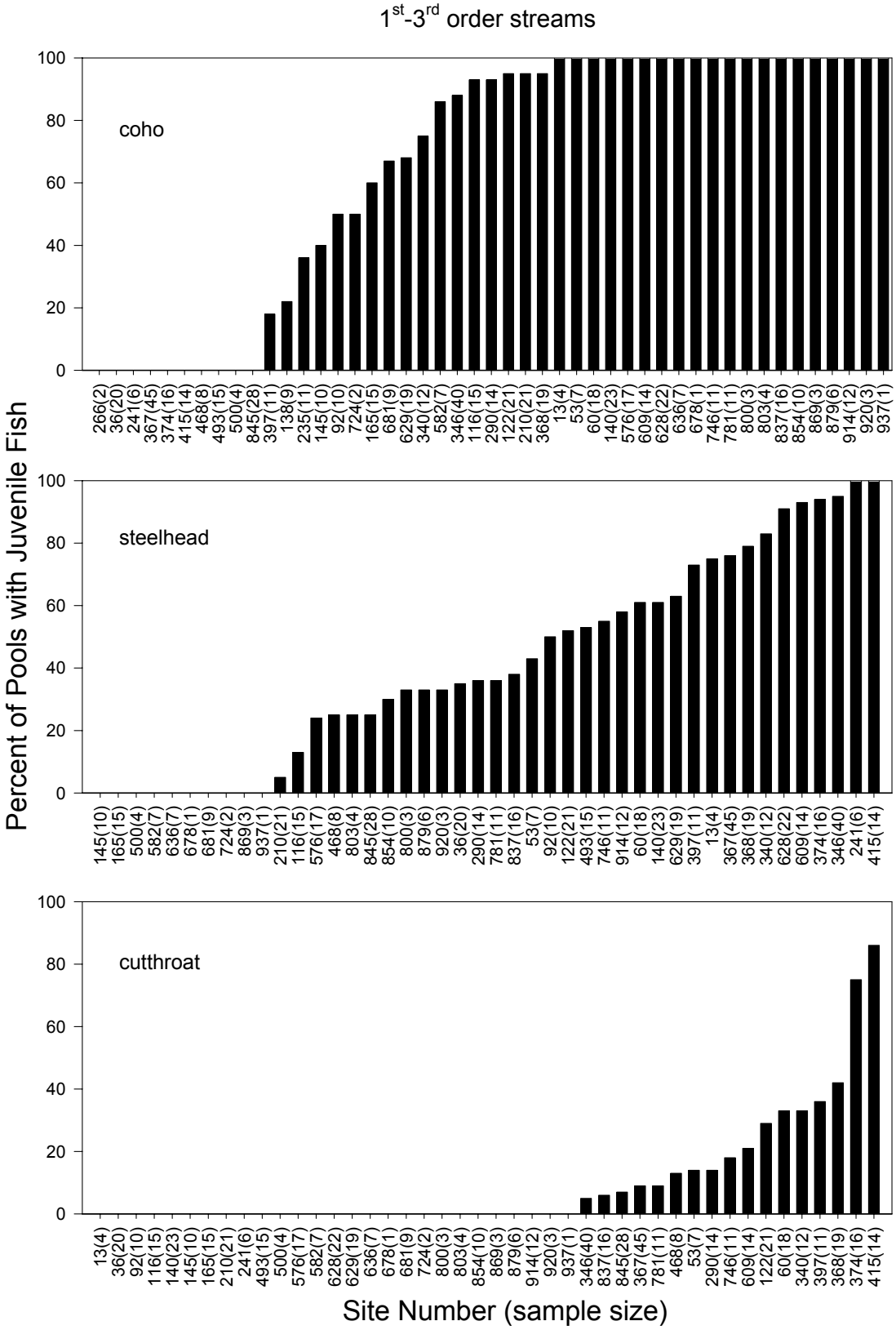

Figure 10. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2002 in the South Coast (see Appendix 1.1 for site data).

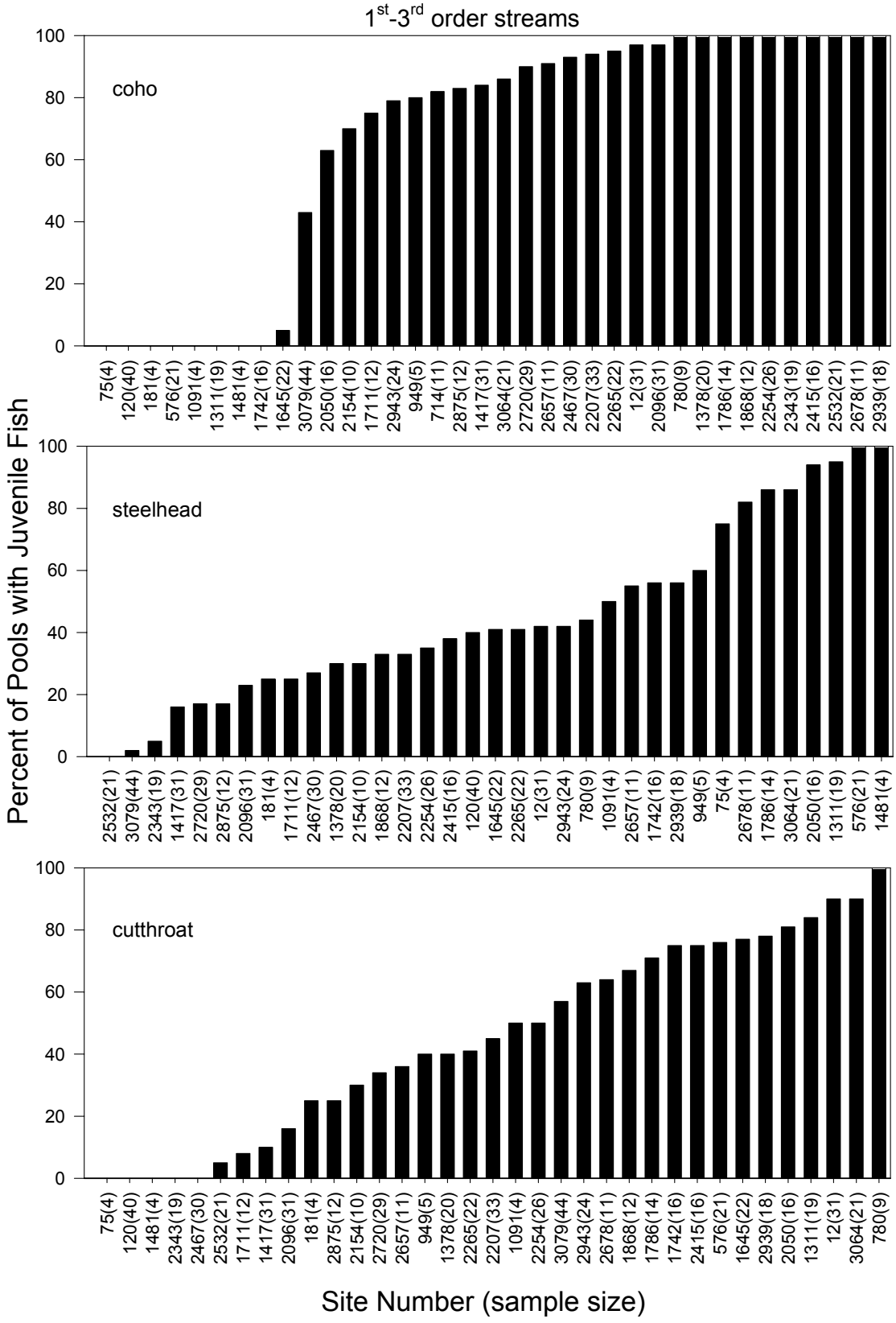

Figure 11. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2003 in the North Coast (see Appendix 1.2 for site data).

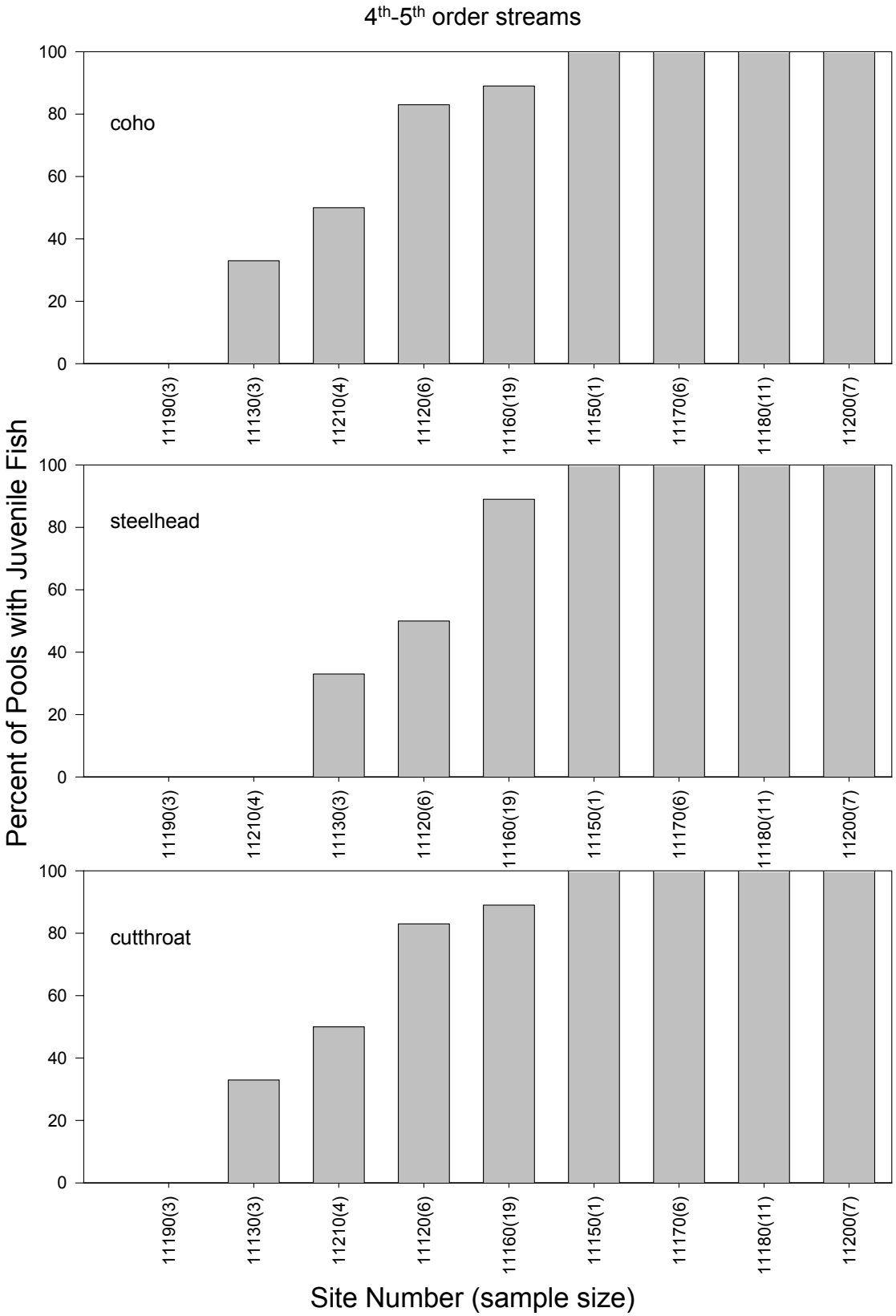

Figure 12. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams) snorkeled or electrofished in the summer of 2003 in the North Coast (see Appendix 1.2 for site data).

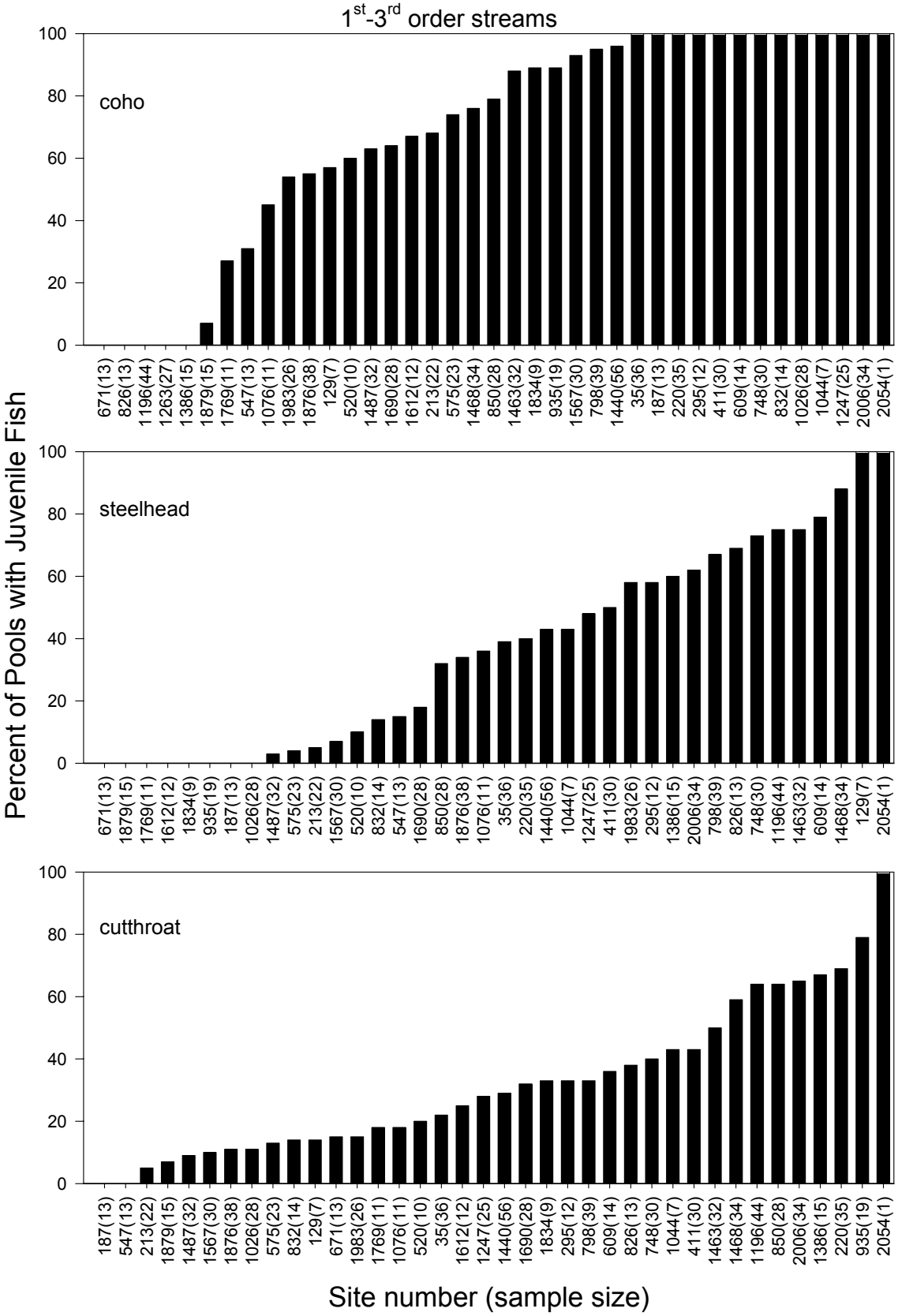

Figure 13. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2003 in the Mid Coast (see Appendix 1.2 for site data).

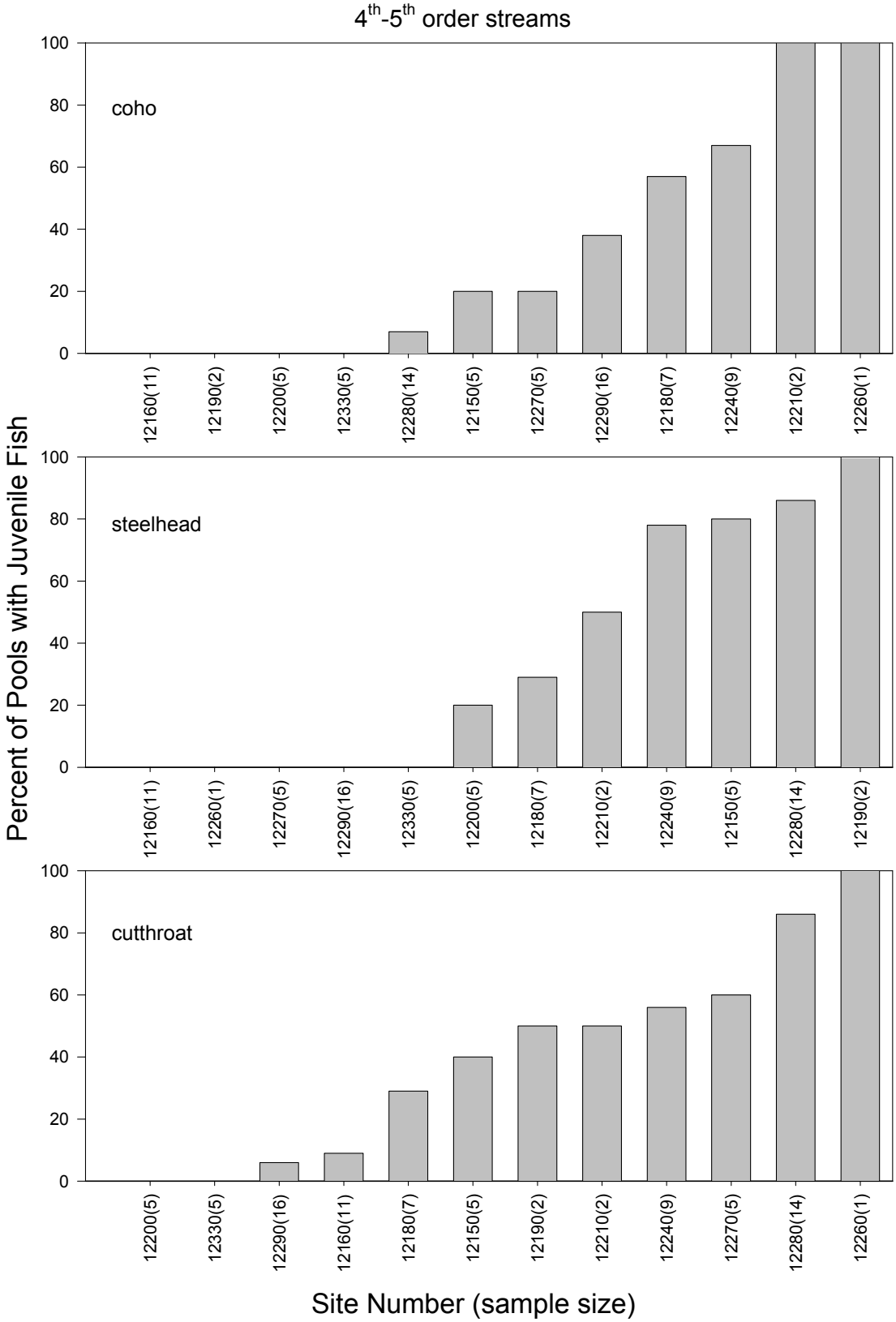

Figure 14. Percentage of pools that contained juvenile salmonids at each site (4th-5th order streams) snorkeled or electrofished in the summer of 2003 in the Mid Coast (see Appendix 1.2 for site data).

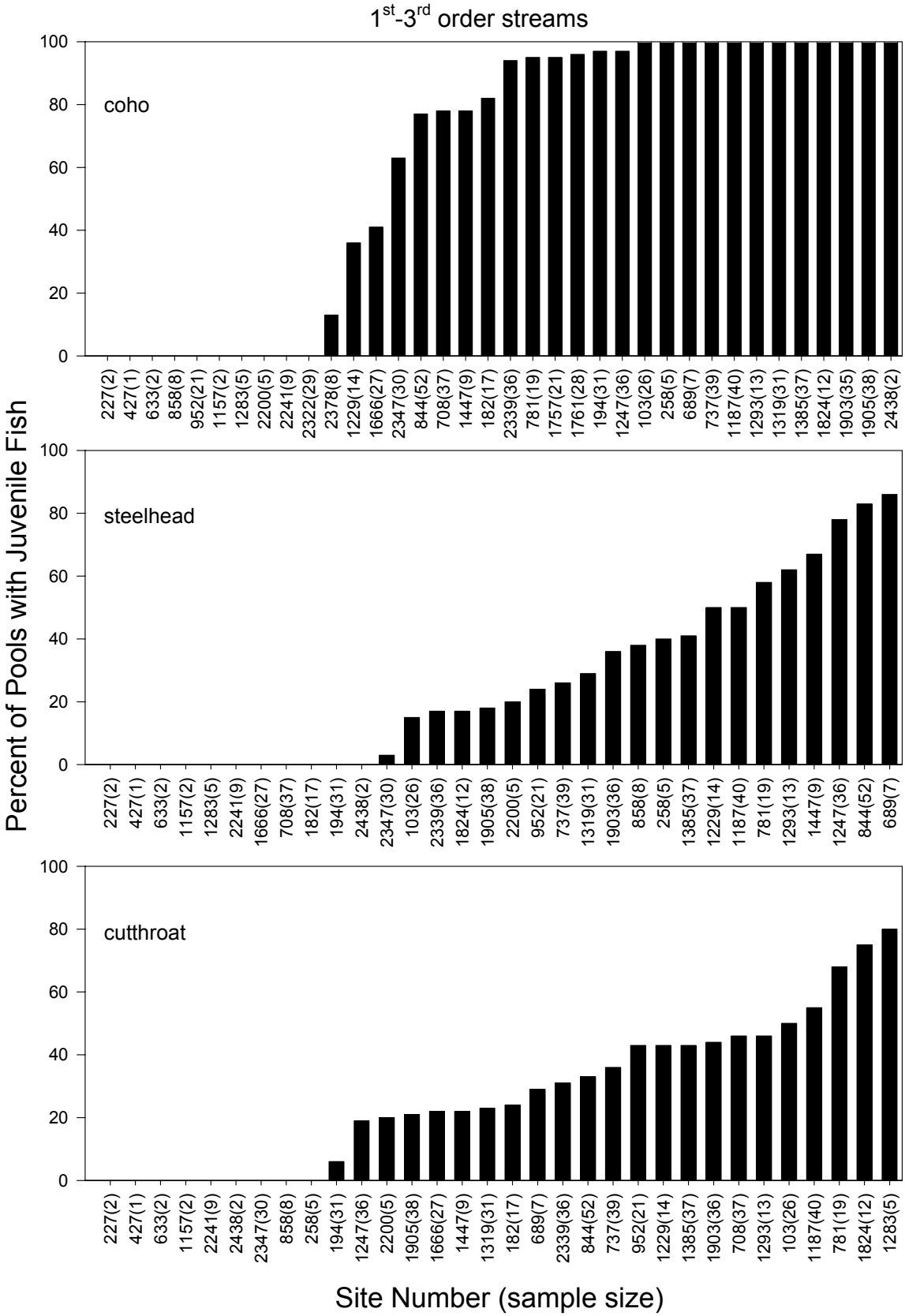

Figure 15. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2003 in the Mid-South Coast (see Appendix 1.2 for site data).

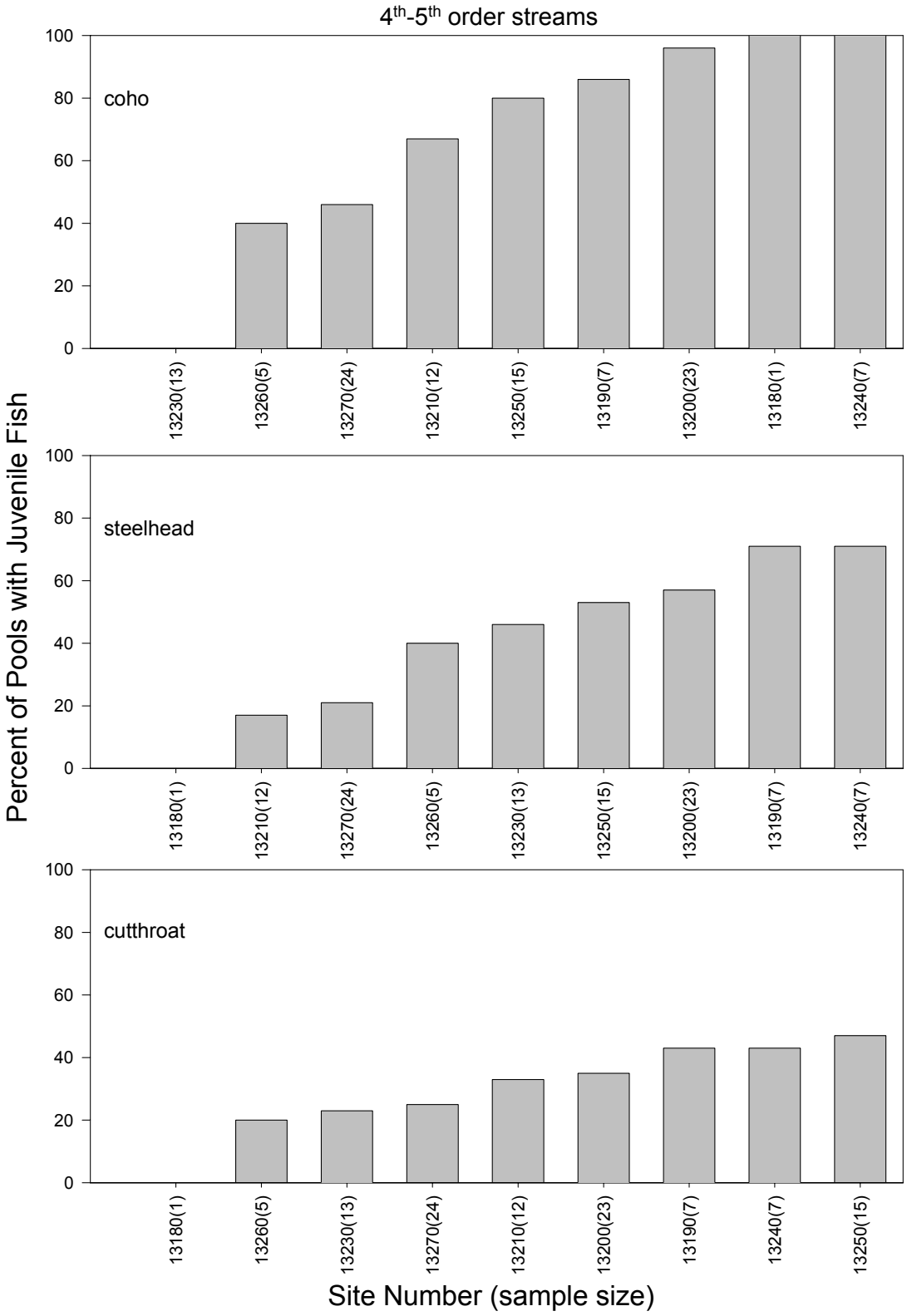

Figure 16. Percentage of pools that contained juvenile salmonids at each site (4th-5th order streams) snorkeled or electrofished in the summer of 2003 in the Mid-South Coast (see Appendix 1.2 for site data).

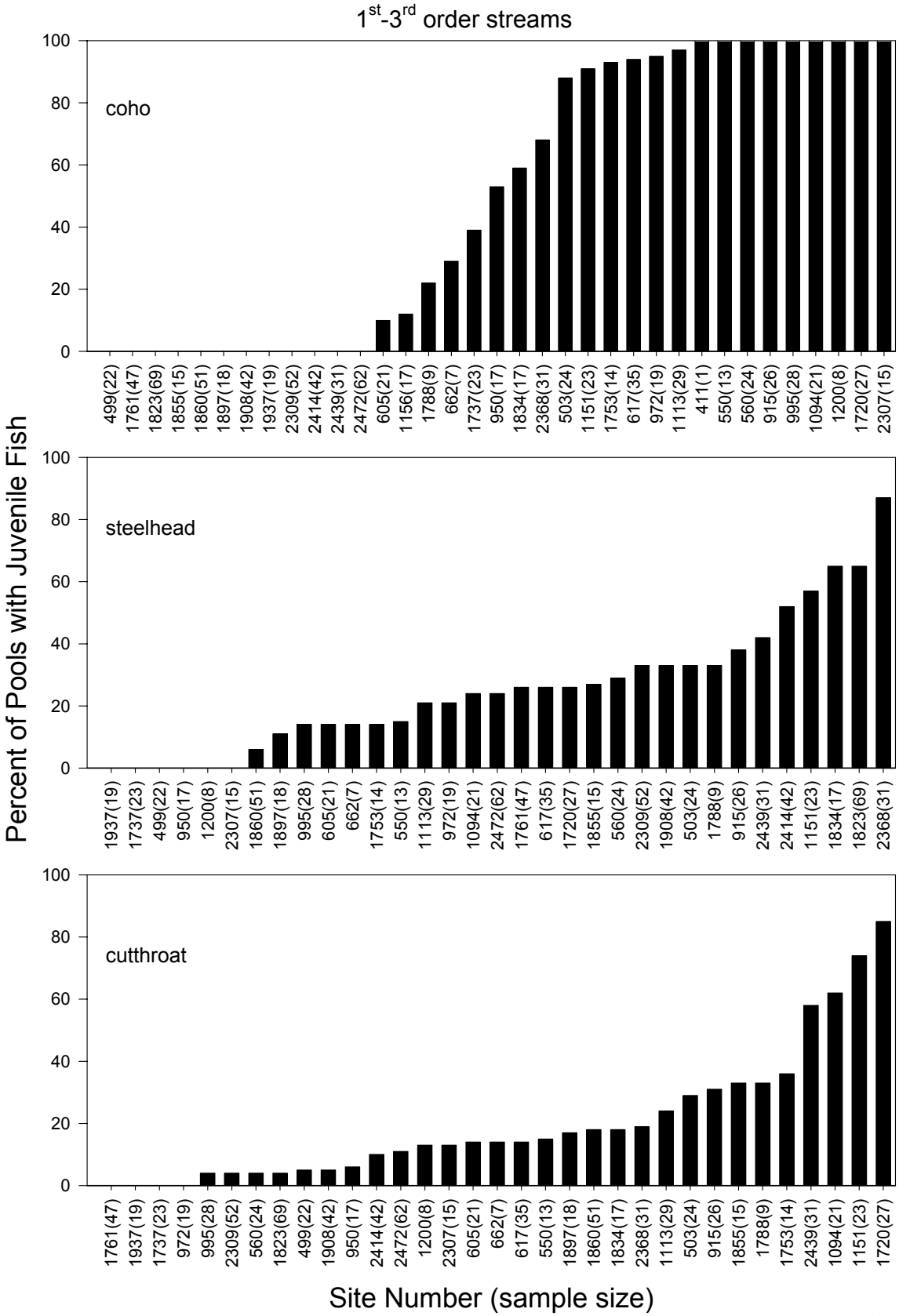

Figure 17. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2003 in the Umpqua (see Appendix 1.2 for site data).

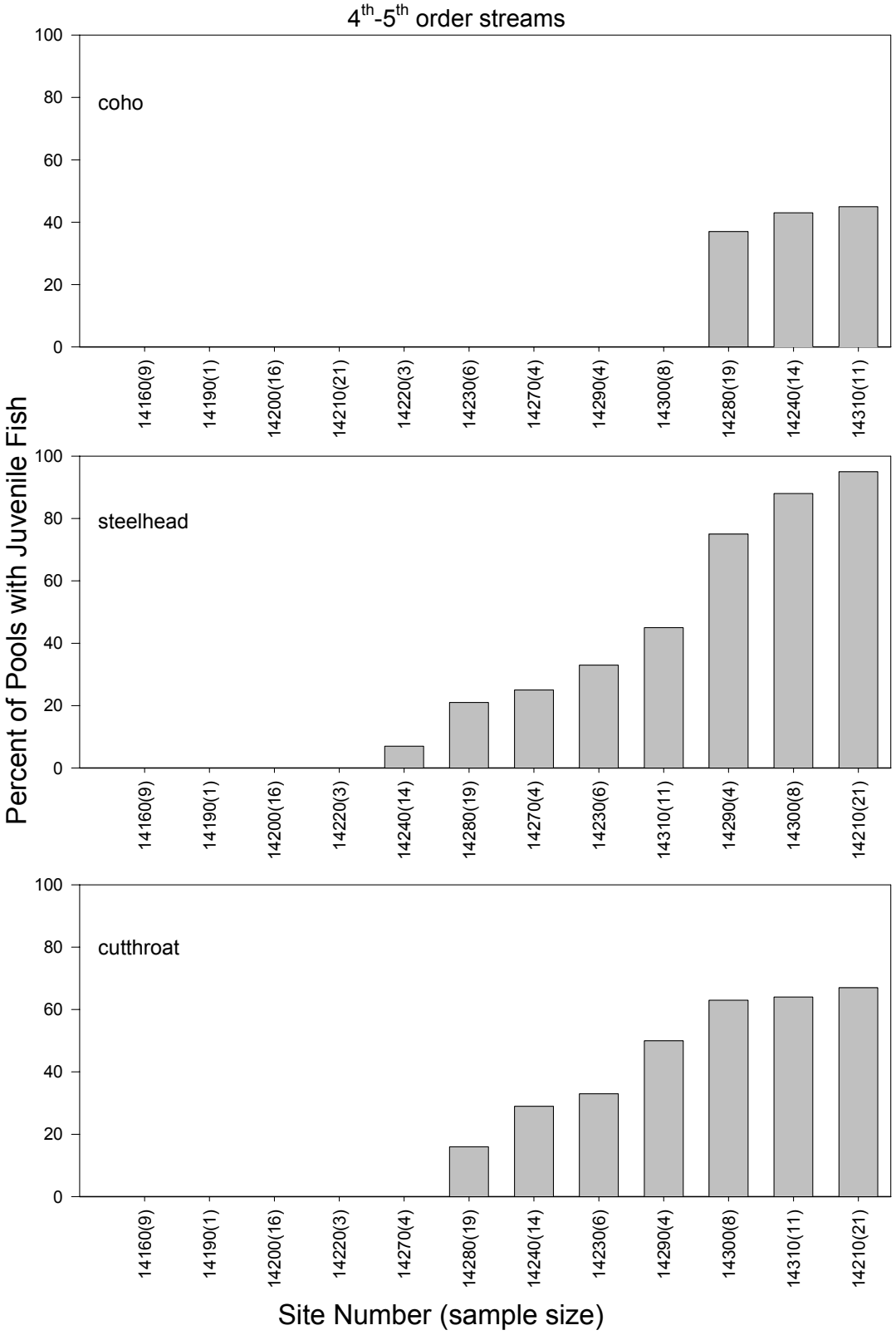

Figure 18. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams) snorkeled or electrofished in the summer of 2003 in the Umpqua (see Appendix 1.2 for site data).

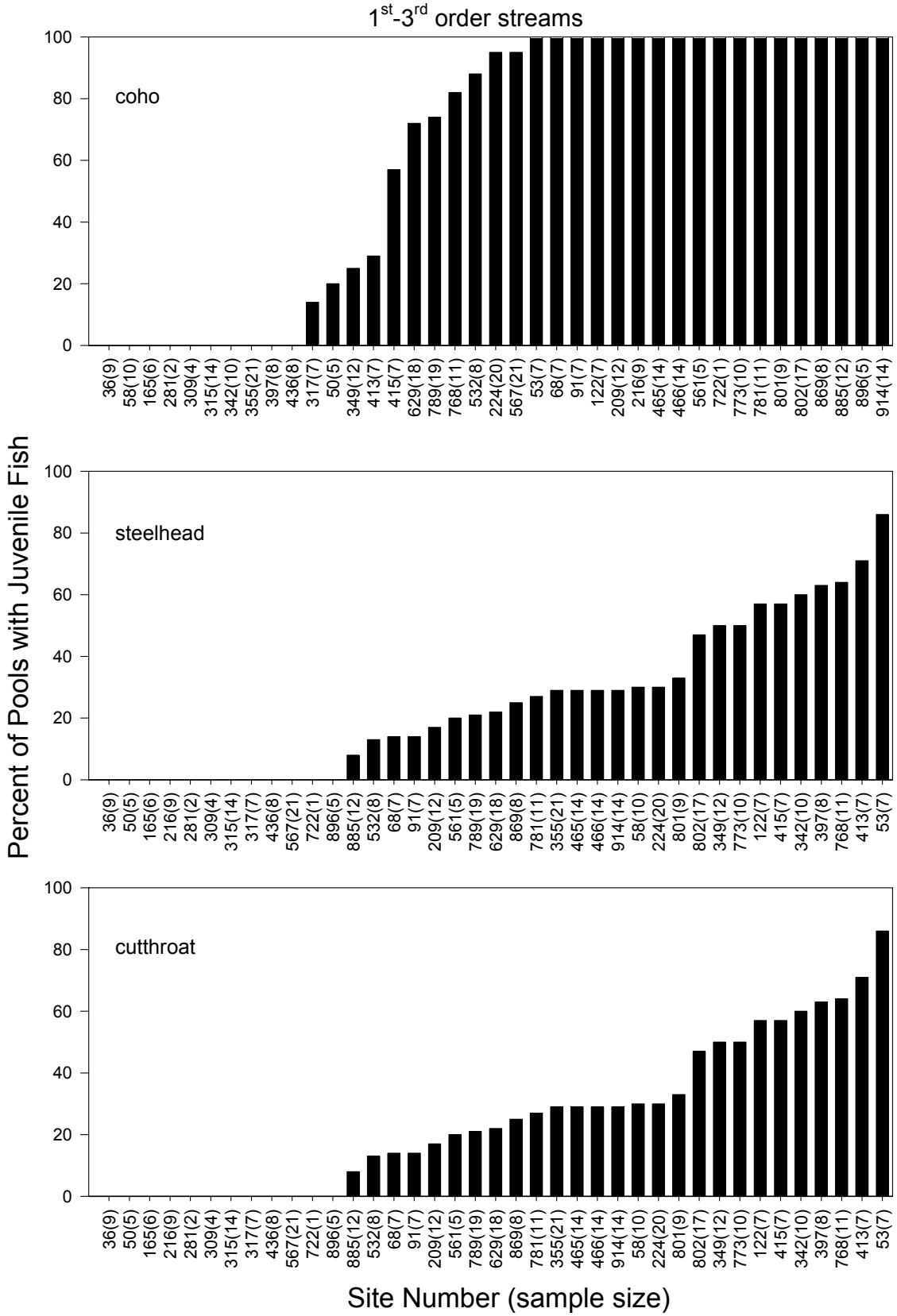

Figure 19. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams) snorkeled or electrofished in the summer of 2003 in the South Coast (see Appendix 1.2 for site data).

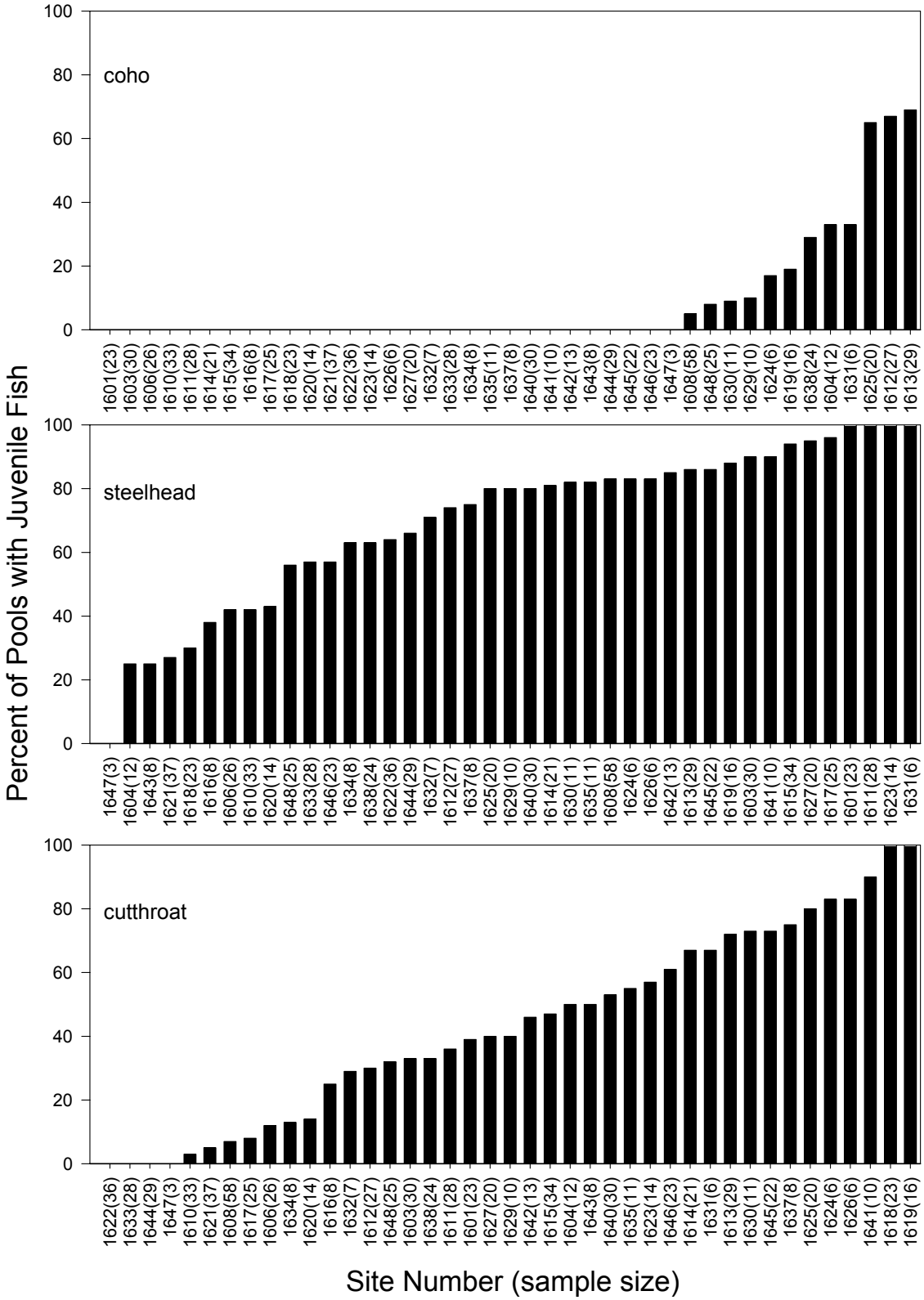

Figure 20. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams from Non-Rogue Basin steelhead coverage) snorkeled or electrofished in the summer of 2003 in the South Coast (see Appendix 1.2 for site data).

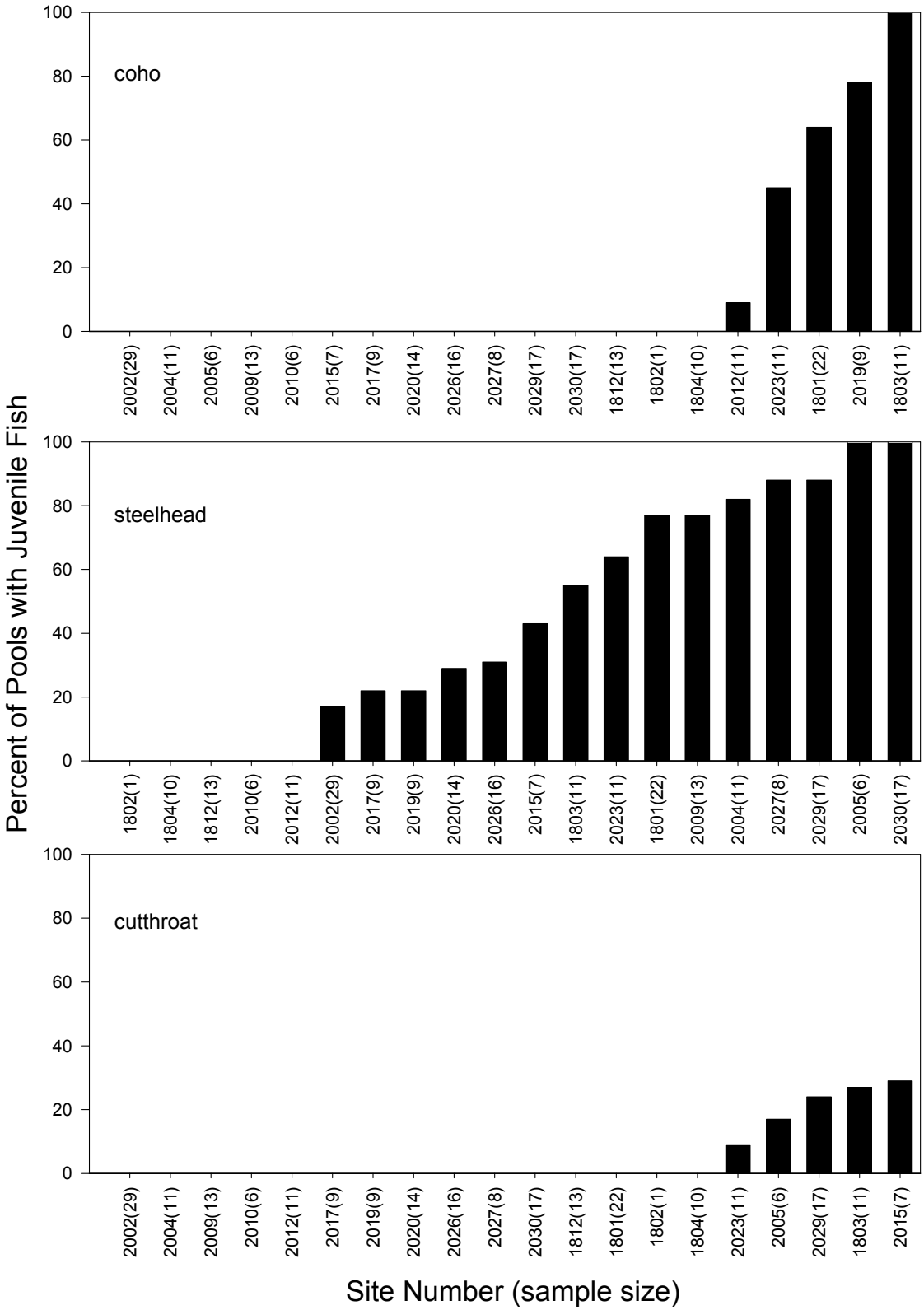

Figure 21. Percentage of pools that contained juvenile salmonids at each site (1st-3rd order streams from Rogue Basin steelhead coverage) snorkeled or electrofished in the summer of 2003 in the South Coast (see Appendix 1.2 for site data).

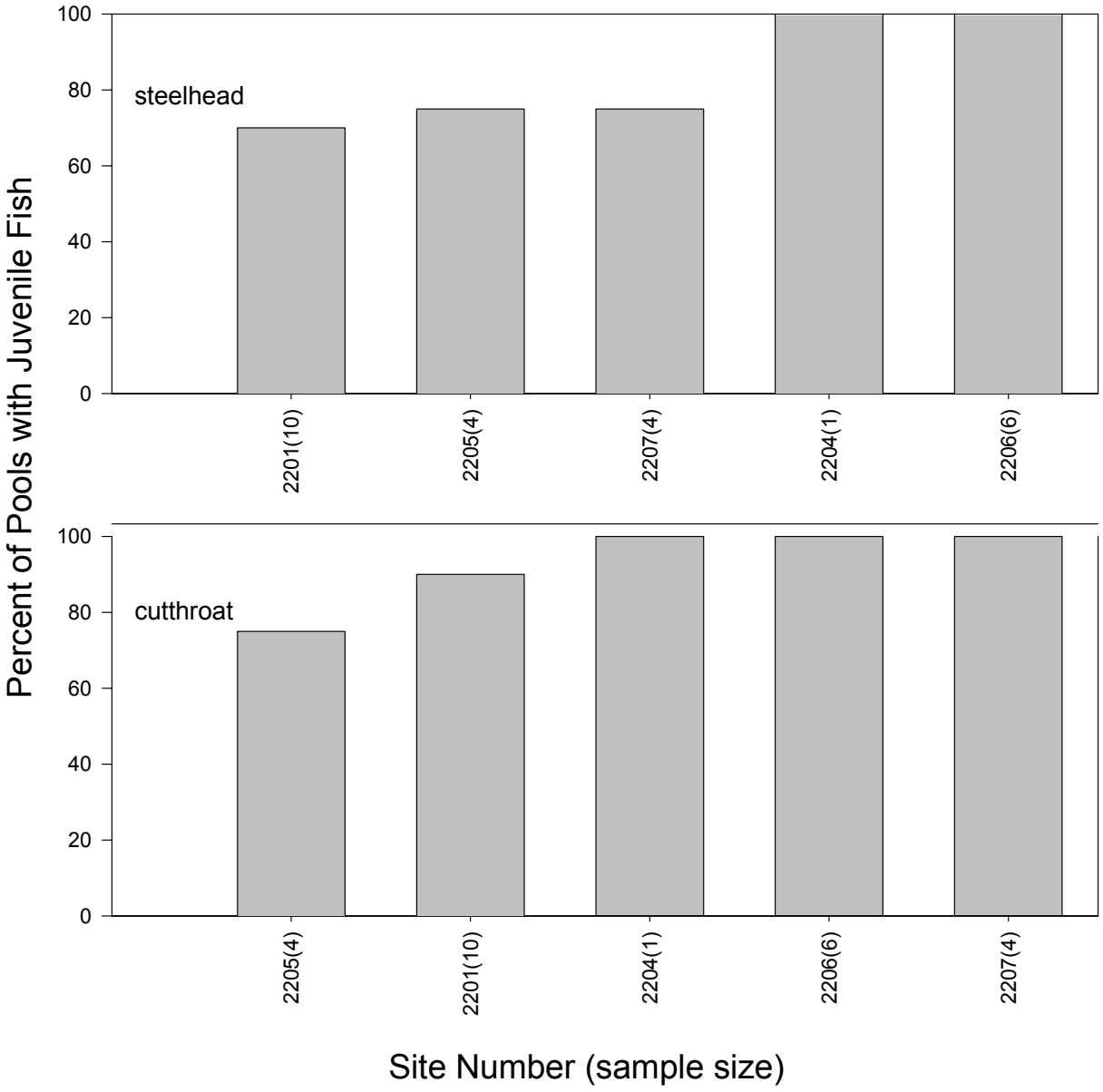

Figure 22. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams from Non-Rogue Basin steelhead coverage) snorkeled or electrofished in the summer of 2003 in the South Coast (see Appendix 1.2 for site data). No coho were observed.

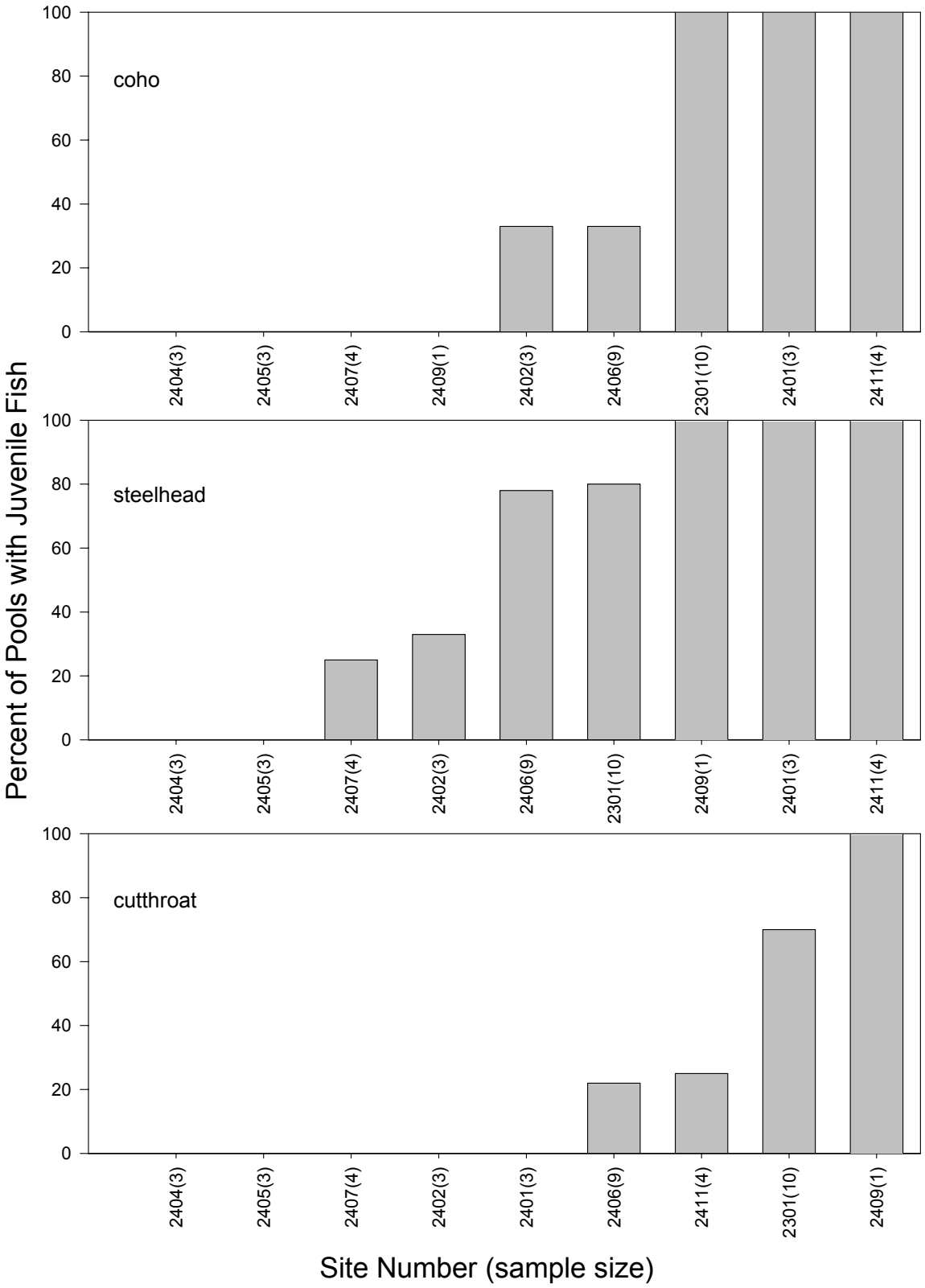

Figure 23. Percentage of pools that contained juvenile salmonids at each site (4^{th}-5^{th} order streams from Rogue Basin steelhead coverage) snorkeled or electrofished in the summer of 2003 in the South Coast (see Appendix 1.2 for site data)

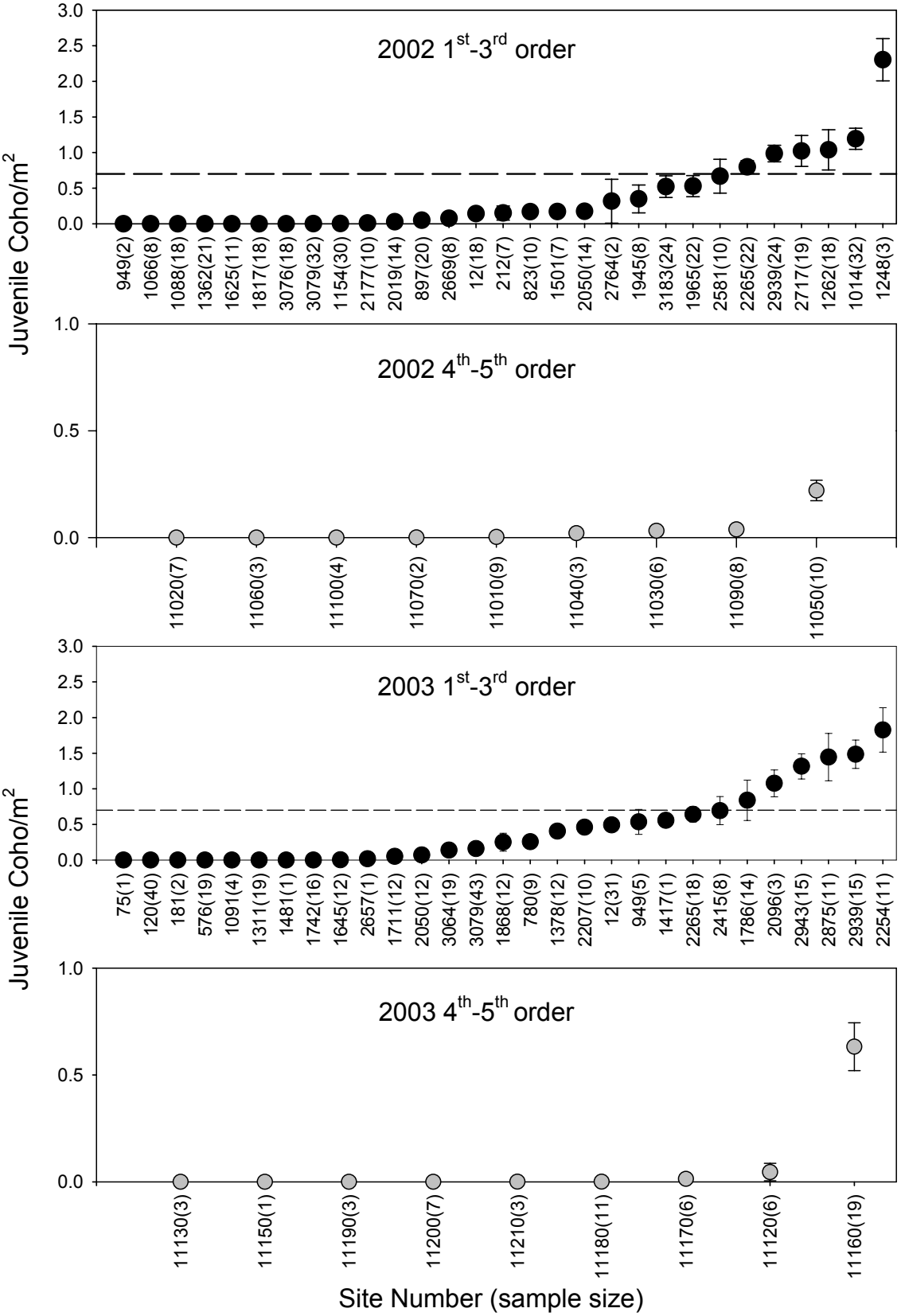

Figure 24. Mean density (and standard error) of juvenile coho at North Coast sites in 2002 and 2003 (see Appendices 1.1-1.2 for site data).

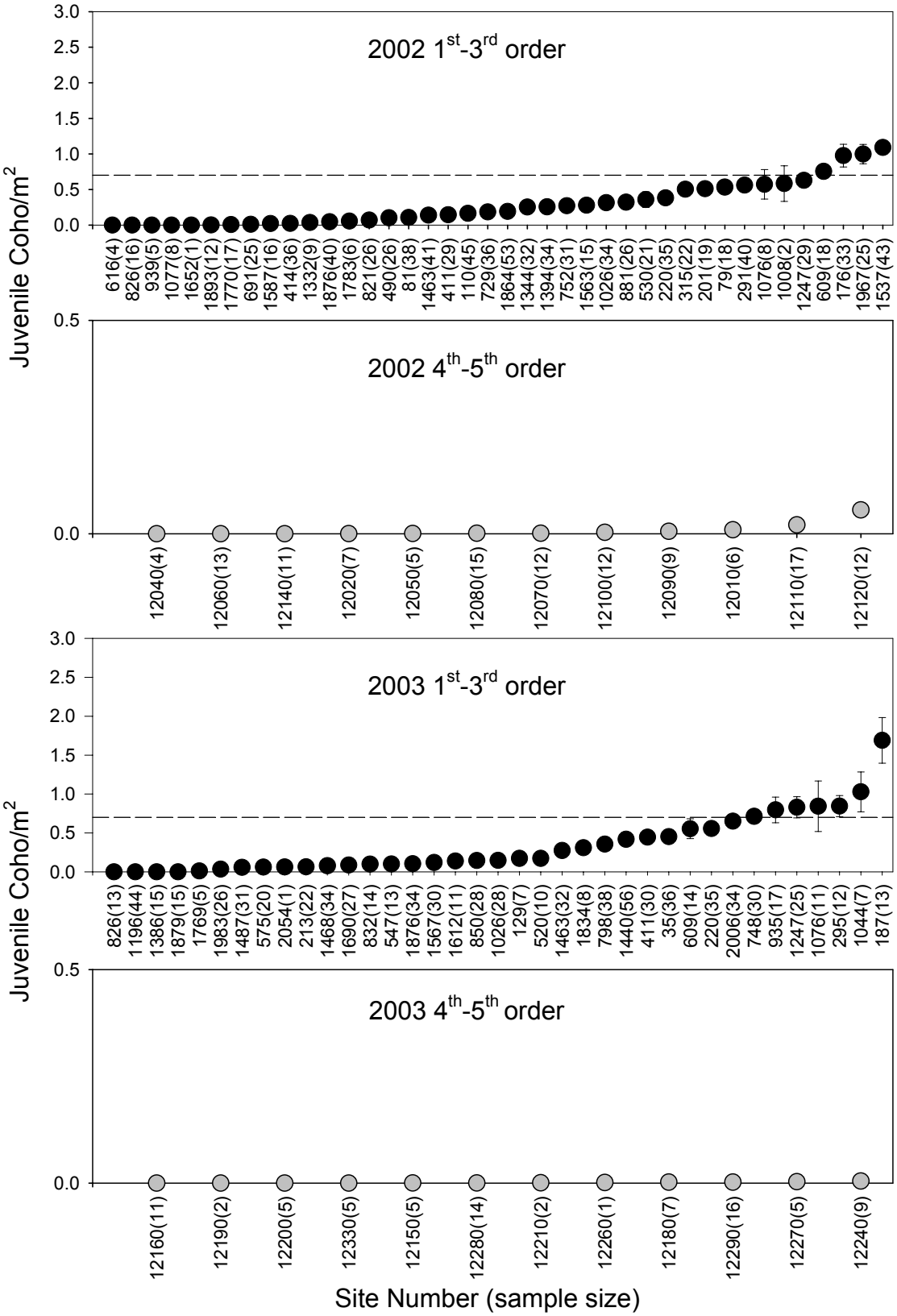

Figure 25. Mean density (and standard error) of juvenile coho at Mid Coast sites in 2002 and 2003 (see Appendices 1.1-1.2 for site data).

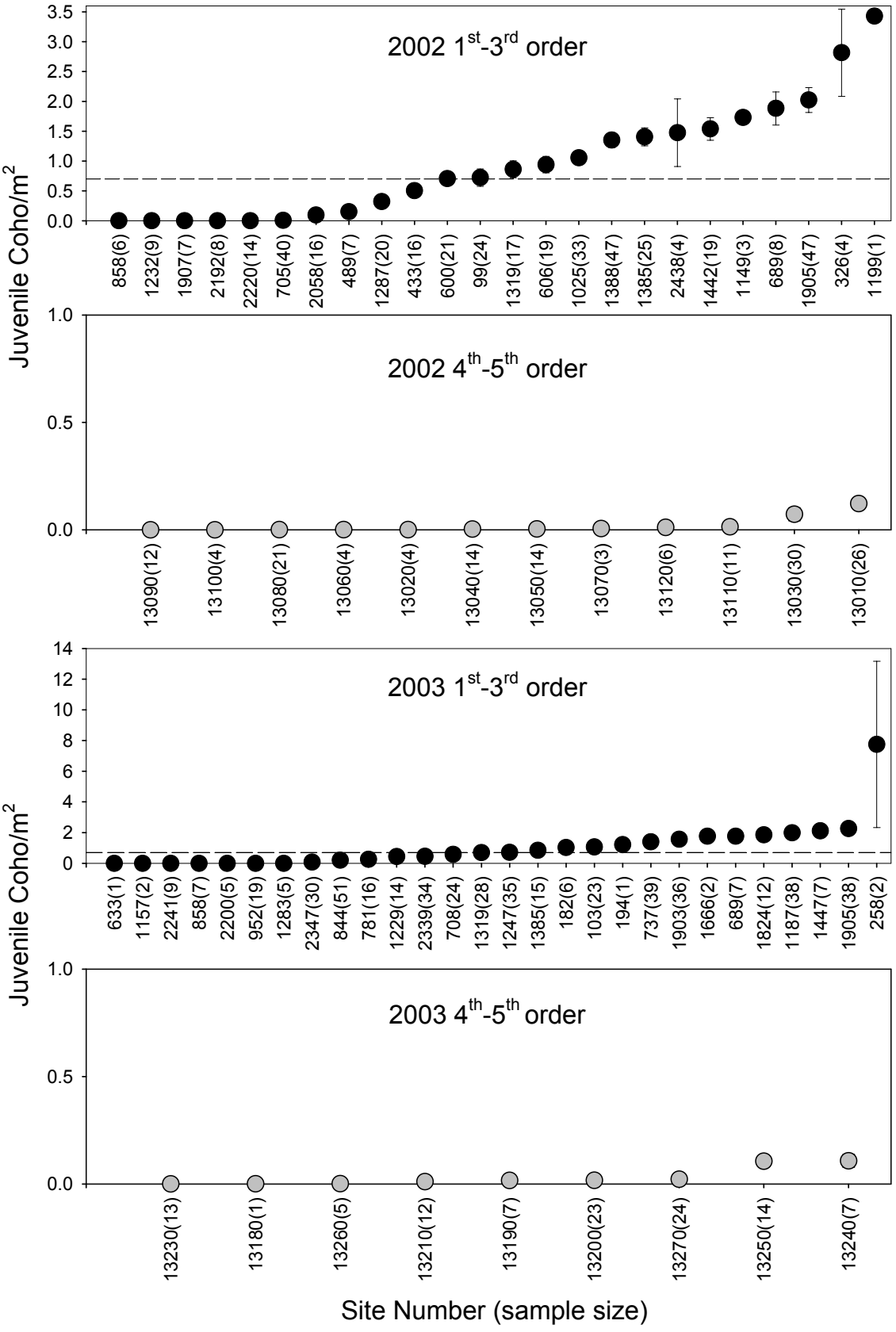

Figure 26. Mean density (and standard error) of juvenile coho at Mid-South Coast sites in 2002 and 2003 (see Appendices 1.1-1.2 for site data).

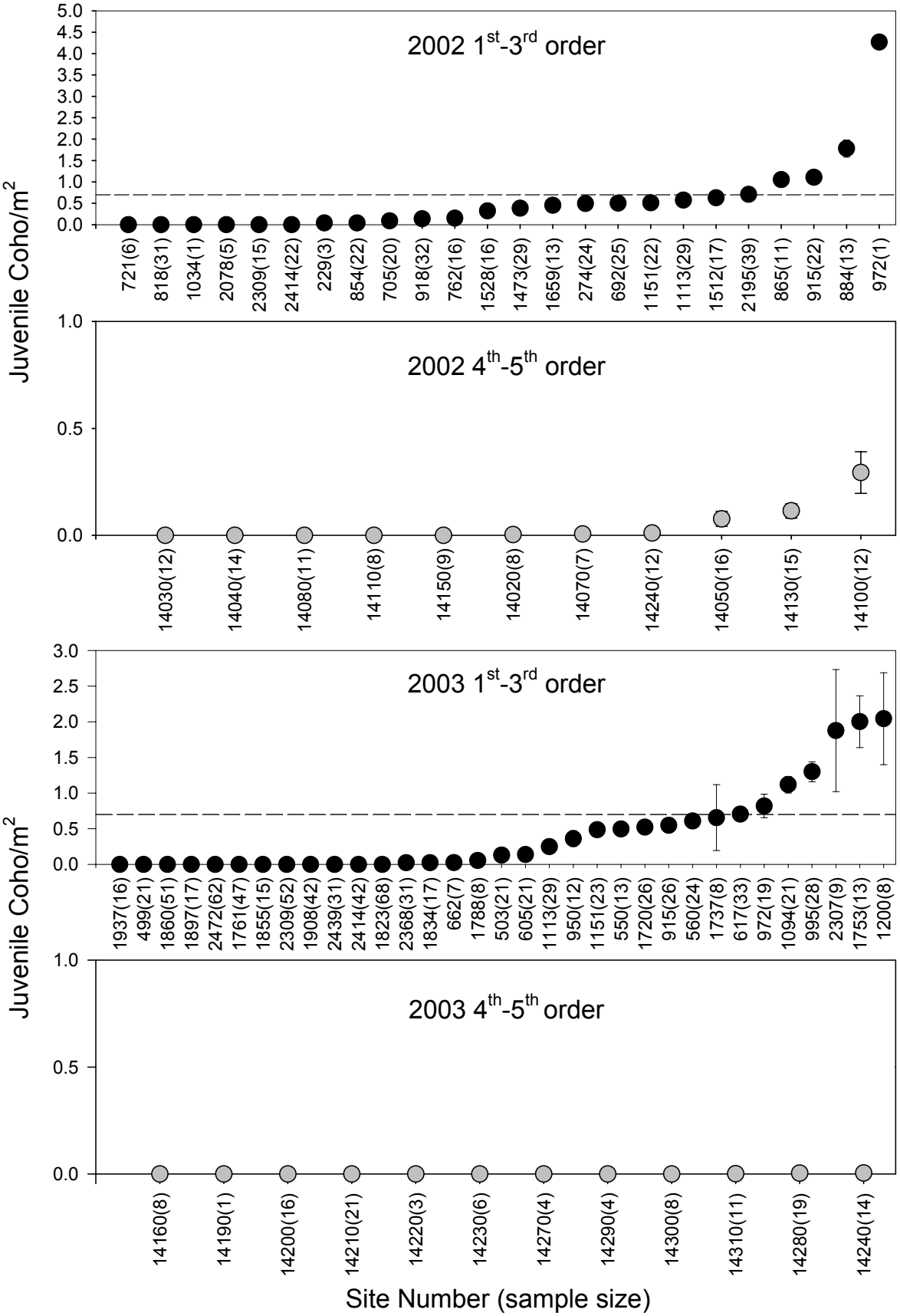

Figure 27. Mean density (and standard error) of juvenile coho at Umpqua sites in 2002 and 2003 (see Appendices 1.1-1.2 for site data).

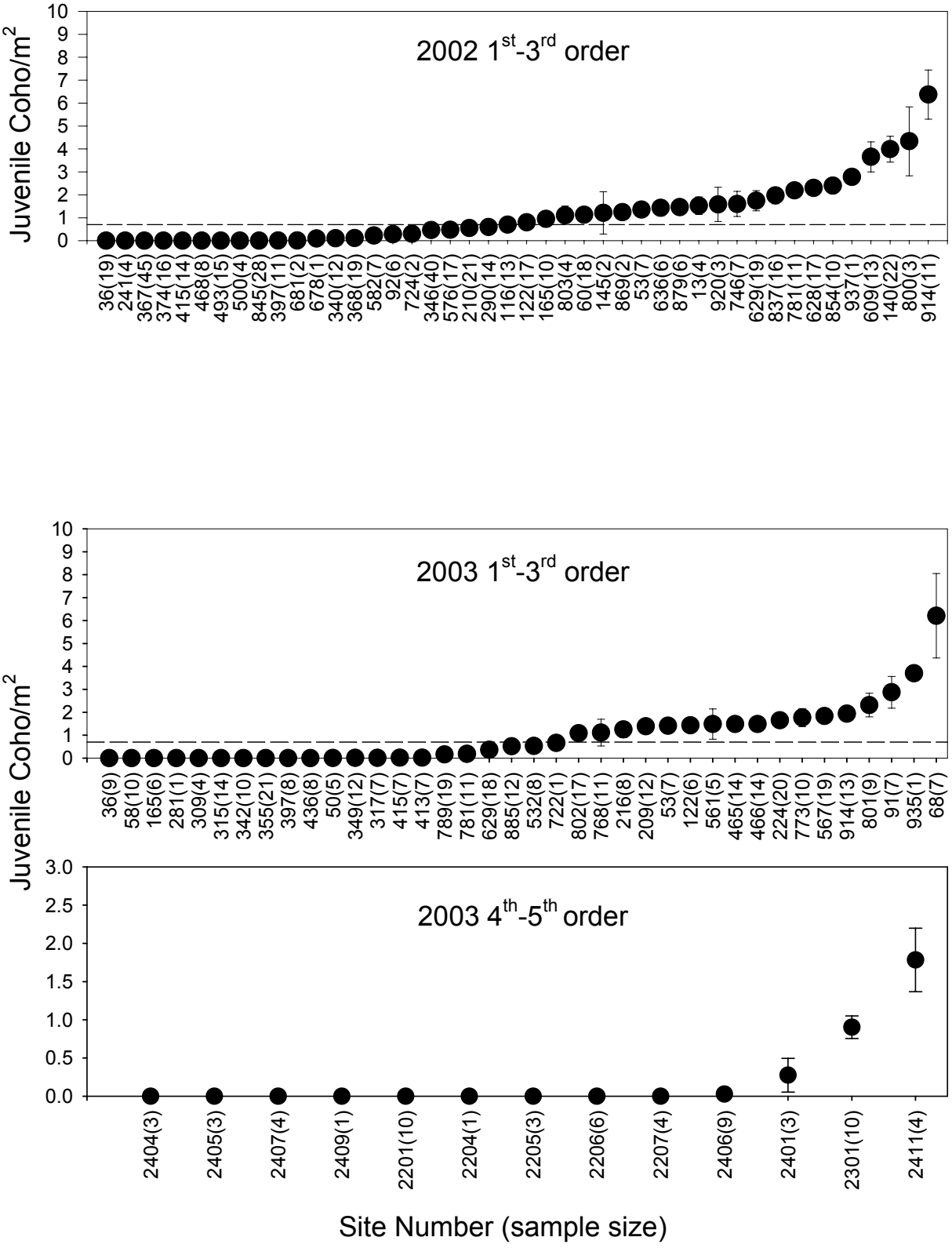

Figure 28. Mean density (and standard error) of juvenile coho at South Coast sites in 2002 and 2003 (see Appendices 1.1-1.2 for site data).

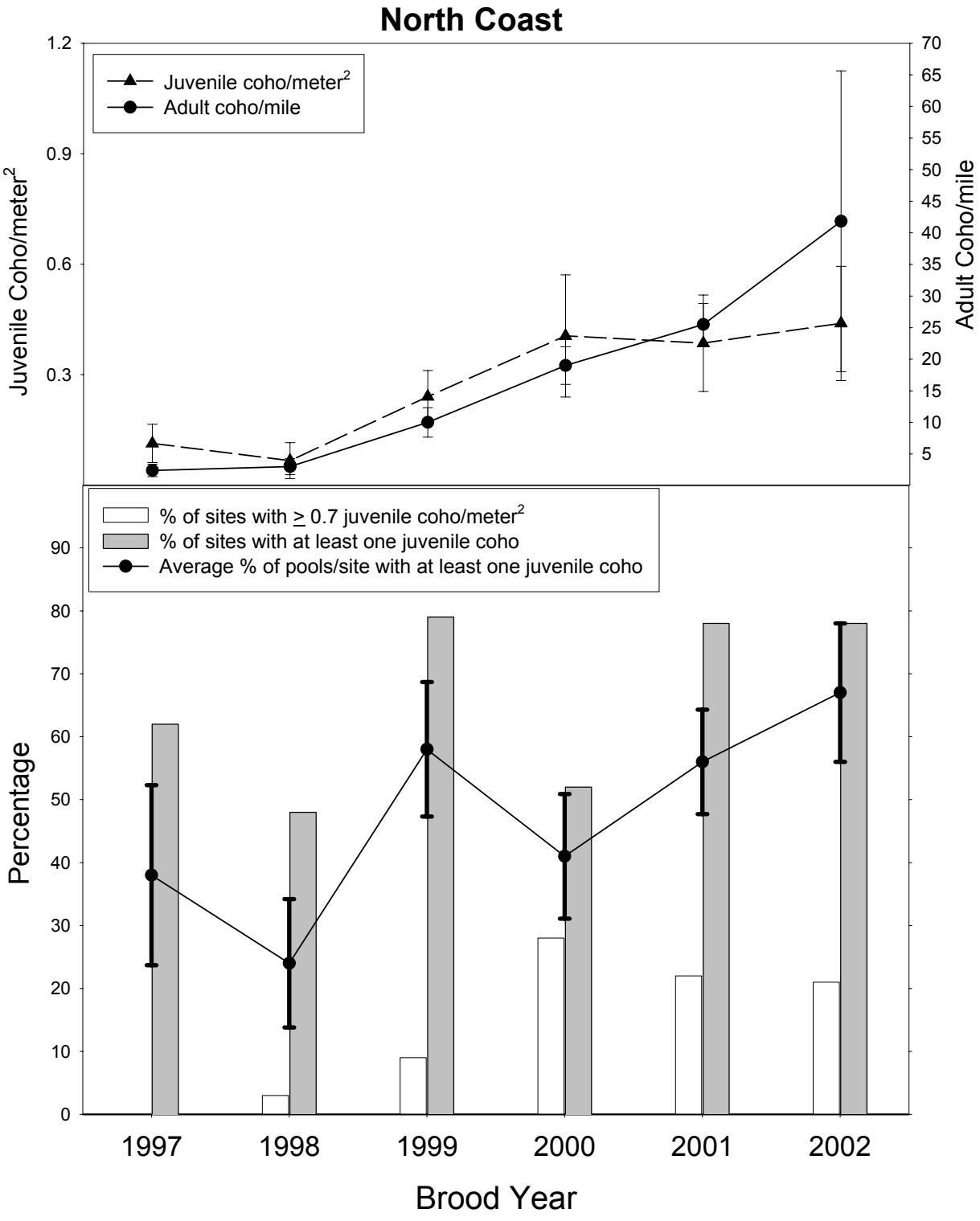

Figure 29. Abundance indices for adult and juvenile coho in the North Coast Monitoring Area, 1997-2002 brood years (juvenile data collected 1998-2003). Error bars represent 95% confidence intervals.

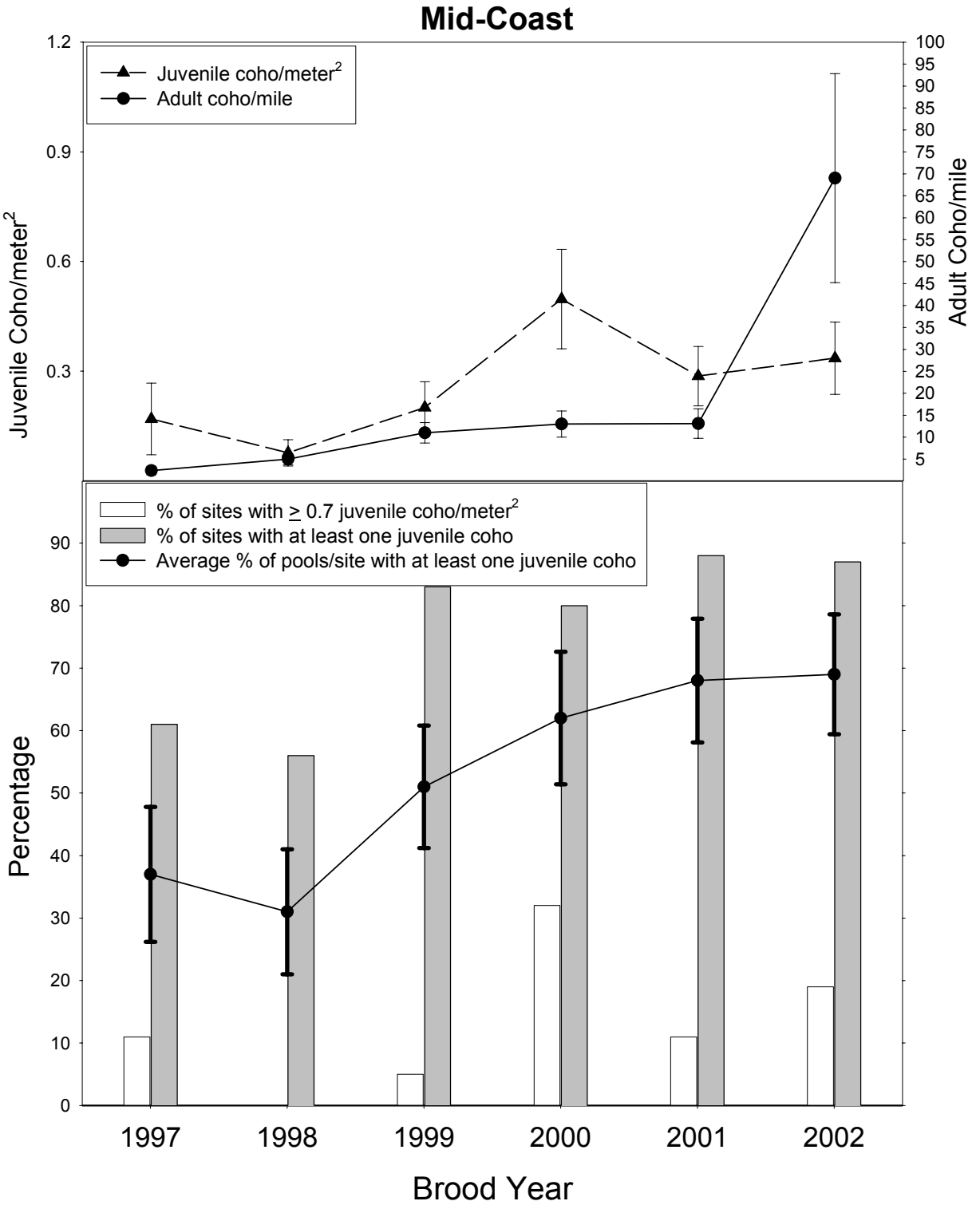

Figure 30. Abundance indices for adult and juvenile coho in the Mid-Coast Monitoring Area, 1997-2002 brood years (juvenile data collected 1998-2003). Error bars represent 95% confidence intervals.

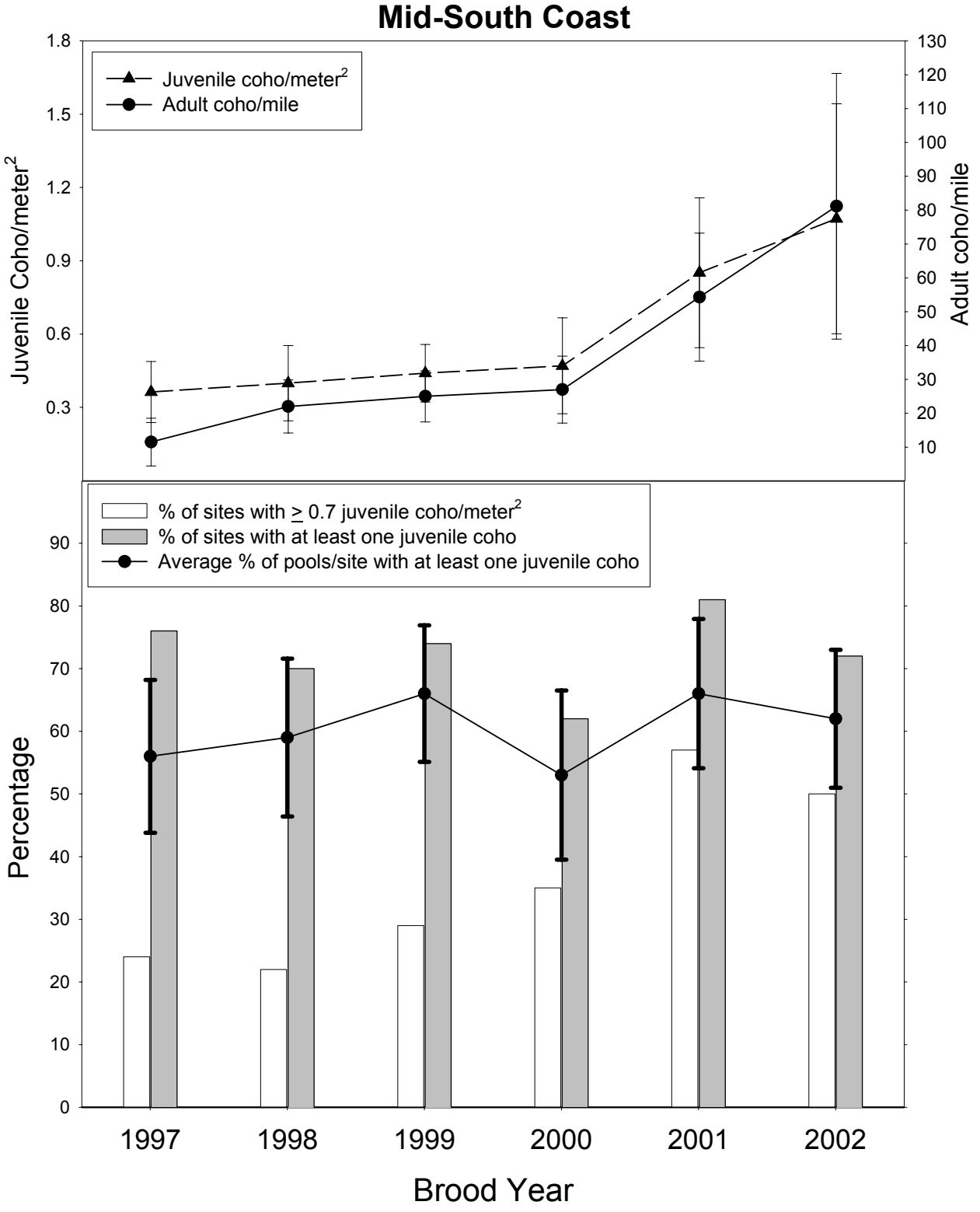

Figure 31. Abundance indices for adult and juvenile coho in the Mid-South Coast Monitoring Area, 1997-2002 brood years (juvenile data collected 1998-2003). Error bars represent 95% confidence intervals.

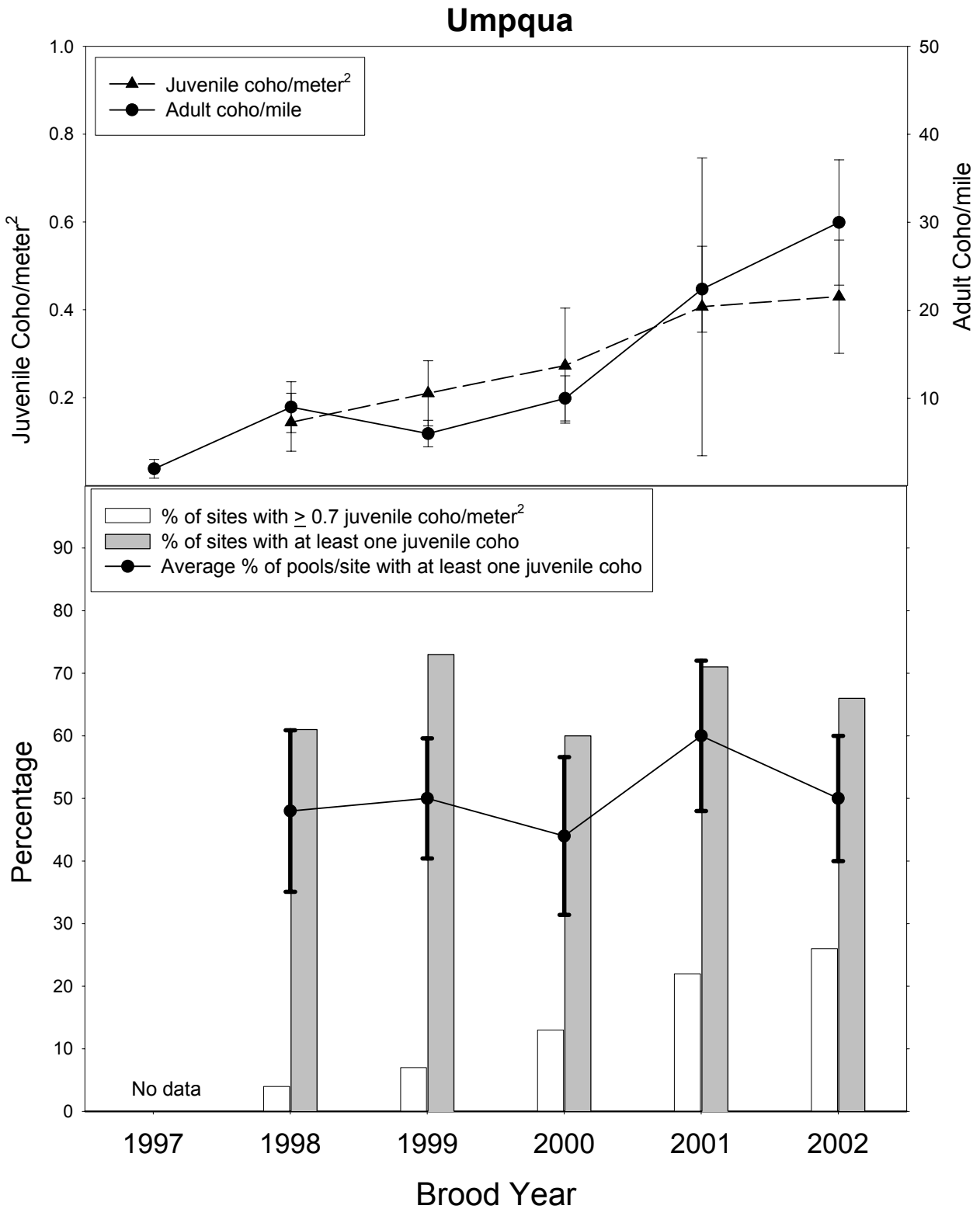

Figure 32. Abundance indices for adult and juvenile coho in the Umpqua Monitoring Area, 1997-2002 brood years (juvenile data collected 1998-2003). Error bars represent 95% confidence intervals. No juvenile data were collected for the 1997 brood.

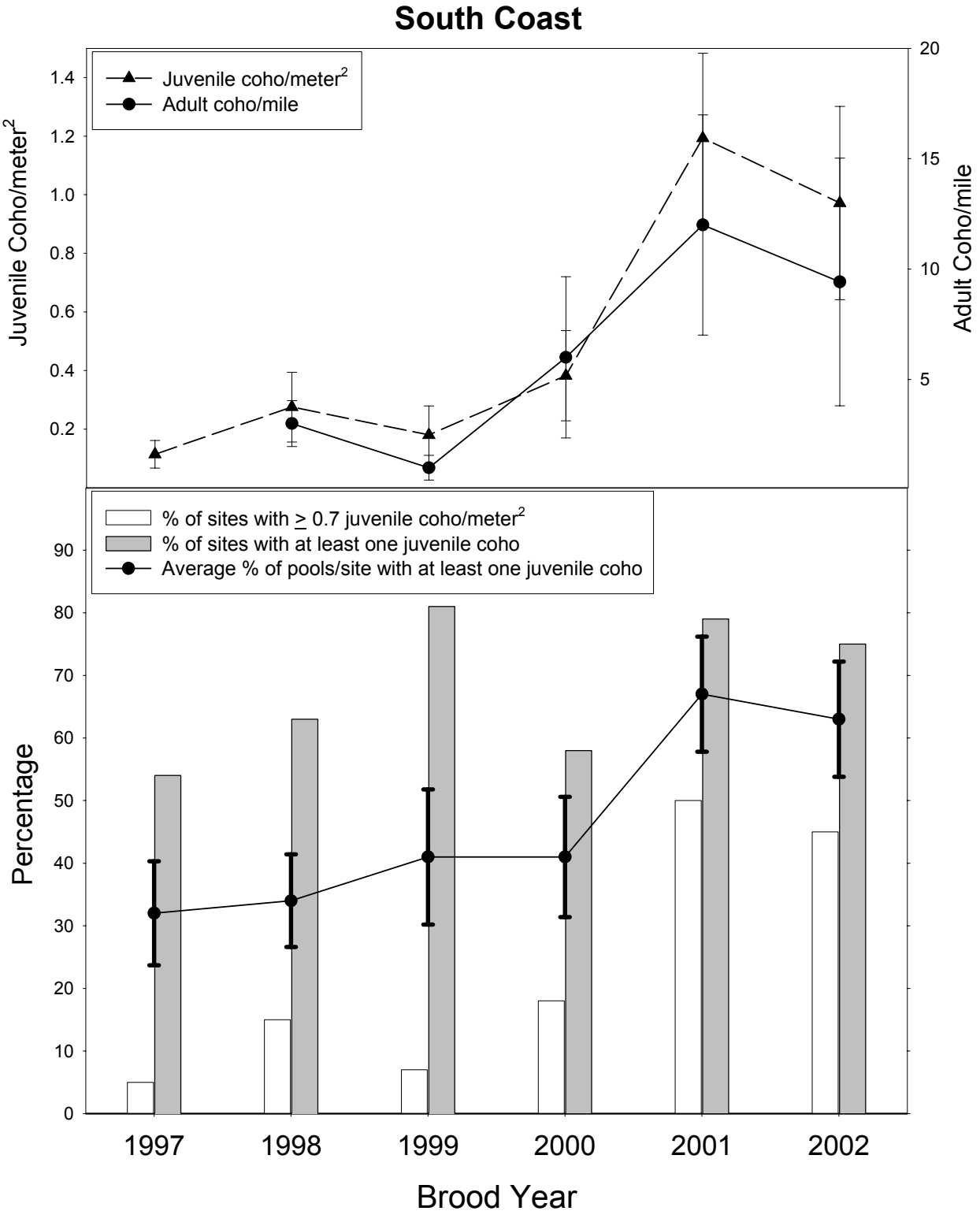

Figure 33. Abundance indices for adult and juvenile coho in the South Coast Monitoring Area, 1997-2002 brood years (juvenile data collected 1998-2003). Error bars represent 95% confidence intervals. No adult data are reported for adults in 1997 because prior to 1998, adult spawning surveys were conducted in a different sampling area than used for juvenile surveys.

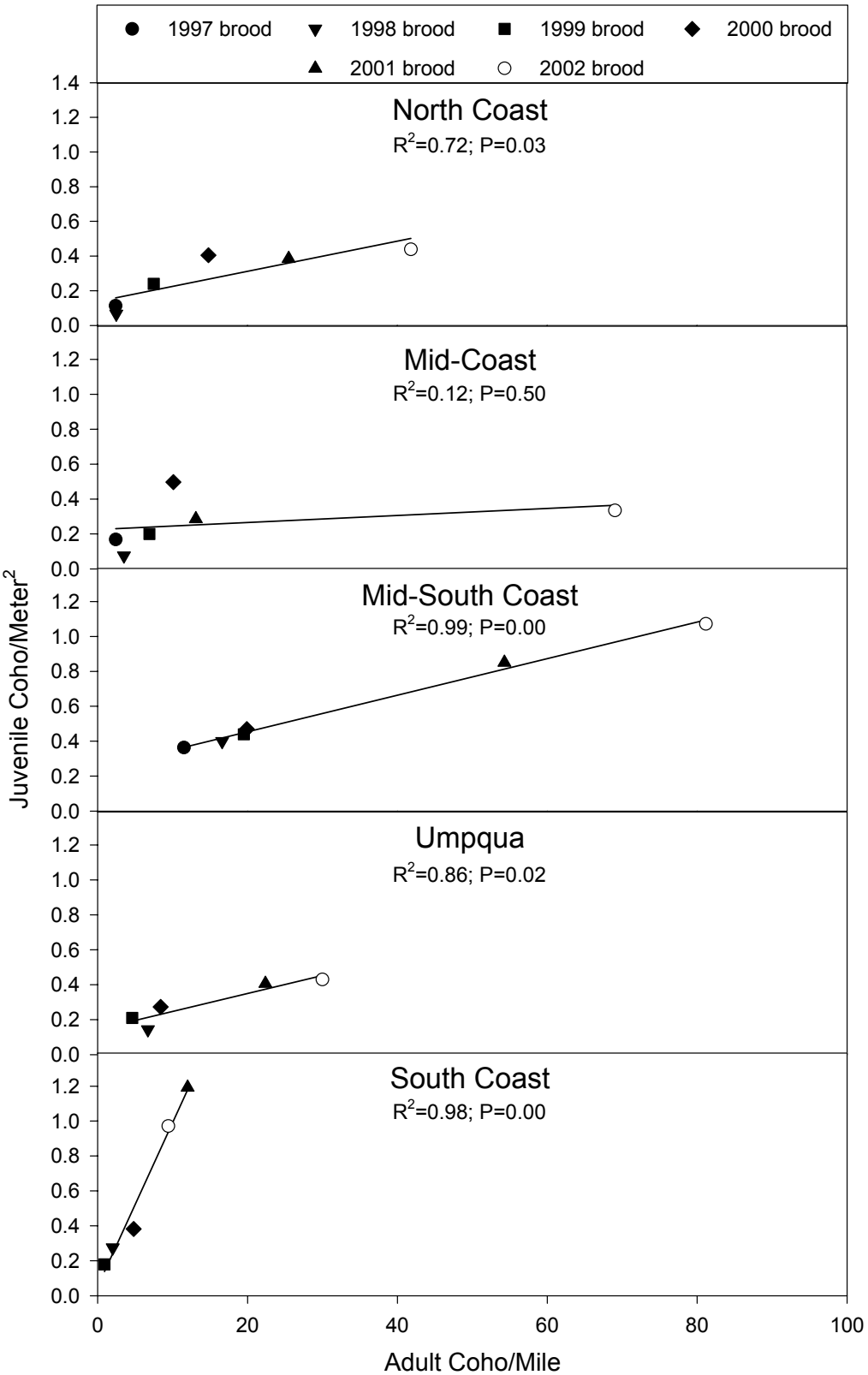

Figure 34. Relationship between the number of juvenile coho/m^2 and the number of adults/mile that produced them for each of the five Monitoring Areas on the Oregon Coast, 1997-2001 broods. No data are shown for the 1997 brood in the Umpqua because no juvenile data were collected. No data are shown for the 1997 brood in the South Coast because of differences in sampling areas for adults and juveniles.

Chapter 2: Smith River Steelhead and Coho Monitoring Verification Study: Results of Juvenile Salmonid Sampling, Summers 2002 and 2003

Introduction

Monitoring the status of salmonids in Oregon coastal streams is an important component of the Oregon Department of Fish and Wildlife's (ODFW's) contribution to the Oregon Plan for Salmon and Watersheds. Since 1998, ODFW has had a program to monitor adult and juvenile coho in Oregon coastal streams, and in 2002, ODFW expanded its monitoring program to include steelhead (see Chapter 1 of this report).

The monitoring plans for both coho and steelhead rely on the Environmental Mapping and Assessment Protocol (EMAP) (Stevens and Olsen 1999) random site selection process to select survey sites. Although this monitoring is being implemented coast-wide, no information is available at a large basin scale on the relationship of data collected to the actual population status of the fish being monitored. The goal of the Smith River Steelhead and Coho Monitoring Verification Study is to provide this information.

The purpose of this report is to summarize data collected on juvenile salmonids in Smith River during the summers of 2002 and 2003. This summary is divided into three parts: 1) the results of electrofishing in "wadeable" stream reaches ($\leq$ 60 km^2 basin area); 2) the results of basin-wide snorkel surveys; and 3) comparison of electrofishing and snorkel surveys.

Study Area

A map of the study area is shown in Figure 35. The study area begins above a waterfall approximately 48 km from the confluence of Smith River with the Umpqua River. The basin area above the falls is approximately 525 km^2 with approximately 463 km of mainstem and tributary streams at the 1:100,000 map scale.

The climate is Pacific Maritime with portions of the basin receiving up to 250 cm of rain annually, the majority of which falls in November through February. Red alder (*Alnus rubra*) with an understory of salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), and vine maple (*Acer circinatum*) dominate riparian vegetation.

Methods

Electrofishing

Sites electrofished for juvenile salmonids are restricted to wadeable sized streams ($\leq$ 60 km^2 basin area) that occur on a 1:100,000 digital map within the presumed rearing distribution of steelhead above Smith River Falls. The rearing distribution of juvenile steelhead was determined by combining three GIS databases: 1) ODFW's winter steelhead distribution database (Bowers, 2000); 2) ODFW's coho distribution database (Bowers, 2000); and 3) ODFW Salmonid Inventory Project's coho salmon distribution database (Steve Jacobs - ODFW, personal communication). Coho distribution databases were used in addition to the steelhead distribution database because there are a few instances where coho salmon were shown to have a farther upstream distribution than steelhead and presumably steelhead should be able to access all areas

accessible to coho. Two different coho distribution databases were used because there are slight differences between them, and there is no reason to assume that one database is more accurate than the other.

Once the sampling universe was identified, Environmental Monitoring and Assessment Program (EMAP) protocols (Diaz-Ramos et al. 1996) were used to randomly select 30-36 sites per year. To track individual brood years, a four-year rotating panel design (i.e. revisiting sites every four years) is used since the majority of Oregon coastal steelhead are four years old when they return to spawn.

The EMAP site selection process provides the geographic coordinates of each of the candidate sample sites. These points are printed onto topographic (topo) maps and loaded into a handheld Geographic Positioning System (GPS). The topo maps are then used to navigate to the approximate location of the sample point, while the GPS is used to find the precise location of the sample point.

Sampling begins at the sample point, and continues upstream on a habitat unit by habitat unit basis until a length of stream equal to approximately 20 active channel widths is sampled. Side channels entering the survey are not sampled. Independent population estimates are made of young-of-year trout (< 90 mm fork length), juvenile steelhead $\geq$ 90 mm, cutthroat $\geq$ 90 mm, and juvenile coho. Block nets are used at the tail and head of all fast water and pool units so that estimates can be obtained for each habitat unit.

A pass-removal estimate (Armour, et al. 1983) using a minimum of two passes is conducted in all units. Decisions on whether additional passes were necessary are based on the number of fish captured and the reduction in catch from one pass to the next. When 10 or fewer fish are caught on a pass, the next pass needs to have a 50% reduction or another pass is made. When more than 10 fish are captured, the next pass needs to be reduced by 67%. These rules apply independently to all species/size classes. In complex pools, fish captured during the pass-removal estimates are given a small notch in their upper caudal fin and released for a mark-recapture estimate (Armour, et al 1983). Marked fish are distributed throughout the pool so that they can mix with the remaining unmarked fish. Marked fish are given a minimum of one hour to recover in the pool prior to recapture efforts. Recapture efforts continued until a minimum of 50% of the released marked fish are recovered.

Fish lengths are measured to the nearest millimeter. All captured trout are measured, as are 50 coho from each site. A species identification is made for all measured trout regardless of size, with the category “unknown trout” used for smaller trout that cannot be field identified to species.

Habitat type is classified using ODFW’s Aquatic Inventory definitions for pools, glides, riffle/rapids, and dry stream channels (Moore et al. 1997). We measure the length (to nearest 0.1m) for all habitat units as well as the average width (to nearest 0.1m) and maximum depth (to nearest cm) of all wetted units. For all wetted habitat units, we also estimate substrate composition using the following categories: 1) silt and fine organic matter; 2) sand; 3) gravel (2-64mm); 4) cobble (64-256mm); 5) boulders (>256mm); and 6) bedrock, and counted the number of boulders $\geq$ one meter in diameter that are in or touching the wetted channel.

Snorkel Surveys

In both years, snorkel surveys were attempted at electrofishing sites prior to electrofishing, and at two additional stream sites. In addition, snorkel surveys were conducted at 9 randomly selected sites in the larger, non-wadeable (>60 km^2 basin area) mainstem portions of Smith River above Smith River Falls.

Snorkel surveys began at the EMAP sample point and ended 1,000 meters upstream. A two-person snorkel crew conducted surveys at the wadeable sites. Up to four people conducted snorkel surveys in the non-wadeable reaches. In wadeable reaches, crewmembers either alternated the pools they snorkeled or one crewmember snorkeled the entire reach. In the non-wadeable reaches, crewmembers snorkeled side-by-side and summed their individual counts. To reduce problems associated with snorkeling in shallow or fast water habitat, only pools $\geq$ 6 m^2 in surface area and $\geq$ 40 cm deep were snorkeled. We measured the maximum pool depth and estimated the length and average width of all snorkeled pools.

In all wadeable and most non-wadeable reaches, snorkel methodology involved a single upstream pass through each pool. In some of the larger, non-wadeable reaches, divers surveyed downstream. Counts of the number of juvenile coho, cutthroat, steelhead, unknown trout, Chinook salmon, blackside dace, and redside shiner were recorded for each pool. Trout < 90 mm were not counted. After snorkeling, the underwater visibility of each pool was ranked on a scale of 0 to 3 where: 0 = not snorkelable due to an extremely high amount of 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.

Electrofishing Data Analysis

Length frequency histograms were generated for juvenile coho, cutthroat $\geq$ 90 mm, steelhead $\geq$ 90 mm, and trout < 90 mm. The percentage of sites with at least one fish was calculated for each of the four species/size classes. The total population of each species/size class present at a sample site was determined by summing the individual species/size class population estimates for all the habitat units sampled. This total estimated population was then divided by the sum of the lengths of all habitat units in the survey (both wet and dry) to obtain the number of fish per meter of stream channel. An estimate of the total population of fish in the wadeable streams above Smith River Falls was calculated by multiplying the average number of fish/meter for all electrofished sites by the total length of stream channels in the sampling universe (338.4 km). The 95% confidence interval around each species/size class population estimate was determined using the statistical analysis outlined by Stevens (2002).

Snorkel Survey Data Analysis

Only pools with a visibility rank of two or three were used in data analysis. IN previous years the proportion of trout $\geq$ 90 mm estimated by electrofishing that were cutthroat and steelhead was used to reclassify unknown trout $\geq$ 90 mm observed by divers. The reclassified fish were then added to the observed number of $\geq$ 90 mm cutthroat and steelhead prior to calculating metrics for the diver count data. In 2002-

2003, trout ≥ 90 mm were directly identified by divers in the field as either steelhead or cutthroat.

For each snorkel site, the number of fish/m^2 of pool habitat was calculated for each of the three species/size classes by averaging the density estimates for each pool at that site. A basin-wide density for each of the three species/size classes was obtained by averaging the individual site densities. The 95% confidence interval around each species/size class population estimate was determined using the statistical analysis outlined by Stevens (2002).

Electrofishing and Snorkel Survey Comparisons

Ultimately the two survey methods will be compared against trends in the actual population of adult steelhead and coho returning to Smith River. It is, however, too early in the project for such comparisons since four years of data do not allow for trend analysis. Comparisons can be made, however, between the yearly results of the two juvenile monitoring methods. To do this, only sites surveyed by both survey types were used. The same metrics used to analyze the larger snorkel site dataset were used to compare electrofishing and snorkel surveys.

Results

Electrofishing Surveys

A total of 31 and 32 sites were visited for electrofishing surveys in 2002 and 2003, respectively (Figure 36). A total of 2,596 meters of stream channel were sampled in 2002, of which 322 meters were dry. In 2003 a total of 3928 meters of stream channel were surveyed, of which 543 meters were dry. Seven sites were completely dry in 2002 and three sites were completely dry in 2003. In both years, 12 sites had greater than 50% pool habitat by length, and 9 and 10 sites had greater than 50% riffle/rapid habitat by length in 2002 and 2003, respectively. The average wetted channel width ranged from 1.0-6.6 m and 0.3-9 m for 2002 and 2003, respectively. Maximum water depth was 88 cm and 130 cm for 2002 and 2003, respectively. Of the wetted sites in 2002, bedrock substrate dominated 7 sites, silt/sand 6 sites, and gravel/cobble/boulder 11 sites. In 2003, bedrock substrate dominated 4 sites, silt/sand 5 sites, and gravel/cobble/boulder 9 sites. The physical characteristics of the reaches electrofished in the Smith River study area during the summers of 2002 and 2003 are diagramed in Figures 37-41, and summarized in Appendices 5.1 and 5.2.

Figures 42-45 show the spatial pattern of abundance of juvenile salmonids in the Smith River basin as determined by electrofishing during the summers of 2002 and 2003. Juvenile coho were the most widespread in both years, occurring at 88% and 79% of the sites in 2002 and 2003, respectively. In both years cutthroat ≥ 90 mm were found at 79% of the sites. Trout < 90 mm were found at 79% and 72% of sites in 2002 and 2003, respectively, and steelhead ≥ 90 mm were the least widespread in both years, occurring at only 42% and 31% of sites in 2002 and 2003, respectively. These results are similar to those obtained in the summer of 2000 and 2001(Rodgers 2001, 2002). In both years, population estimates showed that juvenile coho were the most abundant, followed in order by trout < 90 mm, cutthroat ≥ 90 mm, and steelhead ≥ 90 mm (Table 8). Of the trout ≥ 90 mm collected by electrofishing, 70.9% and 74.5% were identified as

cutthroat in 2002 and 2003, respectively, and 29.1% and 25.5% were identified as steelhead for the respective years.

Table 8. Population estimates of juvenile coho, juvenile steelhead ≥ 90 mm, cutthroat trout ≥ 90 mm, and trout < 90 mm in the wadeable stream reaches above Smith River Falls based on data obtained by electrofishing.

Species	2002			2003		
	Population Estimate	95% CI	CI % of Estimate	Population Estimate	95% CI	CI % of Estimate
Coho	335,342	72,628	22	320,260	89,270	28
≥ 90 mm Steelhead	7,537	4,178	55	4,353	3,089	30
≥ 90 mm Cutthroat	24,647	8,580	35	16,920	5,081	71
< 90 mm Trout	63,014	30,052	48	33,583	11,291	34

Figure 46 compares the electrofishing population estimates for each species/size class obtained from 2000-2003. There were no differences in abundance between 2002 and 2003 for coho (p = 0.80), cutthroat ≥ 90 mm (p = 0.13) or steelhead ≥ 90 mm (p = 0.23), but trout < 90 mm declined in 2003 relative to 2002 (p = 0.07).

Length frequency histograms obtained by electrofishing for each species are shown in Figures 47-48. For the two years respectively, the fork lengths of juvenile coho averaged 61 and 63 mm, juvenile steelhead ≥ 90 mm averaged 115 and 123 mm, cutthroat ≥ 90 mm averaged 135 and 141 mm, and trout < 90 mm averaged 54 and 58 mm. For trout 60-89 mm, 36% and 62% were identified as steelhead, 39% and 28% as cutthroat, and 25% and 14% as unidentified trout, for 2002 and 2003, respectively.

Snorkel Surveys

The snorkel crew visited 44 sites during the summer of 2002. Of these, nine sites were either dry or had no pools meeting the minimum size and/or depth criteria. In 2002, 33 sites were snorkeled, 22 were in common with electrofishing sites, two were sites not visited by the electrofishing crew, and 9 were in larger stream reaches outside the "wadeable" stream sampling universe for electrofishing surveys (Figure 49). In 2003 the snorkel crew visited 48 sites, of which 15 were dry or had no pools meeting the minimum size and/or depth criteria. In 2003, 28 sites were snorkeled, 17 were in common with electrofishing sites, two were sites not visited by the electrofishing crew, and 9 were in larger stream reaches outside the "wadeable" stream sampling universe for electrofishing surveys (Figure 49). Appendices 6.1 and 6.2 summarize fish counts at snorkel sites.

Of trout ≥ 90 mm that were classified by divers as either cutthroat or steelhead in 2002, 67.4% were identified as cutthroat and 32.6% as steelhead. In 2003 these proportions were 55.6% and 44.4% for cutthroat and steelhead, respectively. These proportions are slight underestimates of cutthroat and slight overestimates of steelhead relative to direct counts from electrofishing (above).

For both years, divers observed the highest density of all three species in the wadeable stream reaches (Table 9). In 2002, coho were observed at a greater portion of

sites in wadeable streams than non-wadeable streams, but were observed at all sites in 2003. For cutthroat and steelhead ≥ 90 mm, the percentage of sites with at least one fish was highest in the wadeable stream reaches for both years. Figures 50-51 show the percent of pools at each snorkeled site that contained juvenile fish, and Appendices 7.1-7.3 show the spatial distribution of fish occurrence, relative to the snorkel sites.

Table 9. The average fish density and percentage of sites with at least one fish in pools snorkeled at wadeable and non-wadeable sites in Smith River, summer 2001.

Year and parameter	All snorkel sites			Snorkel sites in wadeable streams			Snorkel sites in non-wadeable streams		
	Coho	≥ 90 mm Steelhead	≥ 90 mm Cutthroat	Coho	≥ 90 mm Steelhead	≥ 90 mm Cutthroat	Coho	≥ 90 mm Steelhead	≥ 90 mm Cutthroat
2002									
Fish/m^2	0.430	0.021	0.033	0.579	0.030	0.046	0.034	0.001	0.001
95% CI	0.011	<0.001	<0.001	0.015	<0.001	<0.001	<0.001	<0.001	<0.001
% of sites with at least one fish	86	55	91	92	67	96	78	22	78
2003									
Fish/m^2	0.622	0.030	0.008	0.910	0.043	0.012	0.014	0.001	.0001
95% CI	0.038	<0.001	<0.001	0.059	<0.001	<0.001	<0.001	<0.001	<0.001
% of sites with at least one fish	96	79	82	100	84	84	100	67	78

Electrofishing and Snorkel Survey Comparisons

For sites where both snorkel and electrofishing surveys were conducted, divers observed 78% of the coho density estimated by electrofishing, but in 2003 electrofishing density detected 83% of the density estimated by snorkeling (Table 10). Electrofishing density estimates for steelhead were 34% and 16% of that observed by snorkeling in 2002 and 2003, respectively. For cutthroat, divers observed 82% of the density estimated by electrofishing in 2003, but in 2003 electrofishing estimates were 34% of that observed by snorkeling. For coho, snorkel and electrofishing surveys detected equal numbers of sites with at least one fish in both years, and in 2002 for cutthroat and steelhead, snorkeling surveys observed at least one fish at more sites than electrofishing surveys. In 2003 cutthroat were detected at more sites with snorkeling than electrofishing.

Three factors probably contribute to differences between snorkel surveys and electrofishing surveys: 1) undercounting by either method of the actual number of fish present; 2) differences in abundance in the 1,000 meters of stream at each site surveyed by divers and the 7-325 meter stream reaches surveyed by electrofishing; and 3) differences in the size of pools sampled by snorkeling and electrofishing. Differences

between the two methods do not, however, mean that one is better at monitoring the status of salmonids in Smith River. The question of how well the two methods of monitoring juvenile abundance track with trends in the actual abundance of salmonids as determined by adult population estimates can be answered only with additional years of data necessary for trend analysis.

Table 10. The average density and number of sites with at least one coho, cutthroat, or steelhead as determined by snorkel and electrofishing surveys at sites sampled by both methods in Smith River tributaries, summers 2002 and 2003.

Year and parameter	Snorkel			Electrofish		
	Coho	≥ 90 mm Steelhead	≥ 90 mm Cutthroat	Coho	≥ 90 mm Steelhead	≥ 90 mm Cutthroat
2002						
Fish/m^2	0.621	0.032	0.050	0.798	0.011	0.041
95% CI	0.02	<0.001	<0.001	0.059	<0.001	<0.001
Number of sites with at least one fish	20	14	21	20	10	17
% of sites with at least one fish	91	64	96	91	46	77
2003						
Fish/m^2	0.812	0.037	0.010	0.671	0.006	0.029
95% CI	0.061	<0.001	<0.001	0.665	<0.001	<0.001
Number of sites with at least one fish	17	14	15	17	10	16
% of sites with at least one fish	100	82	88	100	59	94

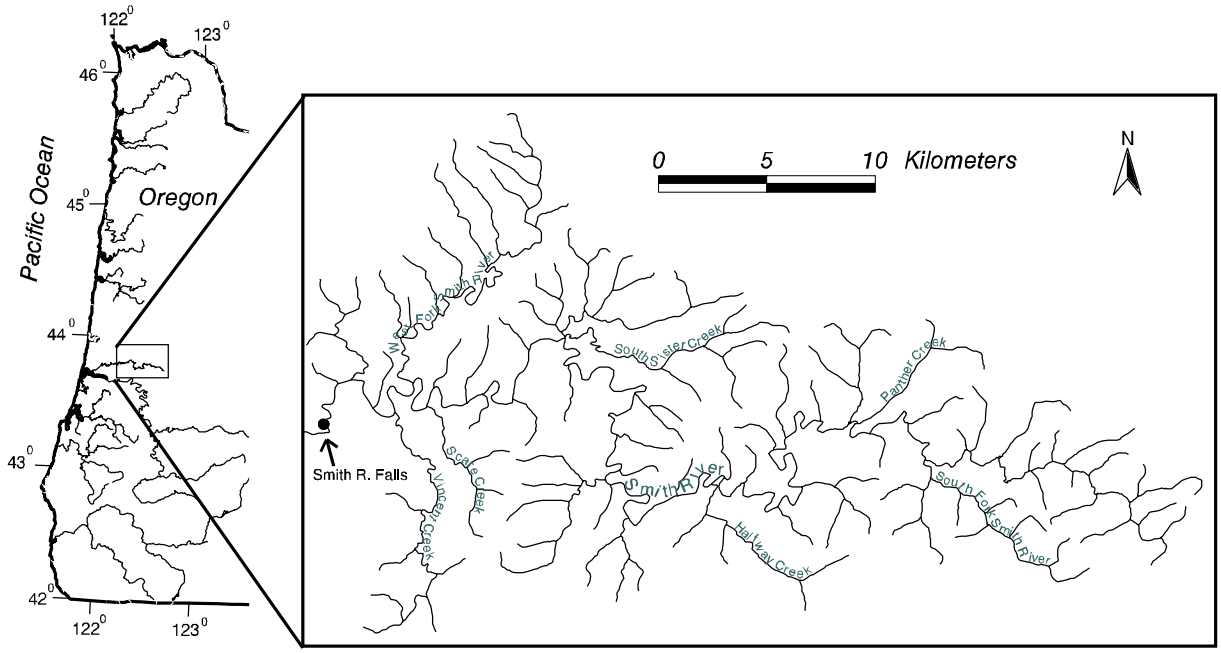

Figure 35. Location of Smith River study area.

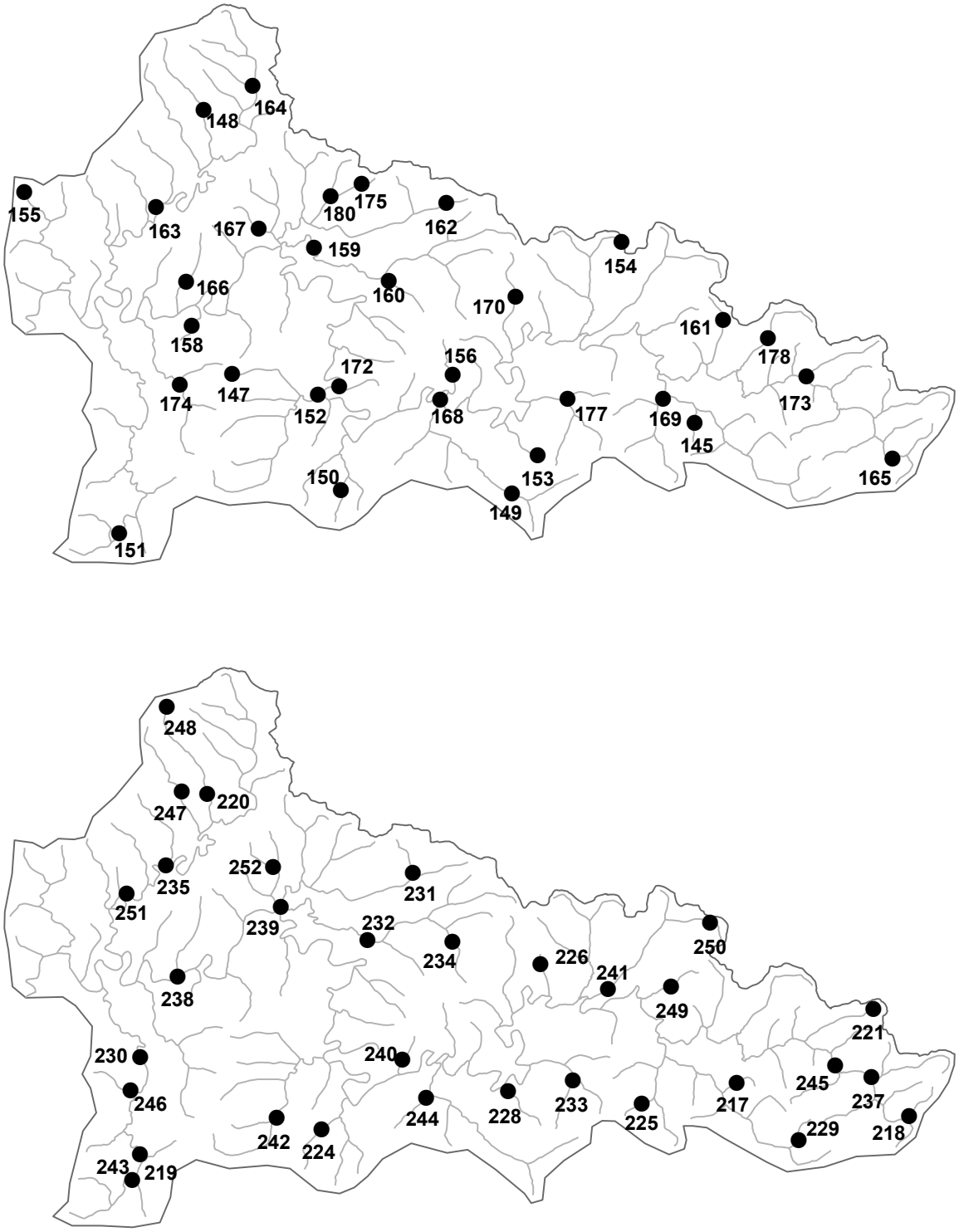

Figure 36. Location of sites electrofished for juvenile salmonid abundance in Smith River, summers 2002 (top panel) and 2003 (bottom panel). The numbers next to sample points are the site numbers for referencing data in Appendices 5.1 and 5.2.

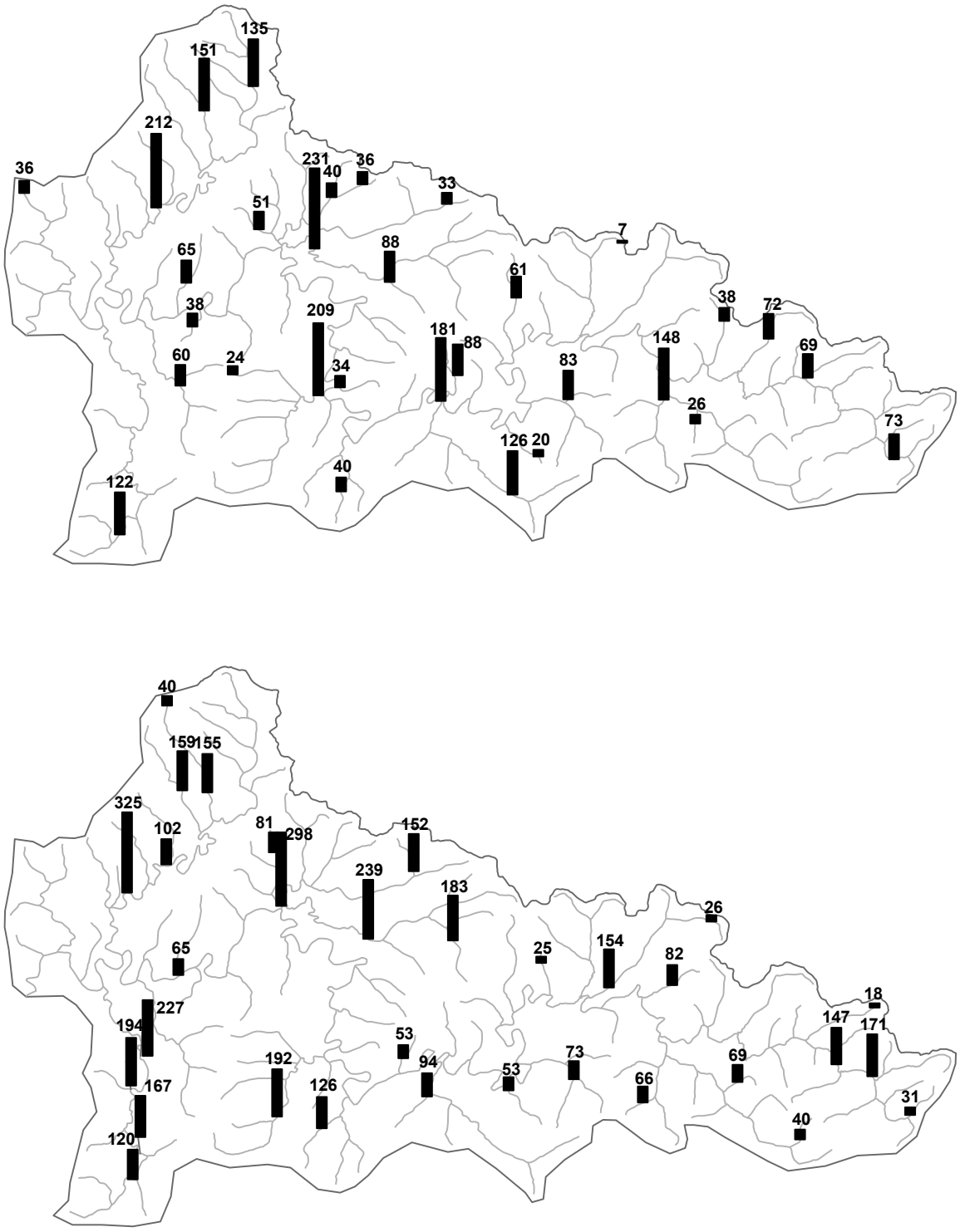

Figure 37. Length of sites sampled by electrofishing in Smith River, summers 2002 (top panel) and 2003 (bottom panel). Bars indicate the length of the site relative to other sites. The numbers above each bar is the length of the site (in meters).

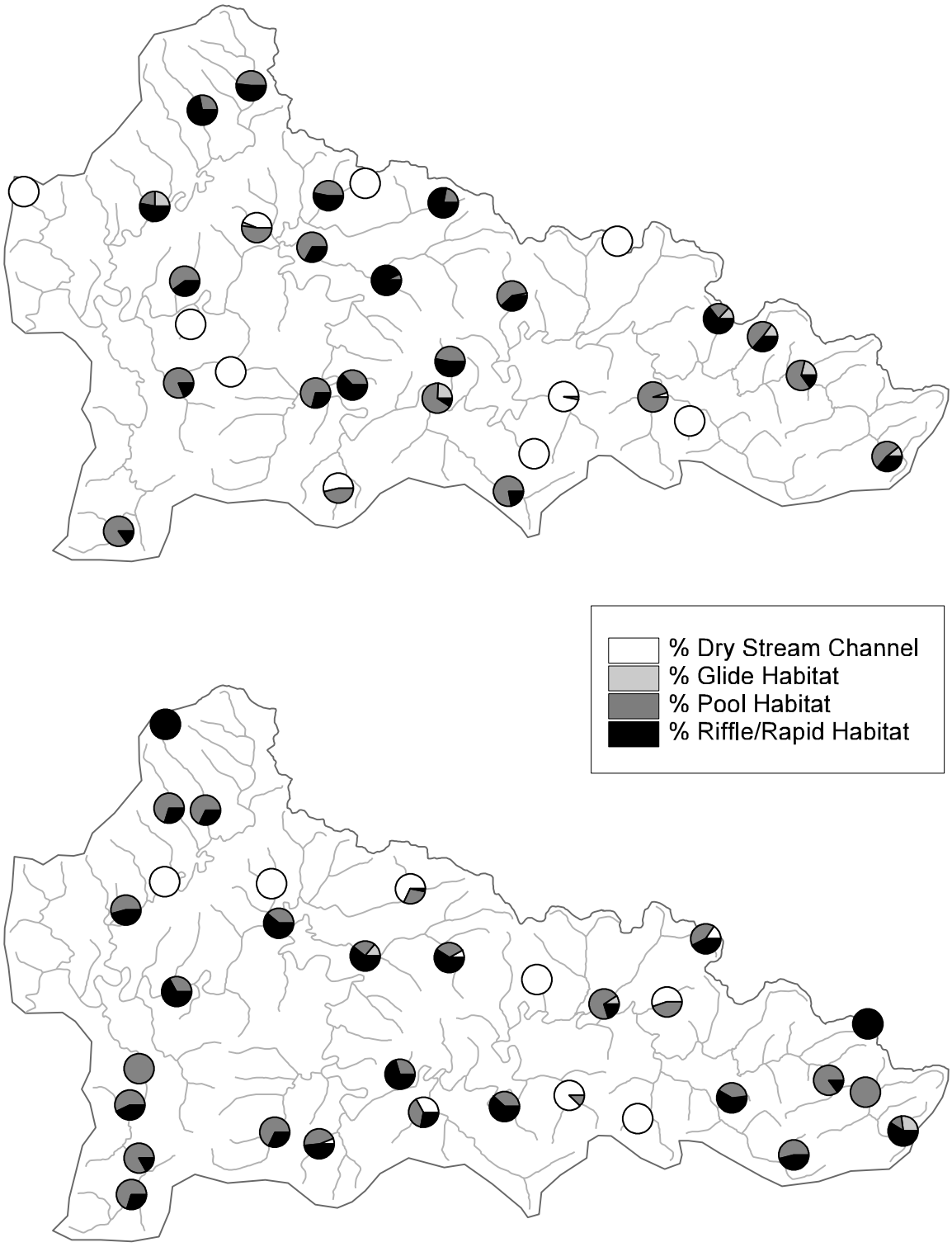

Figure 38. Percentage of the site length that was dry stream channel, glide, pool, or riffle/rapid habitat for each site electrofished in Smith River during the summers of 2002 (top panel) and 2003 (bottom panel).

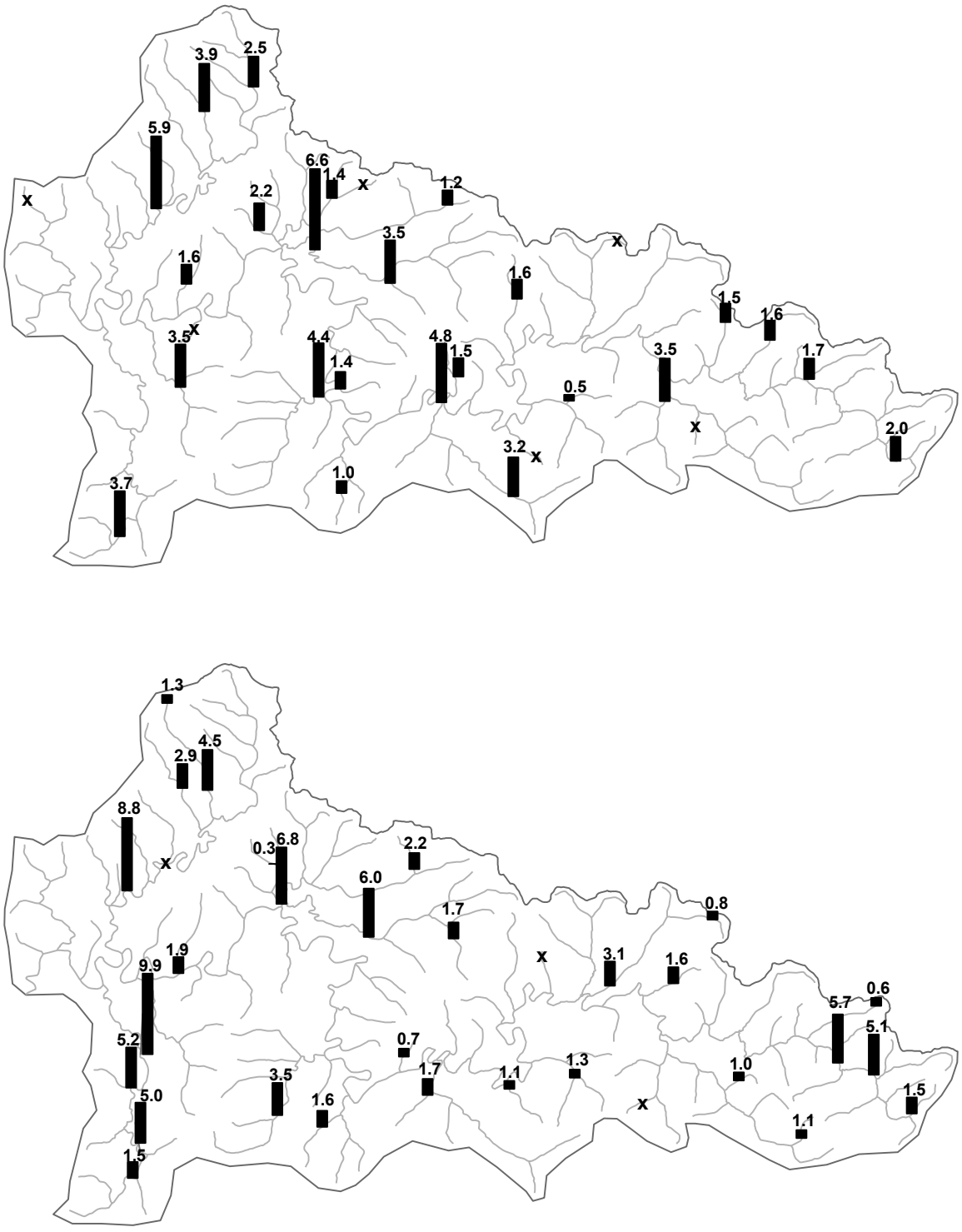

Figure 39. Average wetted width of sites electrofished in Smith River, summers 2002 and 2003. Bars indicate the width of the site relative to other sites. Sites that were completely dry are indicated with an "X". The number above each bar is the average width of the site (in meters).

Figure 40. Maximum water depth of sites electrofished in Smith River, summers 2002 (top panel) and 2003 bottom panel). Bars indicate the maximum depth of the site relative to other sites. Sites that were completely dry are indicated with an “X”. The number above each bar is the maximum depth of the site (in centimeters).

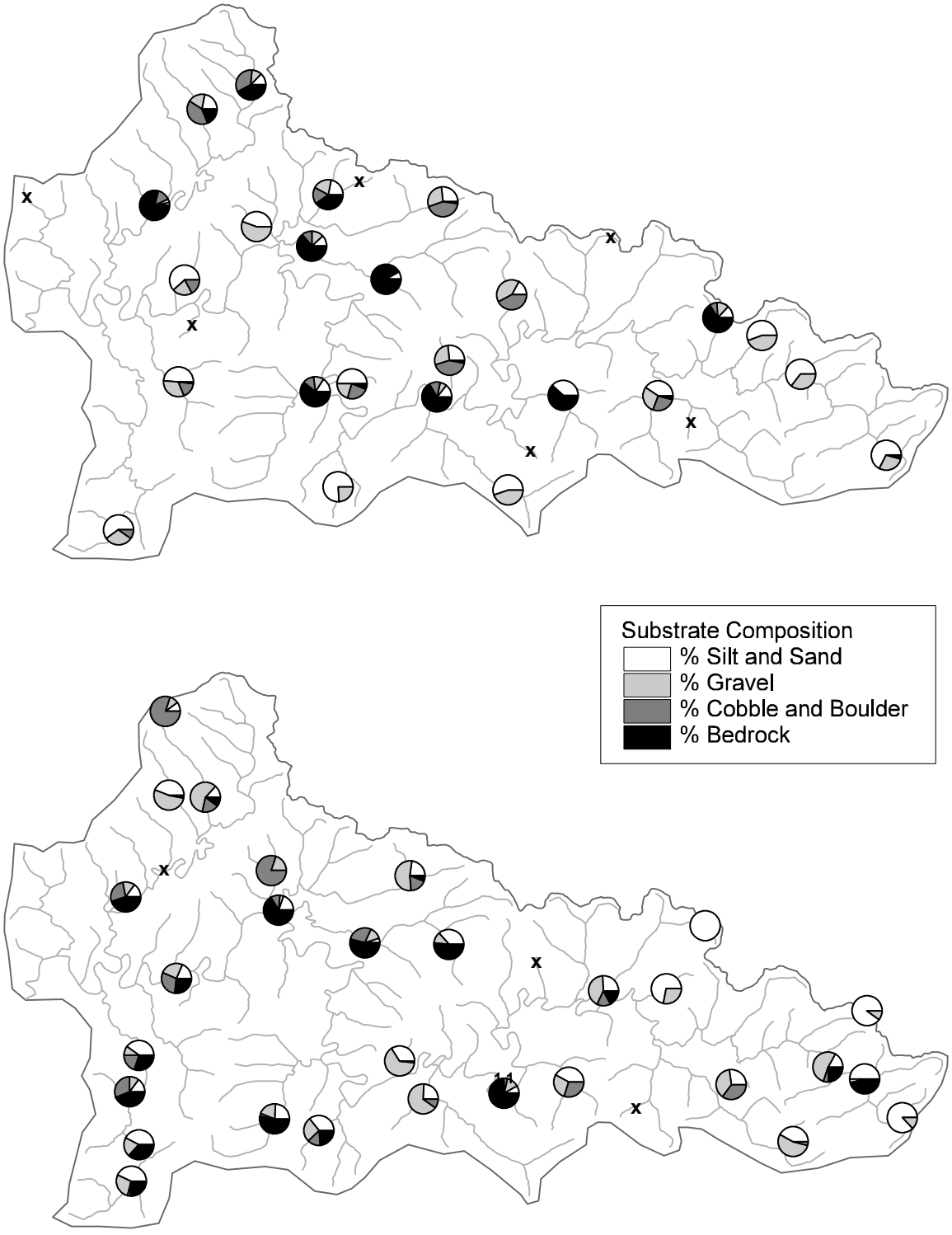

Figure 41. Substrate composition of wetted stream channels at sites electrofished in Smith River, summers 2002(top panel) and 2003 (bottom panel). Sites that were completely dry are indicated with an “X”.

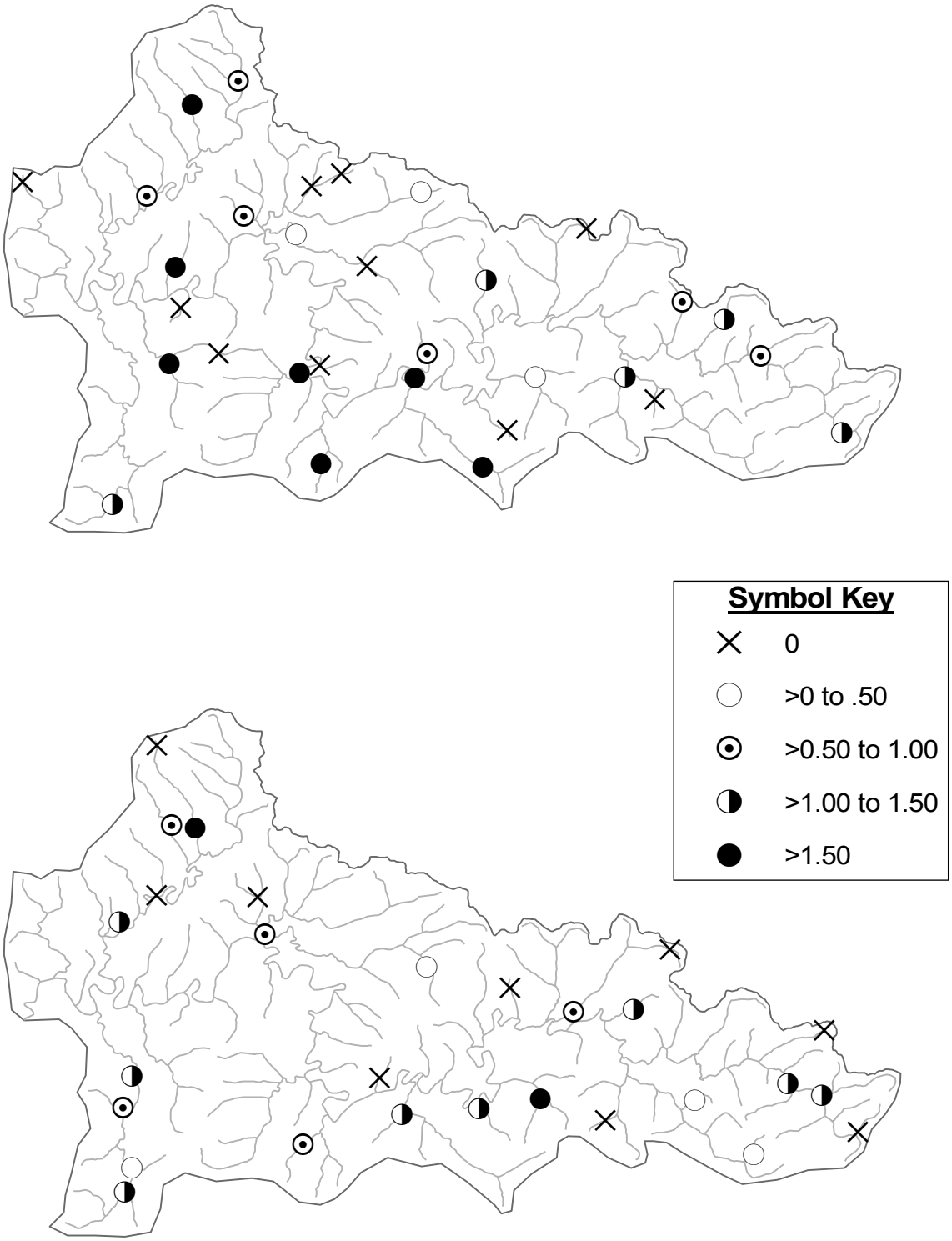

Figure 42. Number of juvenile coho per meter of stream as determined by electrofishing in Smith River tributaries, summers 2002 (top panel) and 2003 (bottom panel).

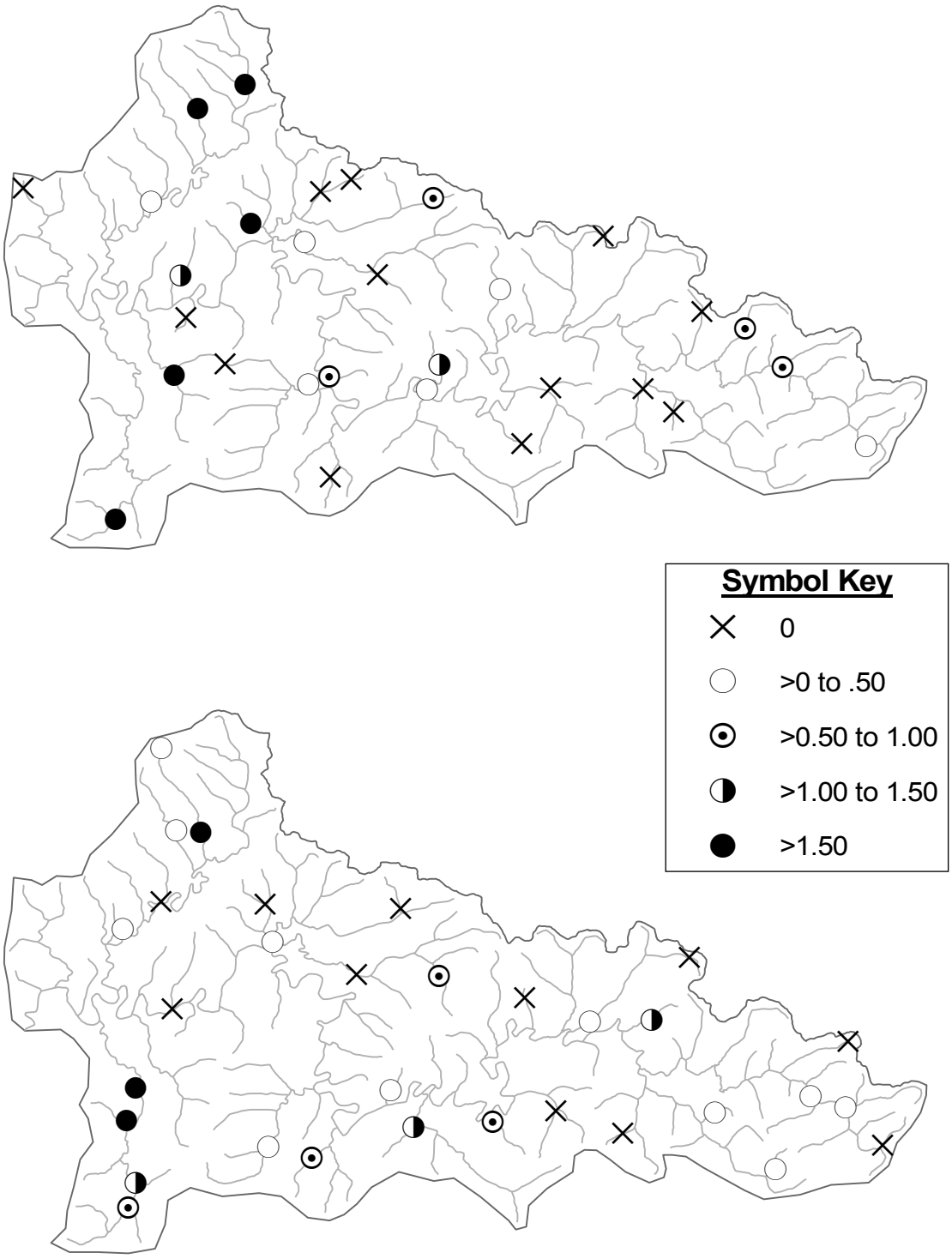

Figure 43. Number of cutthroat trout (>90 mm fork length) per meter of stream as determined by electrofishing in Smith River tributaries, summers 2002 (top panel) and 2003 (bottom panel).

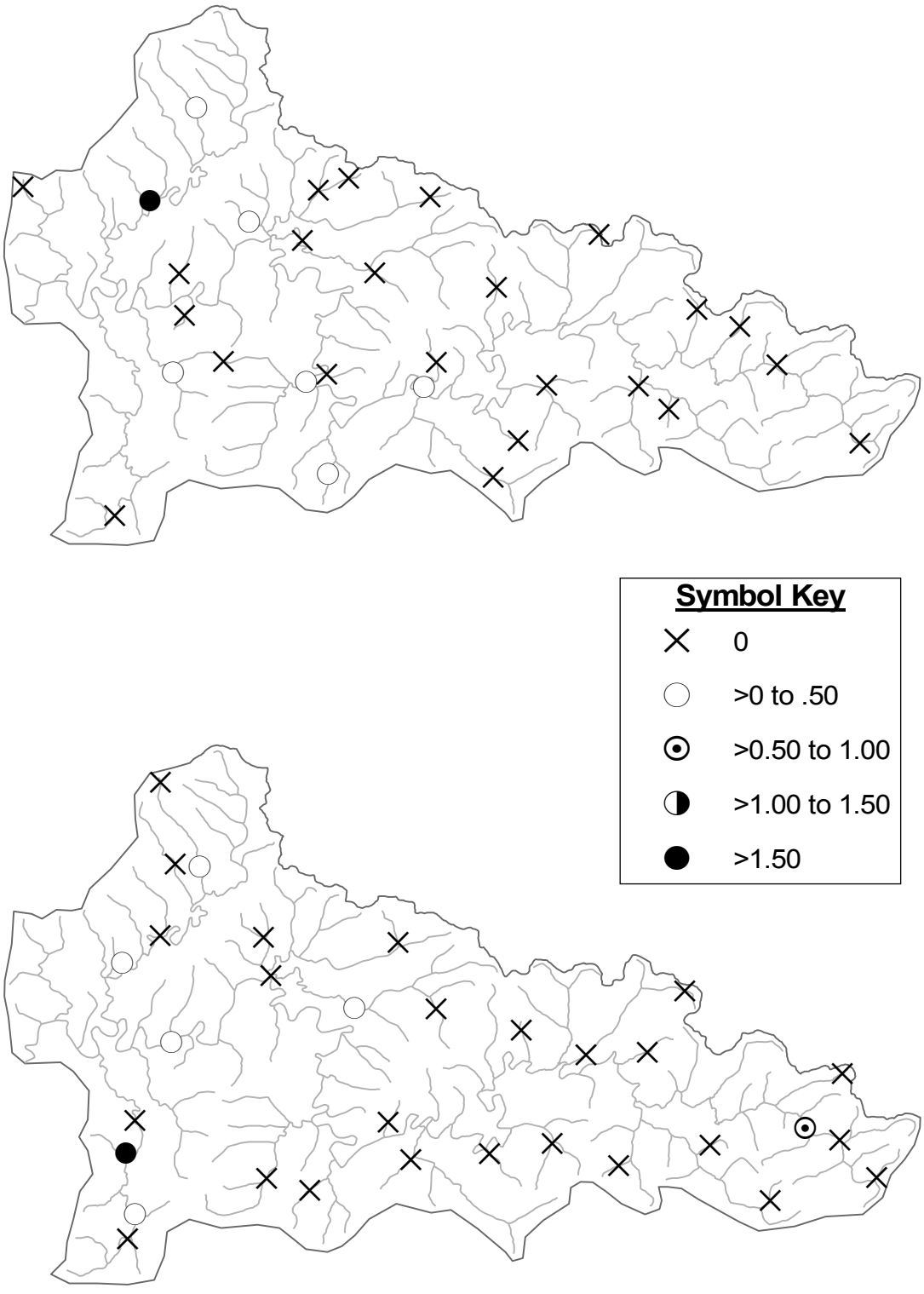

Figure 44. Number of steelhead (≥ 90 mm fork length) per meter of stream as determined by electrofishing in Smith River tributaries, summers 2002 (top panel) and 2003 (bottom panel).

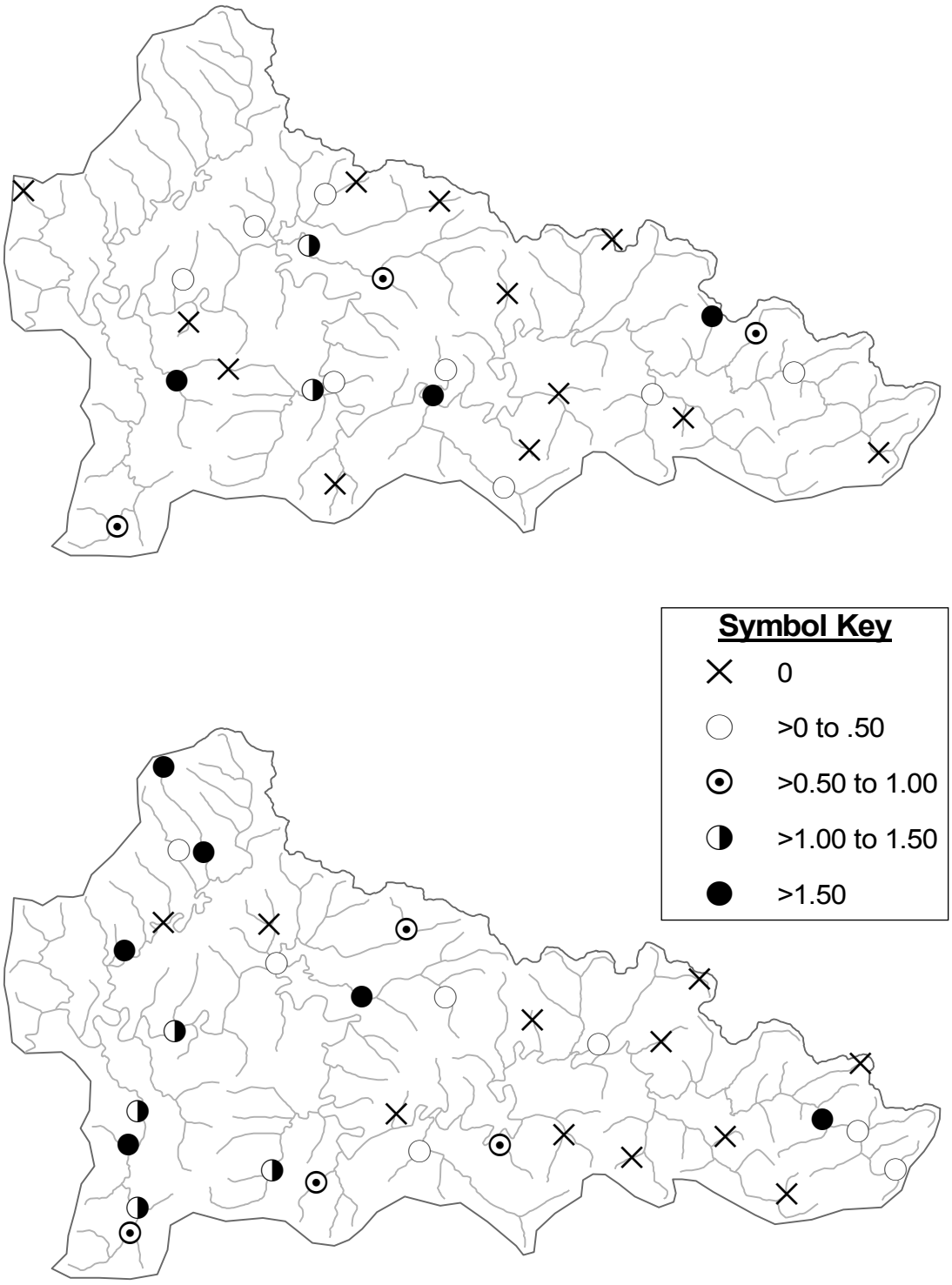

Figure 45. Number of juvenile trout (< 90 mm fork length) per meter of stream as determined by electrofishing in Smith River tributaries, summers 2002 (top panel) and 2003 (bottom panel).

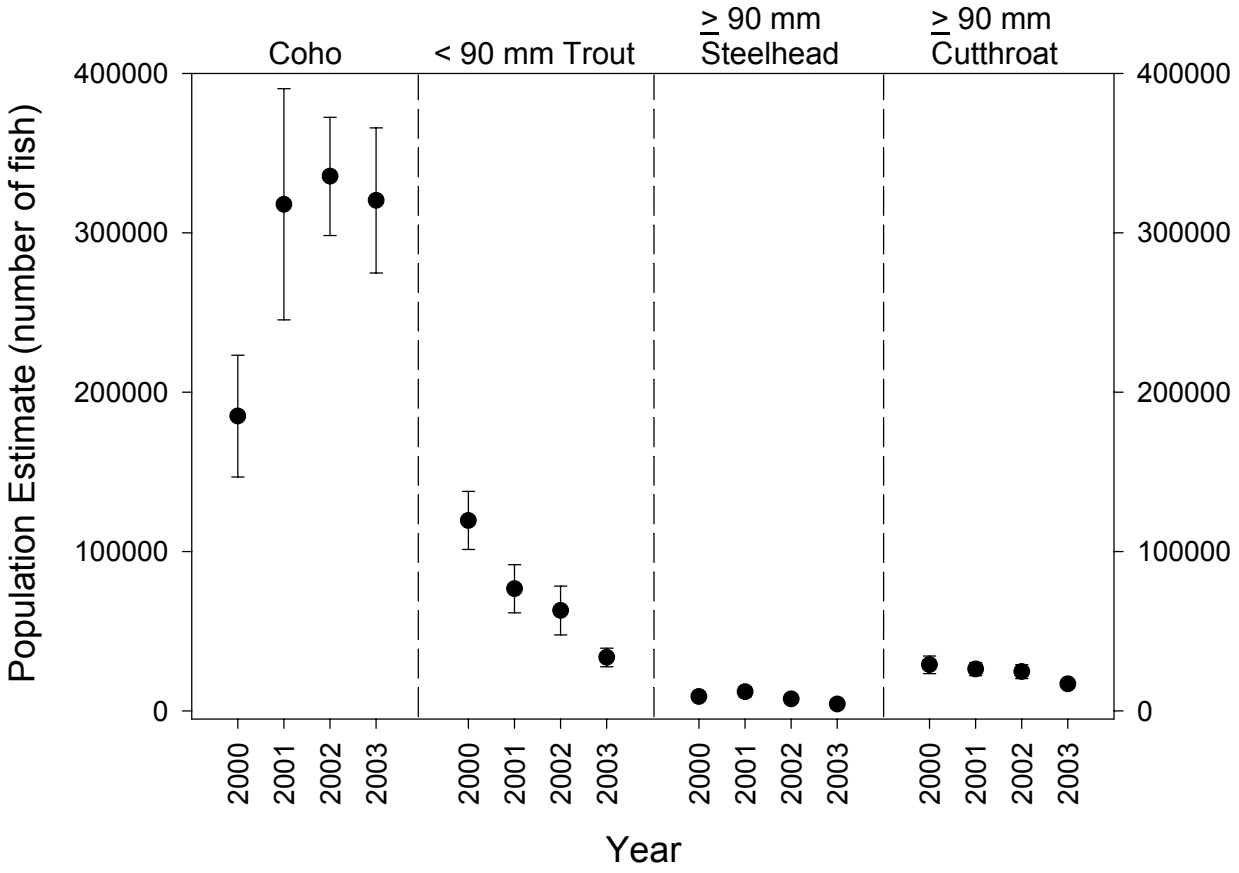

Figure 46 Estimated population (and standard error bars around estimate) of juvenile salmonids, based on electrofishing surveys in Smith River tributary streams.

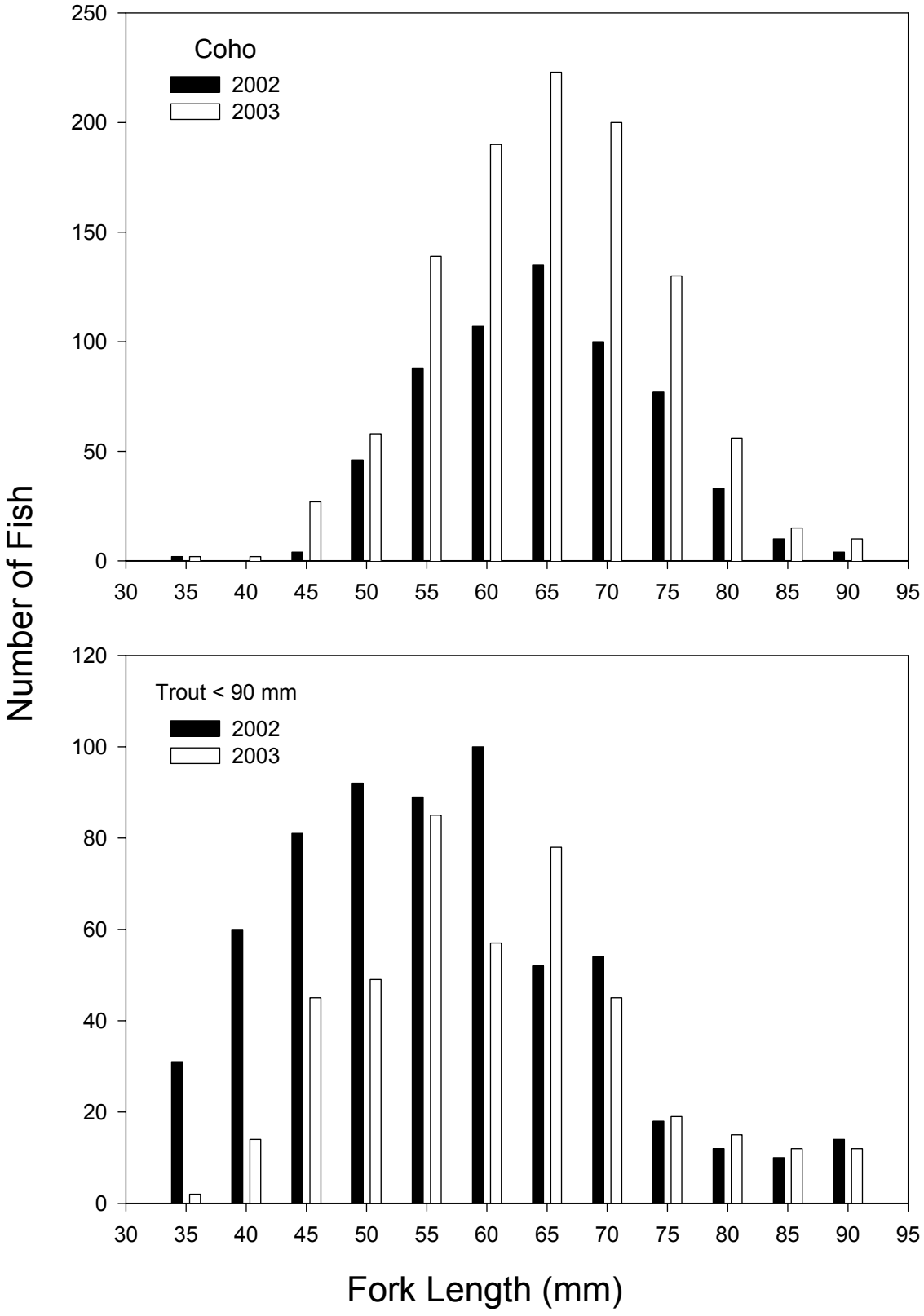

Figure 47. Length frequency of juvenile coho salmon and trout < 90 mm at sites electrofished in Smith River, summers 2002 and 2003.

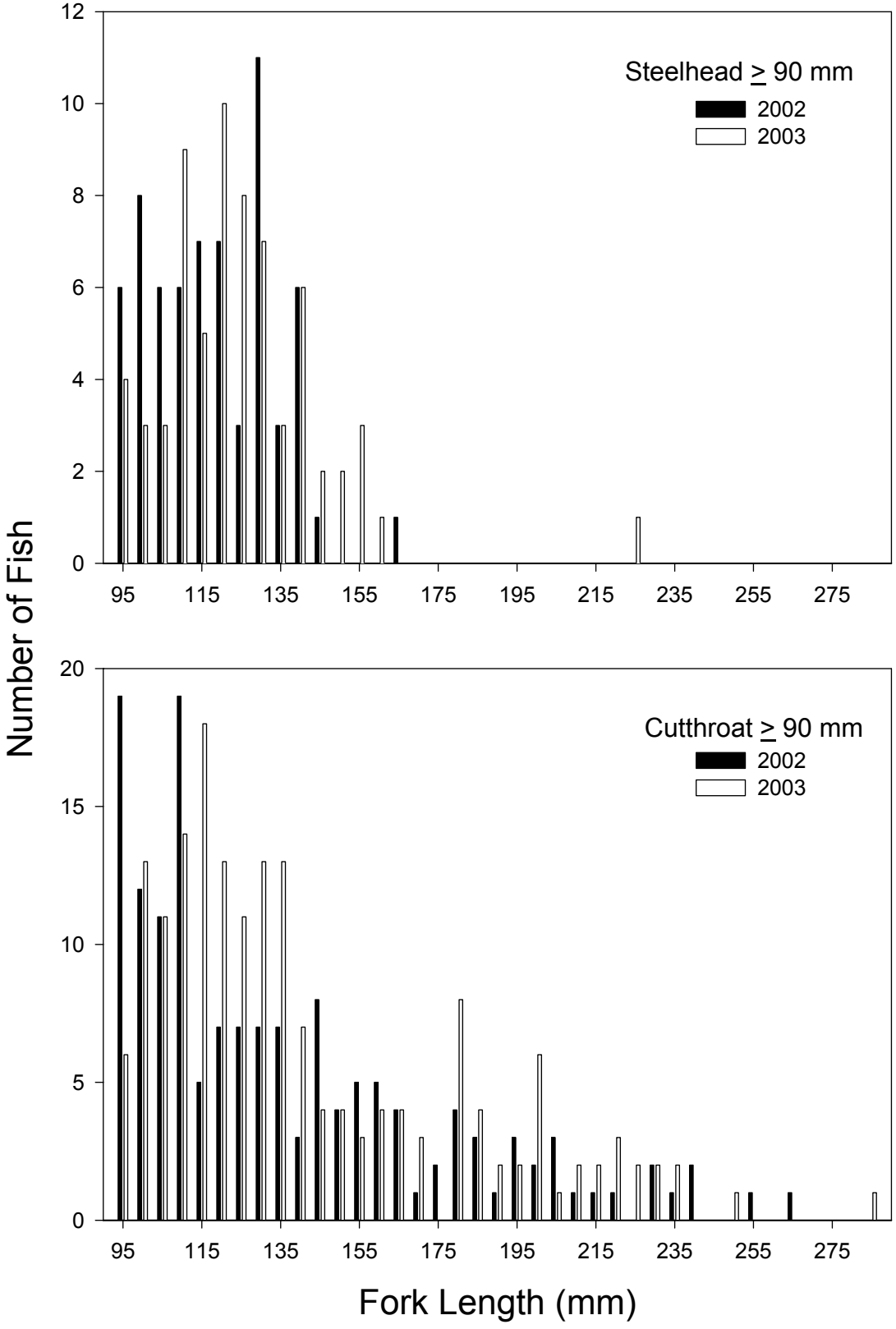

Figure 48. Length frequency of steelhead ≥ 90 mm and cutthroat ≥ 90 mm at sites electrofished in Smith River, summers 2002 and 2003.

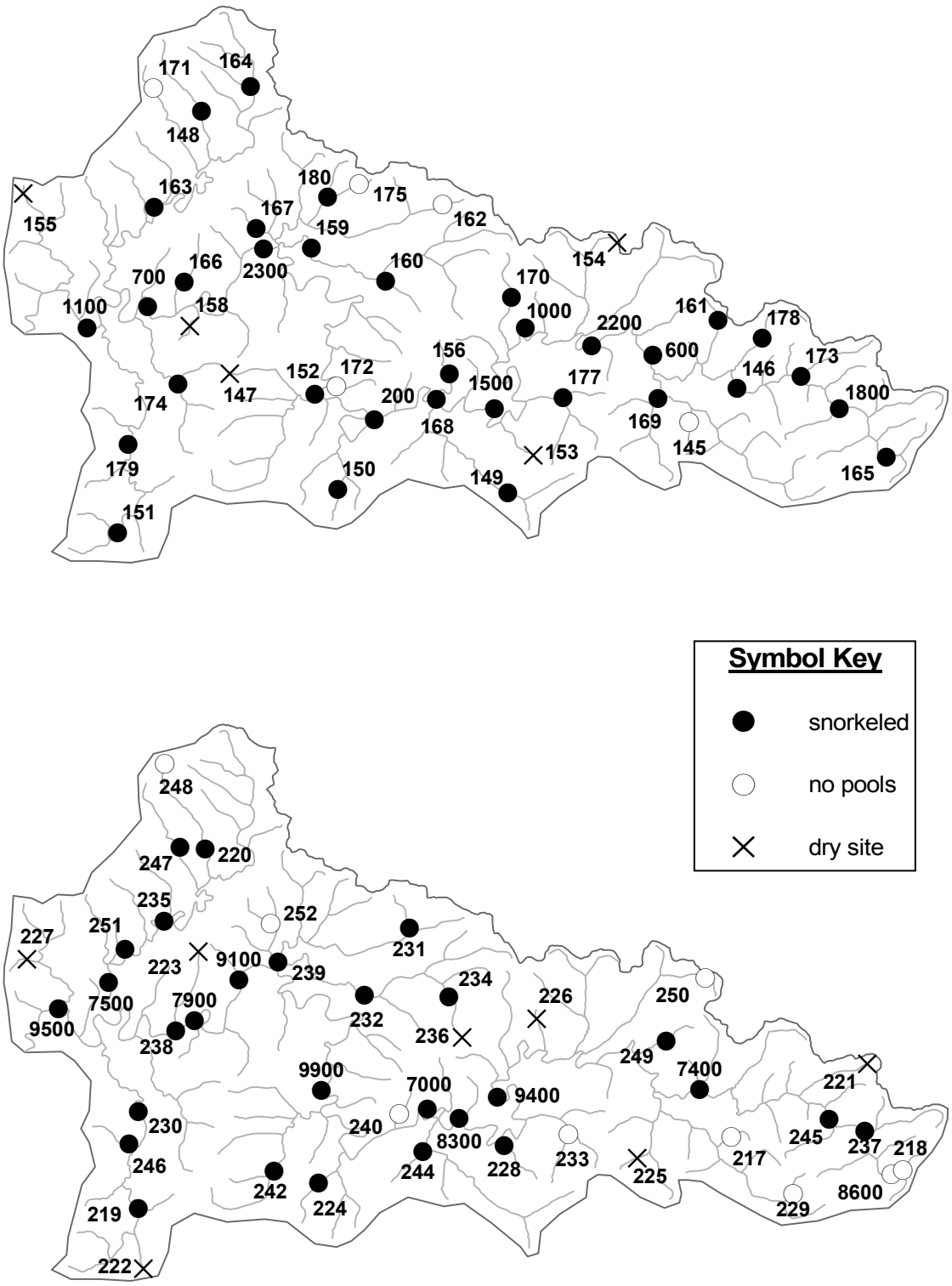

Figure 49. Location of Smith River sites visited by the snorkel crew during the summers of 2002 (top panel) and 2003 (bottom panel). Labels are site numbers for reference to Appendices 6.1-6.2.

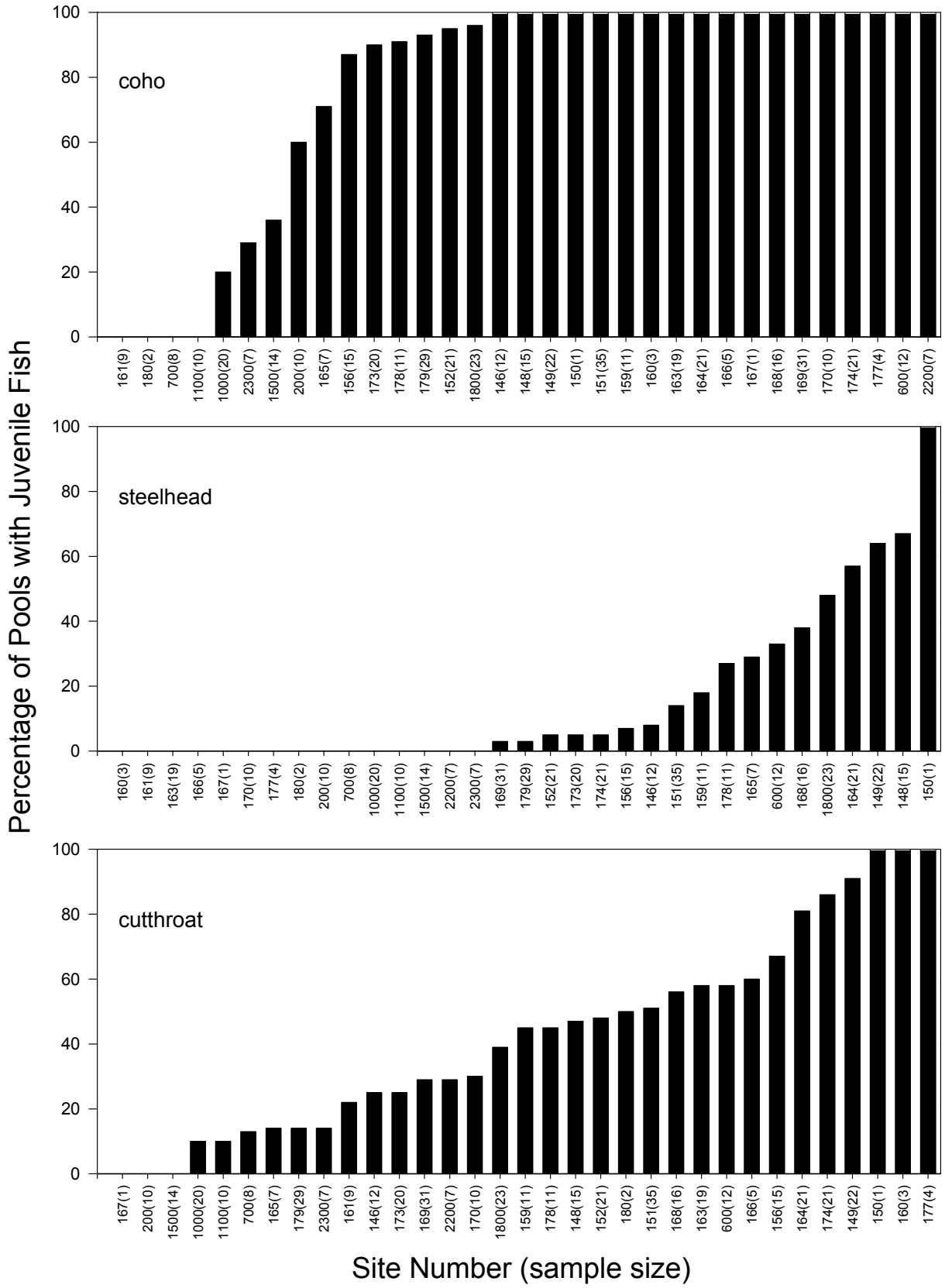

Figure 50. Percent of pools at each site snorkeled in Smith River tributaries that contained at least one juvenile salmonid in the summer of 2002.

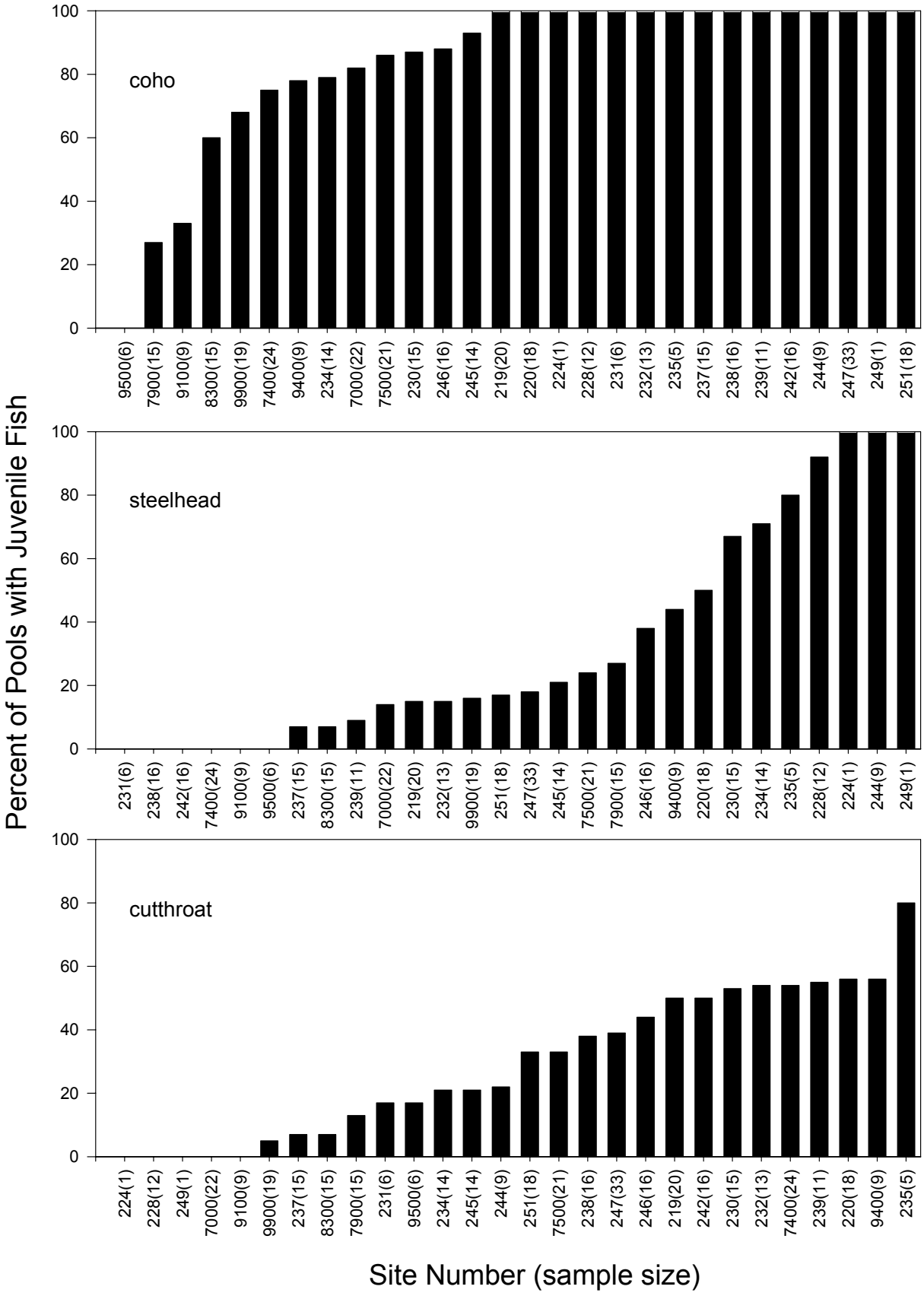

Figure 51. Percent of pools at each site snorkeled in Smith River tributaries that contained at least one juvenile salmonid in the summer of 2003.

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Appendix 1. 1. Location, sample sizes, average density, and percentage of pools containing juvenile salmonids at coastal Monitoring Area sites sampled in 2003. Bolded sites are 4th-5th order streams. Abbreviations for monitoring areas are: NC= North Coast, MC= Mid Coast, MS=Mid-South Coast, UMP=Umpqua, and SC=South Coast. Abbreviations for fish species are: Sthd= Steelhead, and Cutt=Cutthroat.

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
NC	12	Trask River, South Fork	Boundary Cr.	-123.5445	45.3536	18	0.14	25	84	80	96
NC	212	Neskowin Creek, Main Stem	Hawk Cr.	-123.967	45.1032	7	0.15	9	44	67	56
NC	671	Tillamook River, Main Stem	Beaver Cr.	-123.8653	45.4094	0	-	20	50	-	-
NC	708	Tillamook River, Main Stem	Joe Cr.	-123.8271	45.3758	0	-	26	0	-	-
NC	714	Tillamook River, Main Stem	Tillamook R.	-123.8309	45.3520	0	-	8	38	-	-
NC	823	Tillamook River, Main Stem	Killam Cr.	-123.797	45.3966	10	0.17	14	50	21	50
NC	897	Nestucca River, Beaver Creek	Bear Cr.	-123.8332	45.3135	20	0.05	21	43	86	62
NC	949	Neskowin Creek, Main Stem	Sloan Cr.	-123.9092	45.0700	2	0.00	2	0	50	0
NC	1014	Nehalem River, Rock Creek	Rock Cr, S. Fk.	-123.4574	45.7938	32	1.19	33	100	24	18
NC	1066	Nehalem River, North Fork	Lost Cr.	-123.7183	45.7829	8	0.00	12	0	17	17
NC	1088	Nehalem River, Main Stem	Helloff Cr.	-123.7229	45.7399	18	0.00	22	0	55	82
NC	1154	Nehalem River, Main Stem	Cook Cr.	-123.634	45.6906	30	0.00	30	3	67	30
NC	1248	Nehalem River, Rock Creek	Rock Cr, S. Fk.	-123.4338	45.7717	3	2.30	3	100	0	67
NC	1262	Nehalem River, Main Stem	Nehalem R.	-123.3968	45.7183	18	1.04	21	57	43	33
NC	1362	Nehalem River, Salmonberry R.	Salmonberry R.	-123.4801	45.7068	21	0.00	21	0	95	76
NC	1501	Rover Creek, Main Stem	Necanicum R.	-123.8824	45.9120	7	0.17	10	100	60	80
NC	1625	Nehalem River, North Fork	Nehalem R, N. Fk.	-123.7353	45.8100	11	0.00	11	0	18	9
NC	1817	Kilchis River, Main Stem	Sharp Cr.	-123.8035	45.5581	18	0.00	18	0	0	56
NC	1945	Tillamook Bay, Main Stem & Bay	Vaughn Cr.	-123.854	45.5140	8	0.35	8	50	0	88
NC	1965	Miami River, Main Stem	Moss Cr.	-123.8425	45.5642	22	0.53	22	73	55	68
NC	2019	Nehalem River, Main Stem	Roy Cr.	-123.8346	45.7086	14	0.03	22	41	86	59
NC	2050	Nehalem River, Main Stem	Foley Cr.	-123.8384	45.6699	14	0.18	25	72	72	72
NC	2130	Nehalem River, Main Stem	Walker Creek.	-123.4578	45.91138	0	-	23	100	-	-
NC	2177	Nehalem River, Main Stem	Fishhawk Cr.	-123.507	45.9322	10	0.01	10	60	10	10
NC	2265	Nehalem River, Main Stem	Hamilton Cr.	-123.5621	45.9724	22	0.80	22	100	0	68
NC	2398	Nehalem River, Main Stem	Clear Cr, Lower N. Fk.	-123.3092	45.81843	0	-	6	100	-	-
NC	2502	Nehalem River, Main Stem	Calvin Cr.	-123.2936	45.9980	0	-	10	100	-	-
NC	2581	Nehalem River, Main Stem	Cedar Cr.	-123.1432	45.9657	10	0.67	11	73	9	18
NC	2626	Nehalem River, Main Stem	Deep Cr.	-123.3071	45.9301	0	-	25	84	-	-
NC	2669	Nehalem River, Rock Creek	Rock Cr.	-123.2644	45.8820	8	0.08	10	90	10	10

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
NC	2717	Nehalem River, Main Stem	Dog Cr.	-123.1055	45.8794	19	1.02	22	100	9	23
NC	2764	Nehalem River, Main Stem	Nehalem R, E. Fk.	-123.0657	45.8378	2	0.32	4	100	0	0
NC	2939	Wilson River, Main Stem	Ben Smith Cr.	-123.5158	45.5858	24	0.99	24	100	67	38
NC	3076	Wilson River, Main Stem	Jordan Cr.	-123.49	45.5527	18	0.00	18	0	11	61
NC	3079	Wilson River, Main Stem	Jordan Cr.	-123.4967	45.5492	32	0.00	32	6	25	84
NC	3183	Nehalem River, Main Stem	Nehalem R.	-123.2846	45.7367	24	0.52	27	96	30	30
NC	**11010**	Nehalem River, Mainstem	Nehalem River	-123.7620	45.5587	9	0.00	9	44	89	78
NC	**11020**	Trask River, Mainstem	Trask River	-123.7092	45.8001	7	0.00	7	0	0	29
NC	**11030**	Nehalem River, Mainstem	Nehalem River	-123.9686	45.8454	6	0.03	6	100	50	50
NC	**11040**	Nestucca River, Mainstem	Nestucca River	-123.8934	45.4838	3	0.02	3	100	100	100
NC	**11050**	Nehalem River, Mainstem	Nehalem River	-123.9044	45.7624	10	0.22	10	100	40	60
NC	**11060**	Nestucca River, Mainstem	Nestucca River	-123.8854	45.7075	3	0.00	3	0	0	33
NC	**11070**	Trask River, Mainstem	Trask River	-123.6482	45.9893	2	0.00	2	50	0	0
NC	**11090**	Nehalem River, Mainstem	Nehalem River	-123.6764	45.5687	8	0.04	8	63	88	88
NC	**11100**	Nehalem River, Mainstem	Nehalem River	-123.5371	45.8169	4	0.00	4	0	0	0
MC	79	Alsea River, Main Stem & Bay	Cow Cr.	-123.762	44.3737	18	0.53	18	94	56	61
MC	81	Alsea River, Five Rivers	Little Lobster Cr.	-123.7092	44.3085	38	0.11	39	95	13	33
MC	110	Tenmile Creek, Main Stem	Wildcat Cr.	-123.9686	44.2229	45	0.16	45	78	80	51
MC	176	Alsea River, Five Rivers	Buck Cr.	-123.8934	44.2587	33	0.98	33	100	85	39
MC	201	Siuslaw River, Lake Creek	Indian Cr, W. Fk.	-123.9044	44.2009	19	0.51	19	100	89	21
MC	220	Siuslaw River, Lake Creek	Rogers Cr.	-123.8854	44.1593	35	0.38	35	97	51	46
MC	291	Alsea River, Five Rivers	Lobster Cr.	-123.6482	44.2620	40	0.56	40	100	55	43
MC	315	Siuslaw River, Lake Creek	Bear Cr.	-123.6764	44.1609	22	0.50	22	100	55	36
MC	411	Alsea River, North Fork	Crooked Cr.	-123.5371	44.4256	29	0.14	29	83	52	28
MC	414	Alsea River, Main Stem & Bay	Mill Cr.	-123.623	44.3898	36	0.02	36	39	64	28
MC	490	Siuslaw River, Wolf Creek	Wolf Cr.	-123.4282	43.9251	26	0.10	26	88	12	35
MC	530	Siuslaw River, Main Stem	Doe Cr.	-123.3631	43.8762	21	0.36	23	100	0	17
MC	609	Siuslaw River, Main Stem	Clay Cr.	-123.5659	43.9041	18	0.75	18	94	17	11
MC	616	Siuslaw River, Main Stem	Siuslaw R.	-123.5978	43.9034	4	0.00	4	0	0	25
MC	691	Siuslaw River, Main Stem	Hawley Cr.	-123.2078	43.8509	25	0.01	25	32	0	0
MC	729	Cape Creek, Main Stem	Wapiti Cr.	-124.0787	44.1275	36	0.18	36	69	81	64
MC	752	Siuslaw River, North Fork	Porter Cr.	-123.9399	44.1360	31	0.27	31	100	32	65
MC	821	Rock Creek, Main Stem	Rock Cr.	-124.0534	44.1878	26	0.07	26	46	54	62
MC	826	Tenmile Creek, Main Stem	Mill Cr.	-124.0691	44.2078	16	0.00	16	0	31	38
MC	881	Siuslaw River, Main Stem	Hadsall Cr, Trib. D	-123.847	43.9955	26	0.32	26	100	38	31

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
MC	939	Siuslaw River, Main Stem	Beech Cr.	-123.6976	44.0598	5	0.00	5	0	0	20
MC	1008	Yaquina River, Main Stem & Bay	Randall Cr.	-123.6574	44.6720	2	0.58	2	100	0	50
MC	1026	Yaquina River, Elk Creek	Spout Cr.	-123.6859	44.5520	34	0.31	34	100	18	21
MC	1076	Yaquina River, Little Elk Creek	Oglesby Cr.	-123.7259	44.6381	8	0.57	8	63	75	50
MC	1077	Siletz River, Rock Creek	Brush Cr.	-123.6704	44.6823	8	0.00	8	0	13	0
MC	1247	Siletz River, Main Stem	Mill Cr, N. Fk.	-123.7582	44.7663	29	0.63	29	100	69	38
MC	1266	Yaquina River, Main Stem & Bay	Drake Cr	-123.9622	44.6884	0	-	24	63	-	-
MC	1332	Yaquina River, Main Stem & Bay	W Olalla Cr, Trib. A	-123.9236	44.6626	9	0.04	9	11	0	0
MC	1344	Yaquina River, Main Stem & Bay	Thornton Cr.	-123.8252	44.6777	32	0.25	32	91	6	6
MC	1394	Siletz River, Main Stem	Bear Cr.	-123.9209	44.8710	34	0.26	34	85	76	56
MC	1463	Cummins Cr, Main Stem	Cummins Cr.	-124.0623	44.2671	41	0.14	41	68	83	61
MC	1537	Beaver Creek, Mainstem	Elkhorn Cr.	-123.9798	44.4997	43	1.09	43	100	65	88
MC	1563	Yaquina River, Elk Creek	Beaver Cr.	-123.8217	44.5812	15	0.28	15	100	13	27
MC	1587	Alsea River, Main Stem & Bay	Hatchery Cr.	-123.8758	44.4049	16	0.02	16	13	25	38
MC	1652	Alsea River, Main Stem & Bay	Lake Cr.	-123.88	44.3372	1	0.00	1	0	100	100
MC	1770	Siuslaw River, Wolf Creek	Wolf Cr.	-123.5279	43.9578	17	0.01	17	53	0	12
MC	1783	Siuslaw River, Main Stem	Fryingpan Cr.	-123.4447	43.8434	6	0.06	6	33	17	50
MC	1864	Siuslaw River, North Fork	Morris Cr.	-124.0287	44.0425	53	0.19	53	92	40	25
MC	1876	Big Creek, Main Stem & S. Fk.	Big Cr.	-124.1058	44.1707	40	0.05	40	68	45	33
MC	1893	Siuslaw River, Lake Creek	Indian Cr.	-123.8046	44.0974	12	0.00	12	17	0	8
MC	1967	Yaquina River, Main Stem & Bay	Thornton Cr.	-123.825	44.6866	25	1.00	25	96	20	28
MC	**12010**	Yaquina River, Mainstem	Elk Creek.	-123.9811	44.5551	6	0.01	6	100	0	33
MC	**12020**	Alsea River, Mainstem	Alsea River	-124.0770	44.3729	7	0.00	7	14	57	43
MC	**12040**	Siuslaw River, Mainstem	Siuslaw River	-123.8746	44.0208	4	0.00	4	0	0	0
MC	**12050**	Siletz River, Mainstem	Siletz River	-123.8443	44.7590	5	0.00	5	20	80	40
MC	**12060**	Siuslaw River, Mainstem	Lake Creek	-124.0008	44.0834	13	0.00	13	0	8	8
MC	**12070**	Yaquina River, Mainstem	Elk Creek	-124.1418	44.5522	12	0.00	12	17	0	8
MC	**12080**	Siuslaw River, Mainstem	Wolf Creek	-124.1833	43.9518	15	0.00	15	33	0	7
MC	**12090**	Siletz River, Mainstem	Siletz River	-123.6707	44.7889	9	0.01	9	56	89	100
MC	**12100**	Alsea River, Mainstem	Alsea River	-123.7365	44.3769	12	0.00	12	42	33	58
MC	**12110**	Yaquina River, Mainstem	Elk Creek	-123.7662	44.5584	17	0.02	17	88	0	29
MC	**12120**	Siuslaw River, Mainstem	Wolf Creek	-124.3833	43.9423	12	0.06	12	100	8	75
MC	**12140**	Siuslaw River, Mainstem	Siuslaw River	-124.3934	44.0481	11	0.00	11	0	0	18
MS	99	Coos River, South Fork	Tioga Cr.	-123.805	43.2899	24	0.72	24	100	8	25
MS	326	Fourmile Cr, Main Stem	Fourmile Cr.	-124.3316	42.9869	4	2.81	10	100	90	0

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
MS	433	Coquille River, Middle Fork	Sandy Cr.	-123.8686	43.0237	16	0.50	16	100	13	44
MS	489	Coquille River, North Fork	Park Cr.	-123.8667	43.2510	7	0.15	7	43	43	57
MS	600	Coquille River, East Fork	Elk Cr.	-123.9726	43.1204	21	0.71	21	100	33	57
MS	606	Coquille River, East Fork	Steel Cr.	-123.9605	43.1621	19	0.94	22	100	5	9
MS	689	Coquille River, North Fork	Johns Cr.	-124.0599	43.0782	8	1.88	8	100	13	100
MS	705	Coquille River, Middle Fork	Rock Cr.	-123.9239	42.9266	40	0.00	40	10	75	63
MS	858	Sixes River, Main Stem	Sixes R.	-124.3052	42.8041	6	0.00	9	0	89	44
MS	1025	Coos River, Millicoma River	Elk Cr.	-123.936	43.5649	33	1.05	33	100	39	45
MS	1149	Tenmile Creek, S. Tenmile Lake	Johnson Cr.	-124.0405	43.5269	3	1.73	4	100	25	0
MS	1199	Coos River, South Fork	Rogers Cr.	-124.05	43.3686	1	3.43	1	100	0	100
MS	1232	Coos River, South Fork	Mink Cr.	-123.8544	43.3022	9	0.00	9	0	0	100
MS	1287	Coquille River, North Fork	Moon Cr, Trib. A	-123.9811	43.2901	20	0.32	20	60	75	70
MS	1319	Coos River, South Fork	Wren Smith Cr.	-124.077	43.3212	17	0.86	17	88	12	53
MS	1385	Coos River, Millicoma River	Millicoma R, E. Fk.	-123.8746	43.4195	25	1.40	25	100	64	44
MS	1388	Coos River, Millicoma River	Millicoma R, E. Fk.	-123.8443	43.4249	47	1.35	48	100	46	27
MS	1442	Coos River, Millicoma River	Woodruff Cr.	-124.0008	43.4252	19	1.54	19	100	37	58
MS	1531	Coquille River, Main Stem & Bay	Cunningham Cr.	-124.1418	43.2187	0	-	30	100	-	-
MS	1757	Tahkenitch Creek, Fivemile Cr.	Fivemile Cr.	-124.0246	43.8398	0	-	32	100	-	-
MS	1905	Coos River, South Fork	Williams R.	-123.6707	43.2377	47	2.02	47	100	34	34
MS	1907	Coos River, South Fork	Tioga Cr.	-123.7365	43.1933	7	0.00	7	0	0	0
MS	2058	Coquille River, Middle Fork	M. Fk. Coquille Trib.	-123.7662	42.9654	16	0.10	16	25	19	56
MS	2192	Sixes River, Main Stem	Sixes R.	-124.3833	42.8075	8	0.00	8	0	63	38
MS	2220	Sixes River, Main Stem	Dry Cr.	-124.3934	42.7717	14	0.00	14	0	0	0
MS	2322	Tenmile Creek, Eel Lake	Eel Cr.	-124.1833	43.5888	0	-	37	5	-	-
MS	2438	Coos River, Millicoma River	Packard Cr.	-124.0236	43.4048	4	1.48	5	60	0	60
MS	**13010**	Coos River, South Fork	Williams River	-123.4157	43.3161	26	0.12	26	92	8	0
MS	**13020**	Coquille River, Mainstem	Middle Fork Coquille R.	-123.3003	43.0238	4	0.00	4	50	75	50
MS	**13030**	Coquille River, Mainstem	East Fork Coquille R.	-122.5452	43.1564	30	0.07	30	87	80	50
MS	**13040**	Coquille River, Mainstem	South Fork Coquille R.	-122.6907	42.7836	14	0.00	14	43	93	71
MS	**13050**	Coquille River, Mainstem	Middle Fork Coquille R.	-123.2627	43.0191	14	0.00	14	21	36	29
MS	**13060**	Coquille River, Mainstem	South Fork Coquille R.	-123.1686	42.9784	4	0.00	4	25	75	25
MS	**13070**	Coquille River, Mainstem	North Fork Coquille R.	-122.6829	43.1554	3	0.01	3	100	0	0
MS	**13080**	Coos River, Mainstem	South Fork Coos River	-122.6420	43.3680	21	0.00	21	5	0	0
MS	**13090**	Coquille River, Mainstem	Middle Fork Coquille R.	-122.5773	42.9937	12	0.00	12	0	42	25
MS	**13100**	Coquille River, Mainstem	South Fork Coquille R.	-122.7546	43.0303	4	0.00	4	0	25	0

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
MS	**13110**	Coquille River, Mainstem	East Fork Coquille R.	-122.5363	43.1306	11	0.01	11	64	0	36
MS	**13120**	Coos River, Mainstem	South Fork Coos River	-122.8355	43.3519	6	0.01	6	100	0	50
UMP	229	Umpqua River, Main Stem & Bay	Cougar Cr.	-123.6163	43.3651	3	0.04	4	25	50	25
UMP	274	Umpqua River, Main Stem & Bay	Lost Cr.	-123.5213	43.4595	24	0.49	24	88	8	38
UMP	692	Umpqua River, South Umpqua	Iron Mtn Cr.	-123.5257	42.9084	25	0.50	25	88	4	0
UMP	705	Umpqua River, South Umpqua	Middle Cr, S. Fk.	-123.4319	42.8442	20	0.08	20	55	0	0
UMP	721	Umpqua River, South Umpqua	Martin Cr.	-123.4748	42.8111	6	0.00	6	0	0	83
UMP	762	Umpqua River, South Umpqua	N Myrtle Cr.	-123.2572	43.0423	16	0.15	16	88	31	13
UMP	818	Umpqua River, South Umpqua	Wood Cr.	-123.1491	42.9914	31	0.00	32	0	0	6
UMP	854	Umpqua River, South Umpqua	Canyon Cr.	-123.2773	42.9356	22	0.04	22	55	0	5
UMP	865	Umpqua River, South Umpqua	Canyon Cr, W F Trib. A	-123.2759	42.8858	11	1.05	11	100	0	27
UMP	884	Umpqua River, South Umpqua	O'Shea Cr.	-123.2368	42.9154	13	1.78	13	100	23	0
UMP	915	Umpqua River, South Umpqua	Wood Cr.	-123.3956	42.7817	22	1.10	22	100	18	41
UMP	918	Umpqua River, South Umpqua	Windy Cr.	-123.3808	42.7726	32	0.14	35	94	0	23
UMP	958	Umpqua River, South Umpqua	Clear Cr.	-123.2445	42.7957	0	-	8	100	-	-
UMP	972	Umpqua River, South Umpqua	Bull Run Cr.	-123.2451	42.7568	1	4.27	2	100	0	0
UMP	1034	Umpqua River, Main Stem & Bay	Dry Cr.	-124.0575	43.6437	1	0.00	1	0	0	100
UMP	1113	Umpqua River, Main Stem & Bay	Wolf Cr.	-123.6095	43.4565	29	0.57	29	100	10	31
UMP	1151	Umpqua River, Main Stem & Bay	Lutsinger Cr.	-123.7177	43.6325	22	0.51	26	100	4	58
UMP	1473	Umpqua River, Elk Creek	Parker Cr.	-123.4319	43.6675	29	0.38	30	97	17	27
UMP	1512	Umpqua River, Smith River	Panther Cr.	-123.4891	43.8076	17	0.63	17	100	0	29
UMP	1528	Umpqua River, Main Stem & Bay	Little Paradise Cr.	-123.6151	43.6693	16	0.32	16	94	0	6
UMP	1659	Umpqua River, Smith River	Panther Cr.	-123.4719	43.8246	13	0.45	13	92	0	23
UMP	2005	Umpqua River, Calapooya Creek	Oldham Cr.	-123.1507	43.4662	0	-	20	0	-	-
UMP	2078	Umpqua River, Calapooya Creek	Gassy Cr.	-123.1013	43.3756	5	0.00	5	0	0	0
UMP	2159	Umpqua River, Calapooya Creek	Oldham Cr.	-123.1981	43.4627	0	-	21	0	-	-
UMP	2195	Umpqua River, Main Stem & Bay	Yellow Cr.	-123.4157	43.5153	39	0.71	39	97	5	3
UMP	2214	Umpqua River, North Umpqua	Sutherlin Cr.	-123.3003	43.3889	0	-	13	8	-	-
UMP	2309	Umpqua River, South Umpqua	Falcon Cr.	-122.5452	42.9935	15	0.00	15	0	93	0
UMP	2414	Umpqua River, South Umpqua	Black Canyon Cr.	-122.6907	42.9453	22	0.00	22	0	55	0
UMP	**14020**	Umpqua River, South Fork	Cow Creek	-123.5210	42.7415	8	0.00	8	88	0	13
UMP	**14030**	Umpqua River, North Fork	Steamboat Creek	-123.5320	43.3505	12	0.00	12	0	67	67
UMP	**14040**	Umpqua River, Camp Creek	Mill Creek	-123.3587	43.6381	14	0.00	14	0	14	14
UMP	**14050**	Umpqua River, South Fork	Jackson Creek	-123.5525	42.9693	16	0.08	16	94	94	69
UMP	**14070**	Umpqua River, Mainstem	South Umpqua River	-123.5825	42.9788	7	0.01	7	43	71	57

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
UMP	**14080**	Umpqua River, Mainstem	Elk Creek	-123.4996	43.6618	11	0.00	11	0	0	0
UMP	**14100**	Umpqua River, North Fork	South Umpqua River	-123.4473	43.3861	12	0.29	12	100	75	67
UMP	**14110**	Umpqua River, Mainstem	South Umpqua River	-123.5666	42.9571	8	0.00	8	0	0	0
UMP	**14130**	Umpqua River, North Fork	Little River	-122.8745	43.2340	15	0.11	15	80	60	47
UMP	**14150**	Umpqua River, South Fork	Cow Creek	-123.6180	42.8415	9	0.00	9	0	33	0
UMP	**14240**	Umpqua River, Mainstem	Smith River	-123.5442	43.7748	12	0.01	12	58	0	25
SC	13	Rogue River, Main Stem	Grave Cr.	-123.2627	42.6392	4	1.53	4	100	75	0
SC	36	Rogue River, Main Stem	Grave Cr.	-123.1686	42.6994	19	0.00	20	0	35	0
SC	53	Rogue River, Main Stem	Sugarpine Cr.	-122.6829	42.8295	7	1.35	7	100	43	14
SC	60	Rogue River, Main Stem	Elk Cr.	-122.642	42.7893	18	1.13	18	100	61	33
SC	92	Rogue River, Big Butte Creek	Big Butte Cr, S. Fk.	-122.5773	42.5582	6	0.28	10	50	50	0
SC	116	Rogue River, Main Stem	Reese Cr, S. Fk.	-122.7546	42.5392	13	0.70	15	93	13	0
SC	122	Rogue River, Big Butte Creek	Big Butte Cr, N. Fk.	-122.5363	42.5529	17	0.80	21	95	52	29
SC	138	Rogue River, Main Stem	Little Butte Cr.	-122.697	42.4641	0	-	9	22	-	-
SC	140	Rogue River, Main Stem	Trail Cr.	-122.8355	42.7205	22	3.99	23	100	61	0
SC	145	Rogue River, Main Stem	Trail Cr, W. Fk.	-122.8713	42.6917	2	1.21	10	40	0	0
SC	165	Rogue River, Main Stem	Evans Cr.	-122.9841	42.6066	10	0.95	15	60	0	0
SC	210	Rogue River, Main Stem	Evans Cr, W. Fk.	-123.0453	42.6492	21	0.55	21	95	5	0
SC	235	Rogue River, Main Stem	Reese Cr.	-122.8265	42.5331	0	-	11	36	-	-
SC	241	Rogue River, Main Stem	Salt Cr.	-123.0275	42.6801	4	0.00	6	0	100	0
SC	266	Rogue River, Main Stem	Wolf Cr.	-123.4427	42.6841	0	-	2	0	-	-
SC	290	Rogue River, Main Stem	Galice Cr.	-123.6047	42.5647	14	0.59	14	93	36	14
SC	340	Rogue River, Main Stem	Shasta Costa Cr.	-124.0088	42.5828	12	0.10	12	75	83	33
SC	346	Rogue River, Main Stem	Silver Cr.	-124.2337	42.5096	40	0.46	40	88	95	5
SC	367	Rogue River, Lobster Creek	Boulder Cr.	-124.1859	42.6262	45	0.00	45	0	76	9
SC	368	Rogue River, Lobster Creek	Lobster Cr, S. Fk.	-124.1725	42.6091	19	0.11	19	95	79	42
SC	374	Rogue River, Lobster Creek	Lobster Cr, N. Fk.	-124.2112	42.6508	16	0.00	16	0	94	75
SC	397	Rogue River, Lobster Creek	Lobster Cr.	-124.2955	42.5175	11	0.00	11	18	73	36
SC	415	Rogue River, Lobster Creek	Lobster Cr, N. Fk	.-124.2422	42.6340	14	0.00	14	0	100	86
SC	468	Rogue River, Illinois River	Rough And Ready Cr.	-123.7166	42.0935	8	0.00	8	0	25	13
SC	493	Rogue River, Applegate River	Williams Cr, W Fk, R Fk	-123.3537	42.1625	15	0.00	15	0	53	0
SC	500	Not Identified, Not Identified	N Fk Dunn Cr.	-123.5587	42.0030	4	0.00	4	0	0	0
SC	576	Rogue River, Illinois River	Illinois R, W .Fk.	-123.7649	42.0188	17	0.47	17	100	24	0
SC	582	Rogue River, Illinois River	Illinois R, W. Fk.	-123.7514	42.0335	7	0.22	7	86	0	0
SC	609	Rogue River, Main Stem	Little Butte Cr, S. Fk.	-122.5582	42.3709	13	3.65	14	100	93	21

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
SC	628	Rogue River, Main Stem	Little Butte Cr, S. Fk.	-122.5168	42.3560	17	2.30	22	100	91	0
SC	629	Rogue River, Main Stem	Soda Cr.	-122.5085	42.3526	19	1.74	19	68	63	0
SC	636	Rogue River, Main Stem	Lake Cr.	-122.6244	42.4103	6	1.43	7	100	0	0
SC	678	Rogue River, Main Stem	Pleasant Cr, Queens Br	-123.1764	42.5406	1	0.09	1	100	0	0
SC	681	Rogue River, Main Stem	Pleasant Cr.	-123.1661	42.5437	2	0.00	9	67	0	0
SC	724	Rogue River, Main Stem	Louse Cr.	-123.386	42.5005	2	0.30	2	50	0	0
SC	746	Rogue River, Applegate River	Williams Cr.	-123.2557	42.2577	7	1.60	11	100	55	18
SC	781	Rogue River, Applegate River	Williams Cr, E. Fk.	-123.2606	42.1785	11	2.19	11	100	36	9
SC	800	Rogue River, Illinois River	Deer Cr, N. Fk.	-123.4381	42.2914	3	4.33	3	100	33	0
SC	803	Rogue River, Illinois River	Deer Cr, N. Fk.	-123.4384	42.2871	4	1.11	4	100	25	0
SC	837	Rogue River, Main Stem	Limpy Cr.	-123.521	42.4364	16	1.97	16	100	38	6
SC	845	Rogue River, Main Stem	Shan Cr.	-123.532	42.4638	28	0.00	28	0	25	7
SC	854	Rogue River, Applegate River	Murphy Cr.	-123.3587	42.3146	10	2.39	10	100	30	0
SC	869	Rogue River, Applegate River	Waters Cr.	-123.5525	42.3704	2	1.24	3	100	0	0
SC	879	Rogue River, Applegate River	Butcherknife Cr.	-123.5825	42.3461	6	1.46	6	100	33	0
SC	914	Rogue River, Illinois River	Crooks Cr.	-123.4996	42.3091	11	6.37	12	100	58	0
SC	920	Rogue River, Applegate River	Cheney Cr.	-123.4473	42.3677	3	1.58	3	100	33	0
SC	937	Rogue River, Illinois River	Deer Cr.	-123.5666	42.2728	1	2.78	1	100	0	0

Appendix 1. 2. Location, sample sizes, average density, and percentage of pools containing juvenile salmonids at coastal Monitoring Area sites sampled in 2003. Bolded sites are 4th-5th order streams. Abbreviations for monitoring areas are: NC= North Coast, MC= Mid Coast, MS=Mid-South Coast, UMP=Umpqua, and SC=South Coast. Abbreviations for fish species are: Sthd= Steelhead, and Cutt=Cutthroat.

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
NC	12	Trask River, South Fork	Boundary Cr	-123.5445	45.3536	31	0.49	31	97	90	42
NC	75	Nestucca River, Main Stem & Bay	Elk Cr, Trib A	-123.5353	45.2951	1	0.00	4	0	0	75
NC	120	Nestucca River, Main Stem & Bay	Elk Cr	-123.5571	45.3237	40	0.00	40	0	0	40
NC	181	Sand Lake, Main Stem	Beltz Cr	-123.9556	45.2573	2	0.00	4	0	25	25
NC	576	Trask River, Main Stem	Rawe Cr	-123.6337	45.4427	19	0.00	21	0	76	100
NC	714	Tillamook River, Main Stem	Tillamook R	-123.8309	45.3520	0	-	11	82	-	-
NC	780	Trask River, South Fork	E Fk Of S Fk Trask R	-123.5905	45.3900	9	0.26	9	100	100	44
NC	949	Neskowin Creek, Main Stem	Sloan Cr	-123.9092	45.0700	5	0.53	5	80	40	60
NC	1091	Nehalem River, Main Stem	Snark Cr	-123.6777	45.7504	4	0.00	4	0	50	50
NC	1311	Nehalem River, Salmonberry River	Wolf Cr	-123.4461	45.6946	19	0.00	19	0	84	95
NC	1378	Necanicum River, South Fork	Necanicum R, S Fk	-123.8468	45.8974	12	0.40	20	100	40	30
NC	1417	Rover Creek, Main Stem	Charlie Cr	-123.7645	45.9110	1	0.56	31	84	10	16
NC	1481	Rover Creek, Main Stem	Little Muddy Cr	-123.9436	45.9675	1	0.00	4	0	0	100
NC	1645	Nehalem River, North Fork	Nehalem R, N Fk, Trib	-123.6759	45.8277	12	0.00	22	5	77	41
NC	1711	Nehalem River, North Fork	Nehalem R, N Fk	-123.7618	45.8072	12	0.05	12	75	8	25
NC	1742	Nehalem River, Main Stem	Peterson Cr	-123.8031	45.7019	16	0.00	16	0	75	56
NC	1786	Wilson River, Little North Fork	Wilson R, N Fk, Little	-123.7309	45.4927	14	0.84	14	100	71	86
NC	1868	Kilchis River, Main Stem	Kilchis R	-123.7952	45.5855	12	0.25	12	100	67	33
NC	2050	Nehalem River, Main Stem	Foley Cr	-123.8384	45.6699	12	0.07	16	63	81	94
NC	2096	Nehalem River, Main Stem	E Humbug Cr	-123.6129	45.9161	3	1.08	31	97	16	23
NC	2154	Nehalem River, Main Stem	Gilmore Cr	-123.5329	45.9601	0	-	10	70	30	30
NC	2207	Nehalem River, Main Stem	Walker Cr	-123.4729	46.0193	10	0.46	33	94	45	33
NC	2254	Nehalem River, Main Stem	Beneke Cr	-123.5119	45.9958	11	1.83	26	100	50	35
NC	2265	Nehalem River, Main Stem	Hamilton Cr	-123.5621	45.9724	18	0.64	22	95	41	41
NC	2343	Nehalem River, Main Stem	Deep Cr	-123.3398	45.9091	0	-	19	100	0	5
NC	2415	Nehalem River, Rock Creek	Rock Cr	-123.3534	45.8483	8	0.69	16	100	75	38
NC	2467	Nehalem River, Main Stem	Beaver Cr	-123.3225	46.0207	0	-	30	93	0	27
NC	2532	Nehalem River, Main Stem	Pebble Cr	-123.1775	45.8439	0	-	21	100	5	0

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
NC	2657	Nehalem River, Rock Creek	Rock Cr	-123.2446	45.8799	1	0.02	11	91	36	55
NC	2678	Nehalem River, Rock Creek	Rock Cr	-123.2959	45.8822	0	-	11	100	64	82
NC	2720	Nehalem River, Main Stem	Oak Ranch Cr	-123.0737	45.9328	0	-	29	90	34	17
NC	2875	Trask River, North Fork	Cruiser Cr	-123.4762	45.4200	11	1.44	12	83	25	17
NC	2939	Wilson River, Main Stem	Ben Smith Cr	-123.5158	45.5858	15	1.48	18	100	78	56
NC	2943	Wilson River, Main Stem	Ben Smith Cr	-123.51	45.5807	15	1.31	24	79	63	42
NC	3064	Trask River, North Fork	Clear Cr, #2	-123.4868	45.4743	19	0.14	21	86	90	86
NC	3079	Wilson River, Main Stem	Jordan Cr	-123.4967	45.5492	43	0.16	44	43	57	2
NC	**11120**	Trask River, Mainstem	Trask River	-123.7707	45.4390	6	0.05	6	100	50	83
NC	**11130**	Nehalem River, Mainstem	Nehalem River	-123.1800	45.9653	3	0.00	3	0	33	33
NC	**11150**	Nehalem River, Mainstem	Nehalem River	-123.7643	45.7311	1	0.00	1	0	100	100
NC	**11160**	Nestucca River, Mainstem	Nestucca River	-123.6065	45.2394	19	0.63	19	100	89	89
NC	**11170**	Trask River, Mainstem	Trask River	-123.5774	45.7287	6	0.01	6	100	100	100
NC	**11180**	Nehalem River, Mainstem	Salmonberry River	-123.1430	45.9042	11	0.00	11	27	100	100
NC	**11190**	Nehalem River, Mainstem	Nehalem River	-123.6418	45.4562	3	0.00	3	0	0	0
NC	**11200**	Trask River, Mainstem	Trask River	-123.6418	45.4562	7	0.00	7	0	100	100
NC	**11210**	Nehalem River, Mainstem	Nehalem River	-123.3455	45.9786	3	0.00	4	75	0	50
MC	35	Siuslaw River, Lake Creek	Fawn Cr	-123.7012	44.2115	36	0.45	36	100	39	22
MC	129	Yachats River, Main Stem	Stump Cr, Trib A	-123.9705	44.2611	7	0.17	7	57	100	14
MC	187	Siuslaw River, North Fork	Elma Cr	-123.9372	44.1753	13	1.69	13	100	0	0
MC	213	Siuslaw River, Lake Creek	Indian Cr	-123.8403	44.1727	22	0.06	22	68	5	5
MC	220	Siuslaw River, Lake Creek	Rogers Cr	-123.8854	44.1593	35	0.56	35	100	40	69
MC	295	Siuslaw River, Lake Creek	Buck Cr	-123.687	44.1971	12	0.84	12	100	58	33
MC	411	Alsea River, North Fork	Crooked Cr	-123.5371	44.4256	30	0.45	30	100	50	43
MC	520	Siuslaw River, Main Stem	Jeans Cr	-123.4551	43.8656	10	0.17	10	60	10	20
MC	547	Siuslaw River, Main Stem	Bear Cr	-123.5108	43.8558	13	0.10	13	31	15	0
MC	575	Siuslaw River, Main Stem	Wildcat Cr	-123.4843	44.0046	20	0.06	23	74	4	13
MC	609	Siuslaw River, Main Stem	Clay Cr	-123.5659	43.9041	14	0.55	14	100	79	36
MC	671	Siuslaw River, Main Stem	Siuslaw R	-123.3187	43.8215	0	-	13	0	0	15
MC	748	Siuslaw River, North Fork	Condon Cr	-123.9838	44.0859	30	0.71	30	100	73	40
MC	798	Big Creek, Main Stem & Sfk	Big Cr	-124.098	44.1704	38	0.36	39	95	67	33
MC	826	Tenmile Creek, Main Stem	Mill Cr	-124.0691	44.2078	13	0.00	13	0	69	38
MC	832	Siuslaw River, Lake Creek	Indian Cr, W Fk	-123.8702	44.1520	14	0.10	14	100	14	14
MC	850	Siuslaw River, Main Stem	Thompson Cr	-123.8753	44.0883	28	0.14	28	79	32	64

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
MC	935	Siuslaw River, Lake Creek	Chappell Cr	-123.6952	44.1133	17	0.80	19	89	0	79
MC	1026	Yaquina River, Elk Creek	Spout Cr	-123.6859	44.5520	28	0.15	28	100	0	11
MC	1044	Yaquina River, Elk Creek	Wolf Cr	-123.702	44.5801	7	1.03	7	100	43	43
MC	1076	Yaquina River, Little Elk Creek	Oglesby Cr	-123.7259	44.6381	11	0.84	11	45	36	18
MC	1196	Siletz River, Drift Creek	Smith Cr	-123.8292	44.9172	44	0.00	44	0	75	64
MC	1247	Siletz River, Main Stem	Mill Cr, N Fk	-123.7582	44.7663	25	0.83	25	100	48	28
MC	1263	Yaquina River, Main Stem & Bay	Drake Cr	-123.9658	44.6936	0	-	27	0	-	-
MC	1386	Salmon River, Main Stem & Bay	Crowley Cr	-123.9848	45.0484	15	0.00	15	0	60	67
MC	1440	Salmon River, Main Stem & Bay	Salmon R	-123.7514	45.0479	56	0.42	56	96	43	29
MC	1463	Cummins Cr, Main Stem	Cummins Cr	-124.0623	44.2671	32	0.27	32	88	75	50
MC	1468	Cummins Cr, Main Stem	Cummins Cr	-124.0979	44.2673	34	0.08	34	76	88	59
MC	1487	Big Creek, Mainstem, S Fk	Big Cr, S Fk	-124.0857	44.3568	31	0.06	32	63	3	9
MC	1567	Yaquina River, Elk Creek	Bear Cr	-123.8332	44.5923	30	0.12	30	93	7	10
MC	1612	Yaquina River, Main Stem & Bay	Babcock Cr	-123.9267	44.5926	11	0.14	12	67	0	25
MC	1690	Siuslaw River, Lake Creek	Swamp Cr	-123.5794	44.2074	27	0.09	28	64	18	32
MC	1769	Siuslaw River, Wolf Creek	Wolf Cr	-123.5257	43.9401	5	0.01	11	27	0	18
MC	1834	Siuslaw River, Main Stem	Little Siuslaw Cr	-123.3401	43.8068	8	0.31	9	89	0	33
MC	1876	Big Creek, Main Stem & S Fk	Big Cr	-124.1058	44.1707	34	0.10	38	55	34	11
MC	1879	Siuslaw River, Lake Creek	Indian Cr	-123.8404	44.1245	15	0.00	15	7	0	7
MC	1983	Siletz River, Drift Creek	Drift Cr	-123.9536	44.8925	26	0.03	26	54	58	15
MC	2006	Yachats River, North Fork	Yachats R, N Fk	-123.9768	44.3351	34	0.65	34	100	62	65
MC	2054	Beaver Creek, Mainstem	Beaver Cr	-124.016	44.5084	1	0.06	1	100	100	100
MC	**12150**	Alsea River, Mainstem	Alsea River	-123.8575	44.3997	5	0.00	5	20	80	40
MC	**12160**	Siuslaw River, Mainstem	Wolf Creek	-123.6131	43.9610	11	0.00	11	0	0	9
MC	**12180**	Alsea River, Mainstem	Five Rivers	-123.8161	44.3505	7	0.00	7	57	29	29
MC	**12190**	Siletz River, Mainstem	Siletz River	-123.7819	44.8116	2	0.00	2	0	100	50
MC	**12200**	Siuslaw River, Mainstem	Siuslaw River	-123.6620	44.0092	5	0.00	5	0	20	0
MC	**12210**	Siletz River, Mainstem	Siletz River	-123.9359	44.7995	2	0.00	2	100	50	50
MC	**12240**	Siletz River, Mainstem	Siletz River	-123.7998	44.7465	9	0.00	9	67	78	56
MC	**12260**	Siletz River, Mainstem	Siletz River	-123.9171	44.7793	1	0.00	1	100	0	100
MC	**12270**	Alsea River, Mainstem	Alsea River	-123.8430	44.3525	5	0.00	5	20	0	60
MC	**12280**	Siletz River, Mainstem	Siletz River	-123.7334	44.8644	14	0.00	14	7	86	86
MC	**12290**	Siuslaw River, Mainstem	Wolf Creek	-123.4791	43.9372	16	0.00	16	38	0	6
MC	**12330**	Siuslaw River, Mainstem	Siuslaw River	-123.6443	43.9813	5	0.00	5	0	0	0

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
MS	103	Coos River, South Fork	Tioga Cr	-123.8076	43.2695	23	1.07	26	100	15	50
MS	182	Coquille River, South Fork	Ward Cr	-124.2359	43.0427	6	1.03	17	82	0	24
MS	194	Coquille River, Main Stem & Bay	Bear Cr	-124.3069	43.0714	1	1.21	31	97	0	6
MS	227	Coquille River, South Fork	Woodward Cr	-124.064	42.9043	0	-	2	0	0	0
MS	258	Coquille River, South Fork	Wildcat Cr	-124.2101	43.0216	2	7.75	5	100	40	0
MS	427	Coquille River, Middle Fork	Bear Pen Cr	-123.924	43.0622	0	-	1	0	0	0
MS	633	Coquille River, East Fork	Maple Cr	-123.8887	43.1515	1	0.00	2	0	0	0
MS	689	Coquille River, North Fork	Johns Cr	-124.0599	43.0782	7	1.76	7	100	86	29
MS	708	Coquille River, Middle Fork	Belieu Cr	-123.9566	43.0272	24	0.58	37	78	0	46
MS	737	Coquille River, Middle Fork	Rock Cr	-123.9279	42.9493	39	1.39	39	100	26	36
MS	781	Coquille River, South Fork	Salmon Cr	-124.1062	42.8470	16	0.26	19	95	58	68
MS	844	Coquille River, South Fork	Rock Cr	-124.0401	42.7209	51	0.20	52	77	83	33
MS	858	Sixes River, Main Stem	Sixes R	-124.3052	42.8041	7	0.00	8	0	38	0
MS	952	Coos River, Main Stem	Larson Cr	-124.0976	43.4926	19	0.00	21	0	24	43
MS	1157	Coos River, Millicoma River	Cougar Cr, Trib A	-123.8855	43.5797	2	0.00	2	0	0	0
MS	1187	Coos River, Main Stem	Willanch Cr	-124.1538	43.4124	38	1.98	40	100	50	55
MS	1229	Coquille River, North Fork	Honcho Cr	-123.8952	43.2586	14	0.44	14	36	50	43
MS	1247	Coquille River, North Fork	Coquille R, N Fk	-123.8901	43.3085	35	0.71	36	97	78	19
MS	1283	Coquille River, North Fork	Moon Cr, Trib A-1	-123.9757	43.2923	5	0.00	5	0	0	80
MS	1293	Coquille River, North Fork	Coquille R, N Fk	-124.0201	43.2870	0	-	13	100	62	46
MS	1319	Coos River, South Fork	Wren Smith Cr	-124.077	43.3212	28	0.69	31	100	29	23
MS	1385	Coos River, Millicoma River	Millicoma R, E Fk	-123.8746	43.4195	15	0.84	37	100	41	43
MS	1447	Coos River, Millicoma River	Fox Cr	-123.9457	43.4189	7	2.11	9	78	67	22
MS	1666	Coquille River, North Fork	Wood Cr	-124.1164	43.1419	2	1.76	27	41	0	22
MS	1757	Tahkenitch Creek, Fivemile Creek	Fivemile Cr	-124.0246	43.8398	0	-	21	95	-	-
MS	1761	Tahkenitch Creek, Fivemile Creek	Bell Cr	-124.0115	43.8414	0	-	28	96	-	-
MS	1824	Siltcoos River, Fiddle Creek	Bear Cr	-123.9418	43.9156	12	1.85	12	100	17	75
MS	1903	Coos River, South Fork	Williams R	-123.6854	43.2425	36	1.57	36	100	36	44
MS	1905	Coos River, South Fork	Williams R	-123.6707	43.2377	38	2.26	38	100	18	21
MS	2200	Sixes River, Main Stem	Sixes R	-124.3943	42.8072	5	0.00	5	0	20	20
MS	2241	Sixes River, Main Stem	Sixes R	-124.4398	42.8123	9	0.00	9	0	0	0
MS	2322	Ten Mile Creek, Eel Lake	Eel Creek	-124.1833	43.5888	0	-	29	0	-	-
MS	2339	Coos River, Millicoma River	Millicoma R, W Fk	-123.978	43.5159	34	0.45	36	94	17	31
MS	2347	Coos River, Millicoma River	Millicoma R, W Fk	-123.9874	43.5102	30	0.08	30	63	3	0

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MS	2378	Coos River, Main Stem	Lillian Cr	-124.1439	43.3618	0	-	8	13	-	-
MS	2438	Coos River, Millicoma River	Packard Cr	-124.0236	43.4048	0	-	2	100	0	0
MS	**13180**	Coquille River, Mainstem	North Fork Coquille R.	-124.0773	43.0969	1	0.00	1	100	0	0
MS	**13190**	Coquille River, Mainstem	East Fork Coquille R.	-124.0383	43.1113	7	0.02	7	86	71	43
MS	**13200**	Coos River, Mainstem	South Fork Coos River	-123.9539	43.3819	23	0.02	23	96	57	35
MS	**13210**	Coquille River, Mainstem	Middle Fork Coquille R.	-123.8937	43.0043	12	0.01	12	67	17	33
MS	**13230**	Coquille River, Mainstem	South Fork Coquille R.	-124.0769	42.8971	13	0.00	13	0	46	23
MS	**13240**	Coos River, Millicoma River	East Fork Millicoma R.	-123.9780	43.4480	7	0.11	7	100	71	43
MS	**13250**	Coos River, South Fork	Williams River	-123.7680	43.3331	14	0.11	15	80	53	47
MS	**13260**	Coquille River, Mainstem	Middle Fork Coquille R.	-124.0653	43.0383	5	0.00	5	40	40	20
MS	**13270**	Coquille River, Mainstem	East Fork Coquille R.	-123.9662	43.1569	25	0.02	25	48	24	24
UMP	411	Umpqua River, South Umpqua	Bear Cr	-123.554	43.0375	0	-	1	100	-	-
UMP	499	Umpqua River, South Umpqua	Lally Cr	-123.0531	43.0625	21	0.00	22	0	0	5
UMP	503	Umpqua River, South Umpqua	S Myrtle Cr	-123.067	43.0447	21	0.13	24	88	33	29
UMP	550	Umpqua River, South Umpqua	S Myrtle Cr	-123.0337	43.0755	13	0.50	13	100	15	15
UMP	560	Umpqua River, South Umpqua	Brownie Cr	-122.8749	42.8518	24	0.61	24	100	29	4
UMP	605	Umpqua River, South Umpqua	Hatchet Cr	-122.9753	42.9217	21	0.14	21	10	14	14
UMP	617	Umpqua River, South Umpqua	Elk Valley Cr	-123.7086	42.8546	33	0.70	35	94	26	14
UMP	662	Umpqua River, South Umpqua	Bonnie Cr	-123.6075	42.7633	7	0.03	7	29	14	14
UMP	915	Umpqua River, South Umpqua	Wood Cr	-123.3956	42.7817	26	0.55	26	100	38	31
UMP	950	Umpqua River, South Umpqua	Cow Cr, Fortune Br	-123.3149	42.7714	12	0.36	17	53	0	6
UMP	972	Umpqua River, South Umpqua	Bull Run Cr	-123.2451	42.7568	19	0.82	19	95	21	0
UMP	995	Umpqua River, Main Stem & Bay	Charlotte Cr	-123.9243	43.6576	28	1.30	28	100	14	4
UMP	1094	Umpqua River, Main Stem & Bay	Little Wolf Cr	-123.6126	43.4155	21	1.12	21	100	24	62
UMP	1113	Umpqua River, Main Stem & Bay	Wolf Cr	-123.6095	43.4565	29	0.25	29	97	21	24
UMP	1151	Umpqua River, Main Stem & Bay	Lutsinger Cr	-123.7177	43.6325	23	0.49	23	91	57	74
UMP	1156	Umpqua River, Main Stem & Bay	Camp Cr	-123.7628	43.6191	0	-	17	12	-	-
UMP	1200	Umpqua River, Smith River	Railroad Cr	-123.9201	43.7992	8	2.04	8	100	0	13
UMP	1720	Umpqua River, Smith River	Gold Cr	-123.7362	43.8902	26	0.52	27	100	26	85
UMP	1737	Umpqua River, Smith River	Cassady Cr	-123.9897	43.7654	8	0.66	23	39	0	0
UMP	1753	Umpqua River, Smith River	Johnson Cr	-123.9473	43.8308	13	2.00	14	93	14	36
UMP	1761	Umpqua River, North Umpqua	Horse Heaven Cr	-122.594	43.5252	47	0.00	47	0	26	0
UMP	1788	Umpqua River, Calapooya Creek	Gossett Cr	-123.1056	43.4868	8	0.05	9	22	33	33
UMP	1823	Umpqua River, North Umpqua	Rock Cr, NE Fk	-122.8759	43.4639	68	0.00	69	0	65	4

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UMP	1834	Umpqua River, North Umpqua	Rock Cr	-122.9056	43.4237	17	0.02	17	59	65	18
UMP	1855	Umpqua River, North Umpqua	Cedar Cr, N Fk	-122.6601	43.4653	15	0.00	15	0	27	33
UMP	1860	Umpqua River, North Umpqua	Rock Cr	-122.9165	43.4871	51	0.00	51	0	6	18
UMP	1897	Umpqua River, North Umpqua	Steamboat Cr	-122.5884	43.4331	17	0.00	18	0	11	17
UMP	1908	Umpqua River, North Umpqua	Steelhead Cr	-122.6525	43.3900	42	0.00	42	0	33	5
UMP	1937	Umpqua River, South Umpqua	Deer Cr	-123.2838	43.2184	16	0.00	19	0	0	0
UMP	2307	Umpqua River, South Umpqua	Sheilds Cr	-123.6161	43.0657	9	1.88	15	100	0	13
UMP	2309	Umpqua River, South Umpqua	Falcon Cr	-122.5452	42.9935	52	0.00	52	0	33	4
UMP	2368	Umpqua River, South Umpqua	Boulder Cr	-122.7816	43.0717	31	0.02	31	68	87	19
UMP	2414	Umpqua River, South Umpqua	Black Canyon Cr	-122.6907	42.9453	42	0.00	42	0	52	10
UMP	2439	Umpqua River, North Umpqua	Rock Cr, E Fk	-122.8286	43.3805	31	0.00	31	0	42	58
UMP	2472	Umpqua River, North Umpqua	Cavitt Cr	-122.9745	43.1464	62	0.00	62	0	24	11
UMP	**14160**	Umpqua River, Mainstem	Elk Creek	-123.4012	43.6601	8	0.00	9	0	0	0
UMP	**14190**	Umpqua River, Mainstem	South Umpqua River	-123.1324	42.9450	1	0.00	1	0	0	0
UMP	**14200**	Umpqua River, Mainstem	Smith River	-123.8194	43.7836	16	0.00	16	0	0	0
UMP	**14210**	Umpqua River, South Fork	Jackson Creek	-122.6747	42.9834	21	0.00	21	0	95	67
UMP	**14220**	Umpqua River, Mainstem	South Umpqua River	-123.4169	43.1473	3	0.00	3	0	0	0
UMP	**14230**	Umpqua River, South Fork	Cow Creek	-123.4883	42.9201	6	0.00	6	0	33	33
UMP	**14240**	Umpqua River, Mainstem	Smith River	-123.5442	43.7748	14	0.00	14	43	7	29
UMP	**14270**	Umpqua River, Mainstem	South Umpqua River	-123.6381	43.7627	4	0.00	4	0	25	0
UMP	**14280**	Umpqua River, Mainstem	Smith River	-122.7976	43.3231	19	0.00	19	37	21	16
UMP	**14290**	Umpqua River, Mainstem	North Umpqua River	-122.6134	43.3942	4	0.00	4	0	75	50
UMP	**14300**	Umpqua River, North Fork	Steamboat Creek	-123.5736	42.7743	8	0.00	8	0	88	63
UMP	**14310**	Umpqua River, South Fork	Cow Creek	-123.5735	42.7743	11	0.00	11	45	45	64
SC-coho	36	Rogue River, Main Stem	Grave Cr	-123.1686	42.6994	9	0.00	9	0	56	0
SC-coho	50	Rogue River, Main Stem	Wolf Cr	-123.4081	42.6954	5	0.00	5	20	40	0
SC-coho	53	Rogue River, Main Stem	Sugarpine Cr	-122.6829	42.8295	7	1.41	7	100	86	86
SC-coho	58	Rogue River, Main Stem	Elk Cr	-122.6384	42.7943	10	0.00	10	0	0	30
SC-coho	68	Rogue River, Main Stem	Sugarpine Cr	-122.6642	42.7807	7	6.20	7	100	57	14
SC-coho	91	Rogue River, Big Butte Creek	Big Butte Cr, N Fk	-122.5712	42.5592	7	2.87	7	100	86	14
SC-coho	122	Rogue River, Big Butte Creek	Big Butte Cr, N Fk	-122.5363	42.5529	6	1.43	7	100	100	57
SC-coho	165	Rogue River, Main Stem	Evans Cr	-122.9841	42.6066	6	0.00	6	0	0	0
SC-coho	209	Rogue River, Main Stem	Evans Cr, W Fk	-123.0424	42.6456	12	1.38	12	100	50	17
SC-coho	216	Rogue River, Main Stem	Cold Cr	-123.0494	42.6621	8	1.25	9	100	33	0

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SC-coho	224	Rogue River, Main Stem	Evans Cr, W Fk	-123.0841	42.6562	20	1.65	20	95	10	30
SC-coho	281	Rogue River, Main Stem	Grave Cr	-123.4384	42.6393	1	0.00	2	0	0	0
SC-coho	309	Rogue River, Main Stem	Jumpoff Joe Cr	-123.4832	42.5235	4	0.00	4	0	0	0
SC-coho	315	Rogue River, Main Stem	Quartz Cr	-123.4416	42.5211	14	0.00	14	0	14	0
SC-coho	317	Rogue River, Main Stem	Louse Cr	-123.4187	42.5195	7	0.01	7	14	14	0
SC-coho	342	Rogue River, Lobster Creek	Lobster Cr	-124.2896	42.5449	10	0.00	10	0	40	60
SC-coho	349	Rogue River, Main Stem	Quosatana Cr	-124.2271	42.4761	12	0.01	12	25	83	50
SC-coho	355	Rogue River, Lobster Creek	Boulder Cr	-124.1858	42.6254	21	0.00	21	0	57	29
SC-coho	397	Rogue River, Lobster Creek	Lobster Cr	-124.2955	42.5175	8	0.00	8	0	63	63
SC-coho	413	Rogue River, Lobster Creek	Lobster Cr, S Fk	-124.241	42.6166	7	0.01	7	29	86	71
SC-coho	415	Rogue River, Lobster Creek	Lobster Cr, N Fk	-124.2422	42.6340	7	0.01	7	57	0	0
SC-coho	436	Rogue River, Illinois River	Josephine Cr	-123.7259	42.2085	8	0.00	8	0	75	0
SC-coho	465	Rogue River, Illinois River	Wood Cr	-123.6815	42.0704	14	1.49	14	100	0	0
SC-coho	466	Rogue River, Illinois River	Wood Cr	-123.6756	42.0654	14	1.49	14	100	0	0
SC-coho	532	Rogue River, Illinois River	Althouse Cr	-123.5983	42.1181	8	0.53	8	88	38	13
SC-coho	561	Rogue River, Illinois River	Illinois R, E Fk	-123.6288	42.0330	5	1.48	5	100	80	20
SC-coho	567	Rogue River, Illinois River	Wood Cr	-123.6723	42.0446	19	1.83	21	95	24	0
SC-coho	629	Rogue River, Main Stem	Soda Cr	-122.5085	42.3526	18	0.36	18	72	0	0
SC-coho	722	Rogue River, Main Stem	Louse Cr	-123.3407	42.4949	1	0.66	1	100	100	0
SC-coho	768	Rogue River, Applegate River	Williams Cr, E Fk	-123.2629	42.1870	11	1.11	11	82	82	64
SC-coho	773	Rogue River, Applegate River	Thompson Cr	-123.233	42.1585	10	1.77	10	100	60	50
SC-coho	781	Rogue River, Applegate River	Williams Cr, E Fk	-123.2606	42.1785	11	0.19	11	100	55	27
SC-coho	789	Rogue River, Applegate River	Thompson Cr	-123.2004	42.2055	19	0.16	19	74	32	21
SC-coho	801	Rogue River, Illinois River	Deer Cr, N Fk	-123.4452	42.2744	9	2.31	9	100	22	33
SC-coho	802	Rogue River, Illinois River	Deer Cr, N Fk	-123.4405	42.2805	17	1.08	17	100	29	47
SC-coho	869	Rogue River, Applegate River	Waters Cr	-123.5525	42.3704	0	-	8	100	88	25
SC-coho	885	Rogue River, Illinois River	Clear Cr	-123.6197	42.3067	12	0.52	12	100	58	8
SC-coho	896	Rogue River, Applegate River	Slate Cr	-123.5357	42.3630	0	-	5	100	100	0
SC-coho	914	Rogue River, Illinois River	Crooks Cr	-123.4996	42.3091	13	1.93	14	100	0	29
SC-coho	935	Rogue River, Illinois River	Thompson Cr	-123.542	42.2567	1	3.70	1	100	100	100
SC-R sthd	1801	Rogue River, Main Stem	Dead Indian Creek	-122.4506	42.3305	22	0.18	22	64	77	0
SC-R sthd	1802	Rogue River, Main Stem	McNeil Creek	-122.6364	42.5685	0	-	1	0	-	-
SC-R sthd	1803	Rogue River, Big Butte Creek	North Fork Big Butte Cr	-122.4914	42.5618	10	1.03	11	100	55	27
SC-R sthd	1804	Rogue River, Bear Creek	Wagner Creek	-122.7802	42.2453	0	-	10	0	-	-

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SC-R sthd	1809	Rogue River, Elk Creek	Dodes Creek	-122.6549	42.4880	0	-	1	0	0	0
SC-R sthd	1812	Rogue River, Little Butte Creek	Nichols Branch	-122.7713	42.4433	0	-	13	0	-	-
SC-R sthd	2002	Rogue River, Quosatana Creek	Unnamed Trib.	-124.2247	42.6639	28	0.00	29	0	17	0
SC-R sthd	2004	Rogue River, Main Stem	Little Windy Creek	-123.7368	42.0609	11	0.00	11	0	82	0
SC-R sthd	2005	Rogue River, Illinois River	Left Fork Sucker Creek	-123.4005	42.1108	6	0.00	6	0	100	17
SC-R sthd	2006	Rogue River, Illinois River	Briggs Creek	-123.7902	42.4693	5	0.00	5	0	100	20
SC-R sthd	2009	Rogue River, Applegate River	Little Applegate River	-122.8204	42.5486	13	0.00	13	0	77	0
SC-R sthd	2010	Rogue River, Illinois River	Myers Creek	-123.6713	42.4991	6	0.00	6	0	0	0
SC-R sthd	2012	Rogue River, Galice Creek	South Fork Galice Cr.	-123.6266	42.7178	11	0.00	11	9	0	0
SC-R sthd	2015	Rogue River, Illinois River	Indigo Creek	-123.9937	42.4117	7	0.00	7	0	43	29
SC-R sthd	2017	Rogue River, Main Stem	Wolf Creek	-123.3342	42.7012	9	0.00	9	0	22	0
SC-R sthd	2019	Rogue River, Main Stem	Fruitdale Creek	-123.3057	42.5650	9	0.66	9	78	22	0
SC-R sthd	2020	Rogue River, Main Stem	Hewitt Creek	-123.8025	42.4046	14	0.00	14	0	29	0
SC-R sthd	2023	Rogue River, Lobster Creek	Deadline Creek	-124.2504	42.6338	11	0.19	11	45	64	9
SC-R sthd	2026	Rogue River, Illinois River	Pine Creek	-123.8574	42.1051	16	0.00	16	0	31	0
SC-R sthd	2027	Rogue River, Main Stem	Battle Creek	-123.0912	42.7118	8	0.00	8	0	88	0
SC-R sthd	2028	Rogue River, Illinois River	Lawson Creek	-124.0417	42.5967	10	0.00	10	0	0	0
SC-R sthd	2029	Rogue River, Applegate River	Beaver Creek	-123.0203	42.1890	17	0.00	17	0	88	24
SC-R sthd	2030	Rogue River, Main Stem	Kelsey Creek	-123.7649	42.2723	17	0.00	17	0	100	0
SC-R sthd	**2301**	Rogue River, Main Stem	Big Butte Creek	-122.6524	42.4235	10	0.90	10	100	80	70
SC-R sthd	**2401**	Rogue River, Applegate River	Little Applegate River	-123.0267	42.5358	3	0.28	3	100	100	0
SC-R sthd	**2402**	Rogue River, Illinois River	Deer Creek	-123.6244	42.5875	0	-	3	33	33	0
SC-R sthd	**2404**	Rogue River, Main Stem	Illinois River	-124.0134	42.3044	3	0.00	3	0	0	0
SC-R sthd	**2405**	Rogue River, Main Stem	Evans Creek	-123.1556	42.3187	3	0.00	3	0	0	0
SC-R sthd	**2406**	Rogue River, Main Stem	Evans Creek	-123.0125	42.1455	9	0.03	9	33	78	22
SC-R sthd	**2407**	Rogue River, Main Stem	Illinois River	-123.7681	42.2224	4	0.00	4	0	25	0
SC-R sthd	**2409**	Rogue River, Applegate River	Applegate River	-123.2721	42.3334	0	-	1	0	100	100
SC-R sthd	**2411**	Rogue River, Illinois River	Sucker Creek	-123.5493	42.5297	4	1.78	4	100	100	25
SC-NR sthd	1601	Chetco River, Main Stem	Chetco River	-123.8936	42.2193	23	0.00	23	0	100	39
SC-NR sthd	1603	Chetco River, Main Stem	Tincup Creek	-124.0095	42.6603	31	0.00	31	0	90	35
SC-NR sthd	1604	Euchre Creek, Main Stem	Cedar Creek	-124.3670	42.1292	12	0.02	12	33	25	50
SC-NR sthd	1606	Pistol River, South Fork	South Fork Pistol River	-124.2517	42.2766	26	0.00	26	0	42	12
SC-NR sthd	1608	Brush Creek, Main Stem	Brush Creek	-124.4012	42.6622	58	0.00	58	5	83	7
SC-NR sthd	1610	Chetco River, Mainstem	Elk Creek	-124.1979	42.0798	29	0.00	34	0	44	3

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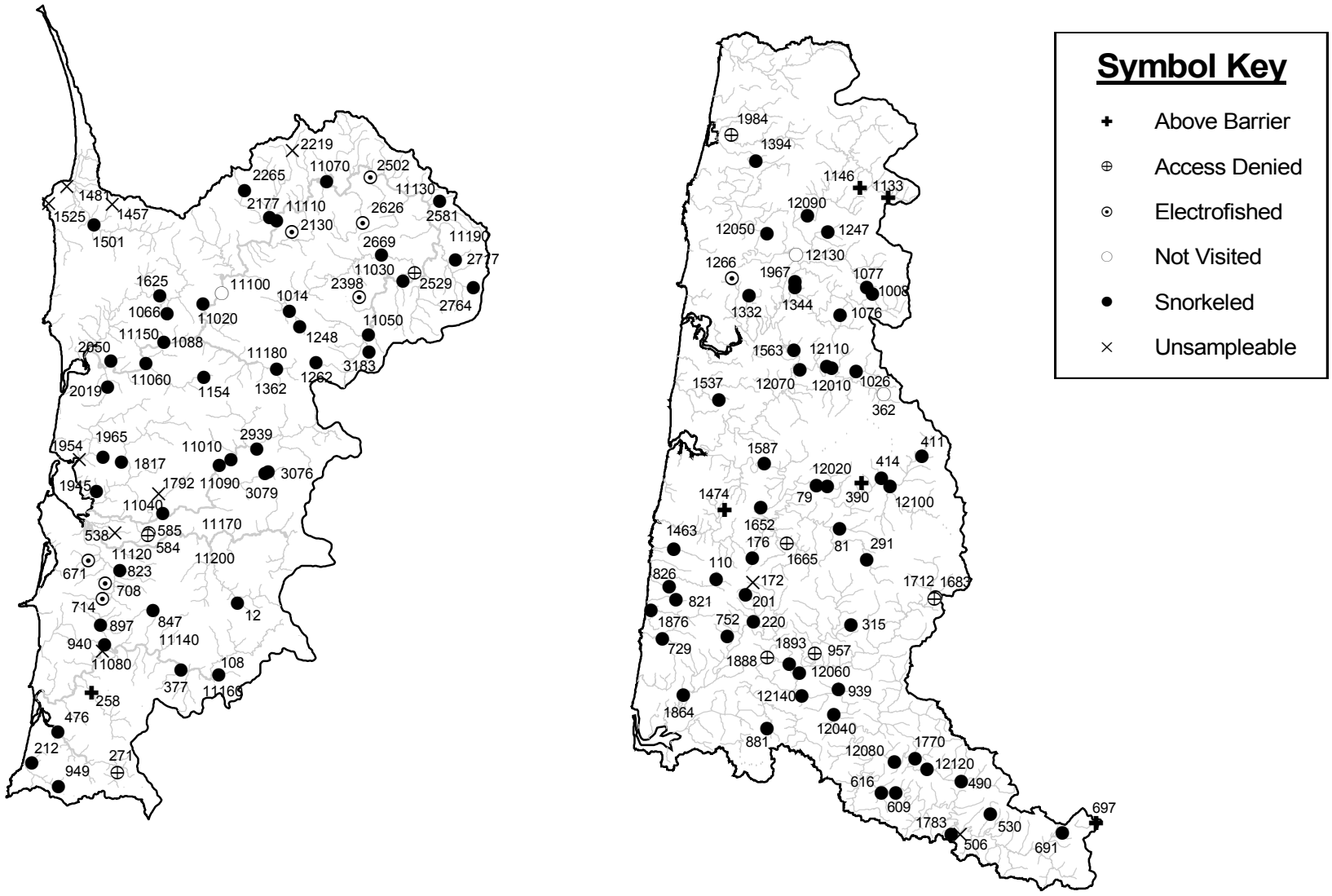
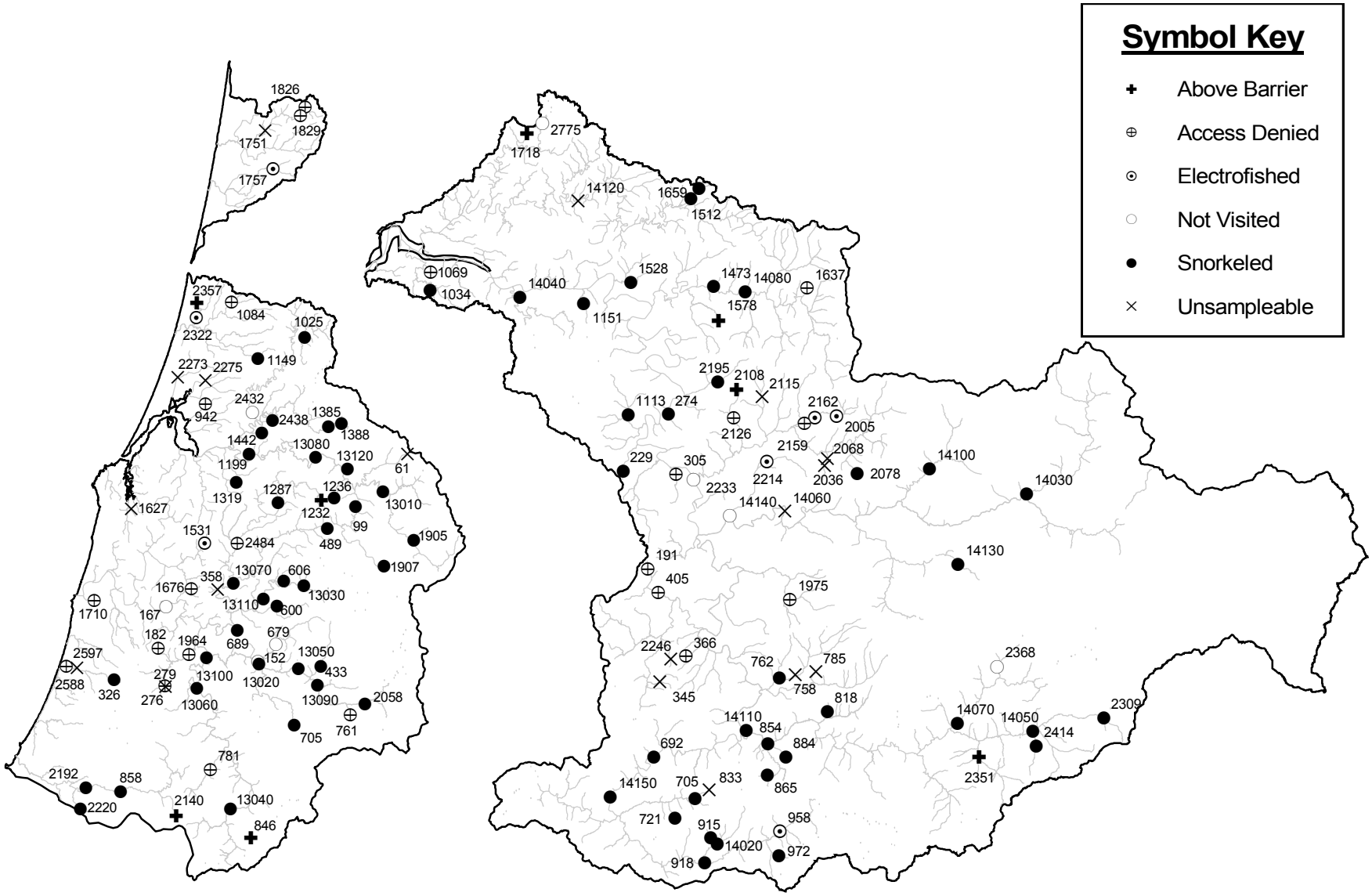
SC-NR sthd	1611	Chetco River, Main Stem	Box Canyon Creek	-123.9336	42.7144	28	0.00	28	0	100	36
SC-NR sthd	1612	Brush Creek, Main Stem	Brush Creek	-124.4128	42.2177	27	0.07	27	67	74	30
SC-NR sthd	1613	Winchuck River, Main Stem	East Fork Winchuck R.	-124.0537	42.7691	29	0.11	29	69	86	72
SC-NR sthd	1614	Elk River, Main Stem	South Fork Elk River	-124.2043	42.1869	21	0.00	21	0	81	67
SC-NR sthd	1615	Chetco River, Mainstem	Eagle Creek	-124.1453	42.3133	34	0.00	34	0	94	47
SC-NR sthd	1616	Elk River, Main Stem	Elk River	-124.4593	42.3046	8	0.00	8	0	38	25
SC-NR sthd	1617	Chetco River, Main Stem	Little Chetco River	-123.8655	42.6164	25	0.00	25	0	96	8
SC-NR sthd	1618	Pistol River, Main Stem	Pistol River	-124.2350	42.1364	23	0.00	23	0	30	100
SC-NR sthd	1619	Pistol River, Main Stem	Pistol River	-124.2469	42.1504	16	0.00	16	19	88	100
SC-NR sthd	1620	Mussel Creek, Mainstem	Unnamed Trib.	-124.3449	42.1892	14	0.00	14	0	43	14
SC-NR sthd	1621	Chetco River, Emily Creek	Unnamed Trib.	-124.1021	42.7389	37	0.00	37	0	27	5
SC-NR sthd	1622	Ocean Trib.	Whalehead Creek	-124.3440	42.0532	36	0.00	36	0	64	0
SC-NR sthd	1623	Chetco River, South Fork	South Fork Chetco R.	-124.1143	42.0918	14	0.00	14	0	100	57
SC-NR sthd	1624	Elk River, Main Stem	Elk River	-124.4146	42.2704	5	0.00	6	17	83	83
SC-NR sthd	1625	Winchuck River, Main Stem	East Fork Winchuck R.	-124.0867	42.0498	19	0.05	20	65	80	80
SC-NR sthd	1626	Chetco River, North Fork	North Fork Chetco R.	-124.2131	42.7174	6	0.00	6	0	83	83
SC-NR sthd	1627	Chetco River, Main Stem	Granite Creek	-123.9025	42.3492	20	0.00	20	0	95	40
SC-NR sthd	1628	Elk River, Main Stem	Elk River	-124.3255	42.7959	7	0.00	7	0	14	14
SC-NR sthd	1629	Winchuck River, East Fork	Fourth of July Creek	-124.0666	42.1542	10	0.00	10	10	80	40
SC-NR sthd	1630	Elk River, Main Stem	Elk River	-124.2885	42.2952	11	0.01	11	9	82	73
SC-NR sthd	1631	Hunter Creek, Main Stem	Hunter Creek	-124.3520	42.3041	16	0.06	16	25	94	81
SC-NR sthd	1632	Elk River, Main Stem	Elk River	-124.5040	42.3657	7	0.00	7	0	71	29
SC-NR sthd	1633	Chetco River, Mainstem	Brokencot Creek	-123.8986	42.0466	27	0.00	28	0	57	0
SC-NR sthd	1634	Pistol River, Main Stem	Pistol River	-124.2651	42.0868	8	0.00	8	0	63	13
SC-NR sthd	1635	Chetco River, Main Stem	Chetco River	-124.0050	42.0994	12	0.00	12	0	83	58
SC-NR sthd	1637	Hunter Creek, Main Stem	Hunter Creek	-124.4013	42.3034	8	0.00	8	0	75	75
SC-NR sthd	1638	Winchuck River, Mainstem	Fourth of July Creek	-124.0823	42.7126	24	0.03	24	29	63	33
SC-NR sthd	1640	Winchuck River, Main Stem	Wheeler Creek	-124.1328	42.1812	30	0.00	30	0	80	53
SC-NR sthd	1641	Chetco River, North Fork	North Fork Chetco R.	-124.2295	42.3185	10	0.00	10	0	90	90
SC-NR sthd	1642	Chetco River, Main Stem	Chetco River	-123.9669	42.2820	14	0.00	14	0	86	50
SC-NR sthd	1643	Elk River, Main Stem	Elk River	-124.3076	42.5933	8	0.00	8	0	0	0
SC-NR sthd	1644	Chetco River, Main Stem	Little Chetco River	-123.8540	42.1332	28	0.00	29	0	66	0
SC-NR sthd	1645	Pistol River, North Fork	North Fork Pistol River	-124.2685	42.0178	22	0.00	23	0	83	74
SC-NR sthd	1646	Chetco River, Mainstem	Mislatnah Creek	-124.0785	42.0821	23	0.00	23	0	57	61

Monitoring Area	Site	Basin Name, Subbasin Name	Reach	Longitude (decimal)	Latitude (decimal)	Density (fish/m^2)		Occurrence (% of pools with fish)			
						N pools	Coho	N pools	Coho	Sthd	Cutt
SC-NR sthd	1647	Eucher Creek, Main Stem	Cedar Creek	-124.3280	42.2139	0	-	3	0	0	0
SC-NR sthd	1648	Chetco River, Mainstem	Emily Creek	-124.1131	42.0295	25	0.00	25	8	56	32
SC-NR sthd	**2201**	Winchuck River, Main Stem	Winchuck River	-124.1360	42.1663	10	0.00	10	0	70	90

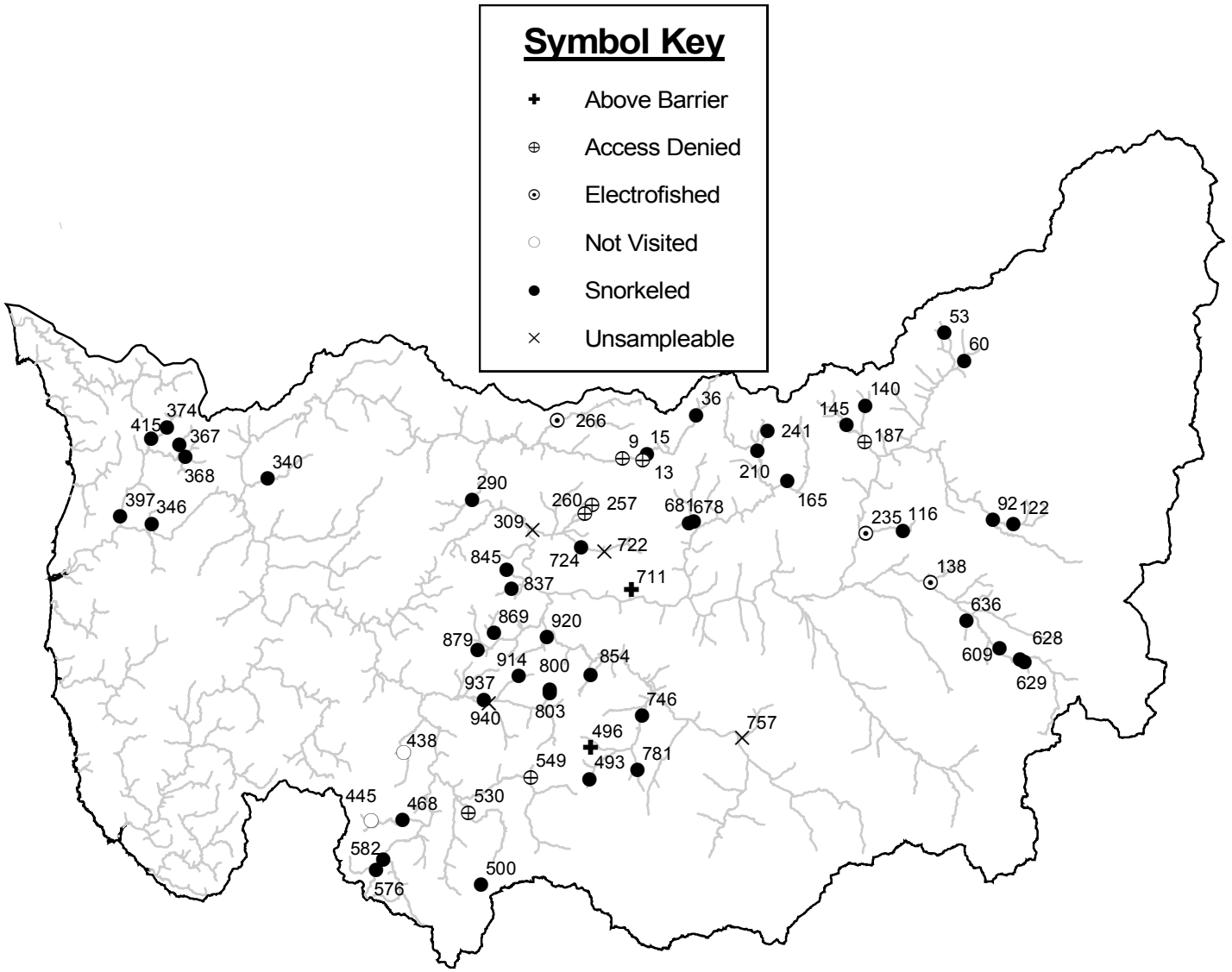
Appendix 2. 1. Location and status of candidate streams and sites for juvenile salmonid surveys in the North and South Coast, summer 2002. Sites numbered > 10000 are 4th – 5th order streams. The site numbers next to each point may be cross-referenced to the data shown in Appendix 1.1.



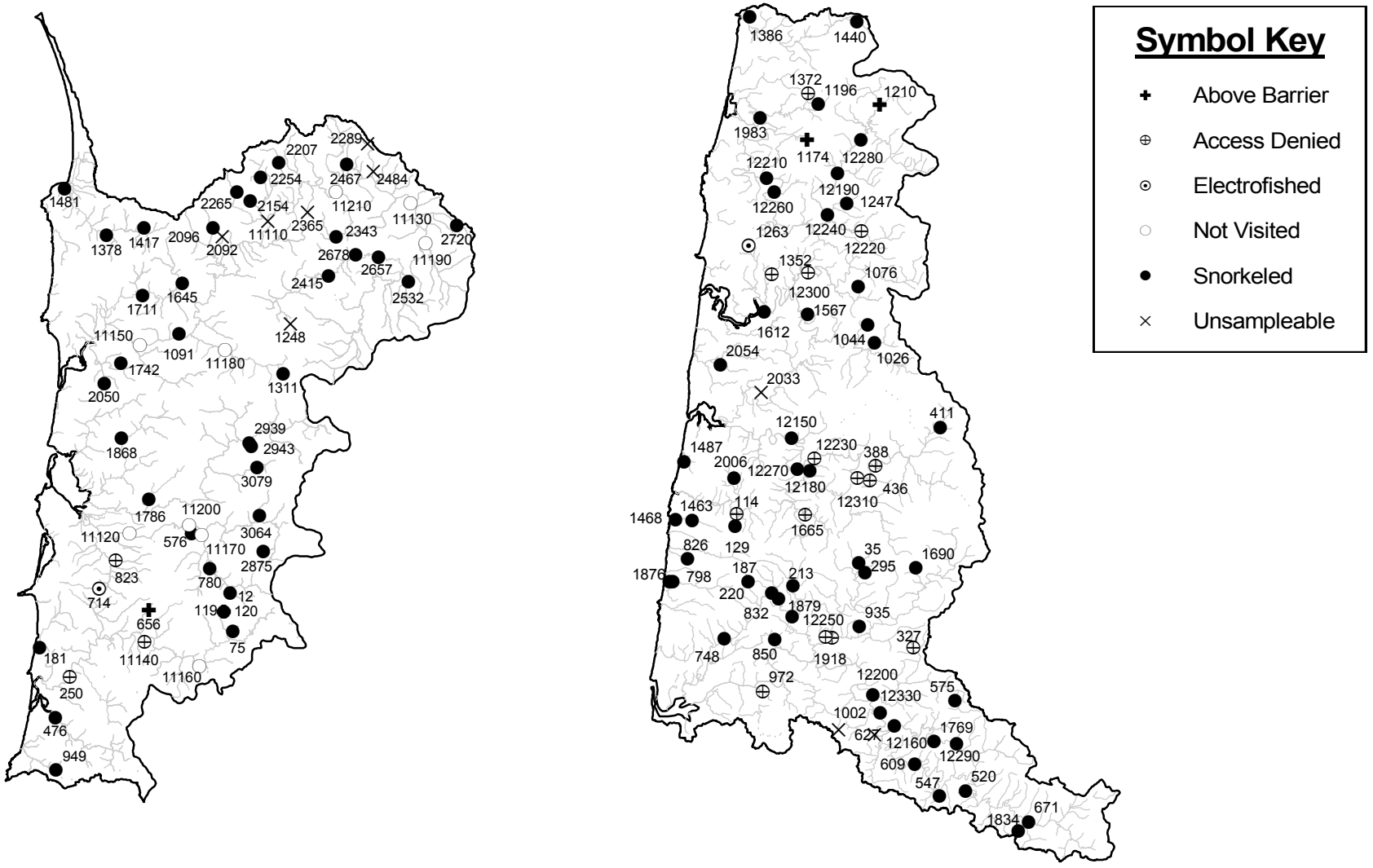
Appendix 2. 2. Location and status of candidate streams and sites for juvenile salmonid surveys in the Mid-South Coast and Umpqua, summer 2002. Sites numbered > 10000 are 4th – 5th order streams. The site numbers next to each point may be cross-referenced to the data shown in Appendix 1.1.



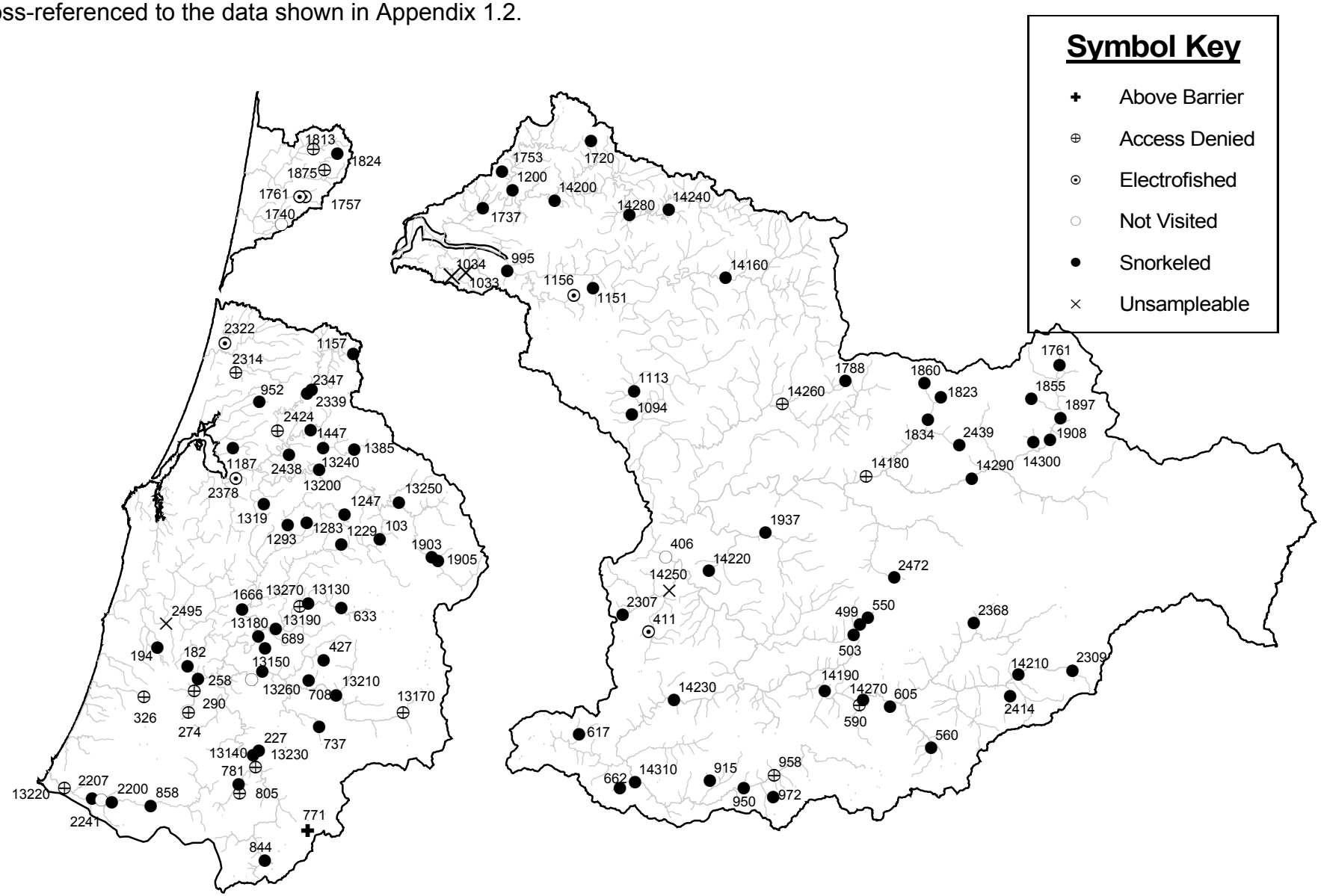
Appendix 2. 3. Location and status of candidate streams and sites for juvenile salmonid surveys in the South Coast, summer 2002. Only 1st-3rd order sites from the coho distribution coverage are included. The site numbers next to each point may be cross-referenced to the data shown in Appendix 1.1.



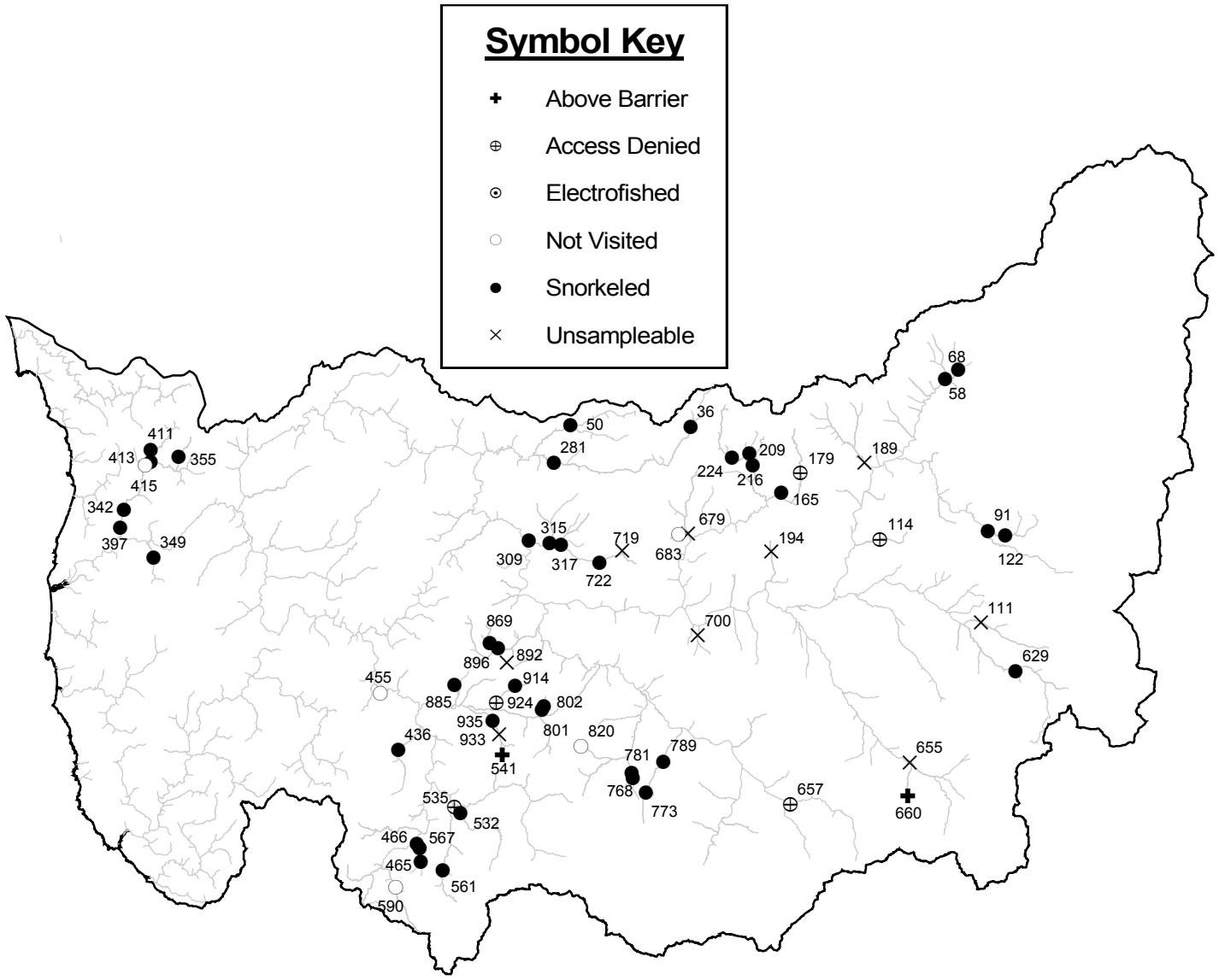
Appendix 2. 4. Location and status of candidate streams and sites for juvenile salmonid surveys in the North Coast and Mid Coast, summer 2003. Sites numbered > 10000 are 4th – 5th order streams. The site numbers next to each point may be cross-referenced to the data shown in Appendix 1.2.



Appendix 2. 5. Location and status of candidate streams and sites for juvenile salmonid surveys in the Mid-South Coast and Umpqua, summer 2003. Sites numbered > 10000 are 4th – 5th order streams. The site numbers next to each point may be cross-referenced to the data shown in Appendix 1.2.

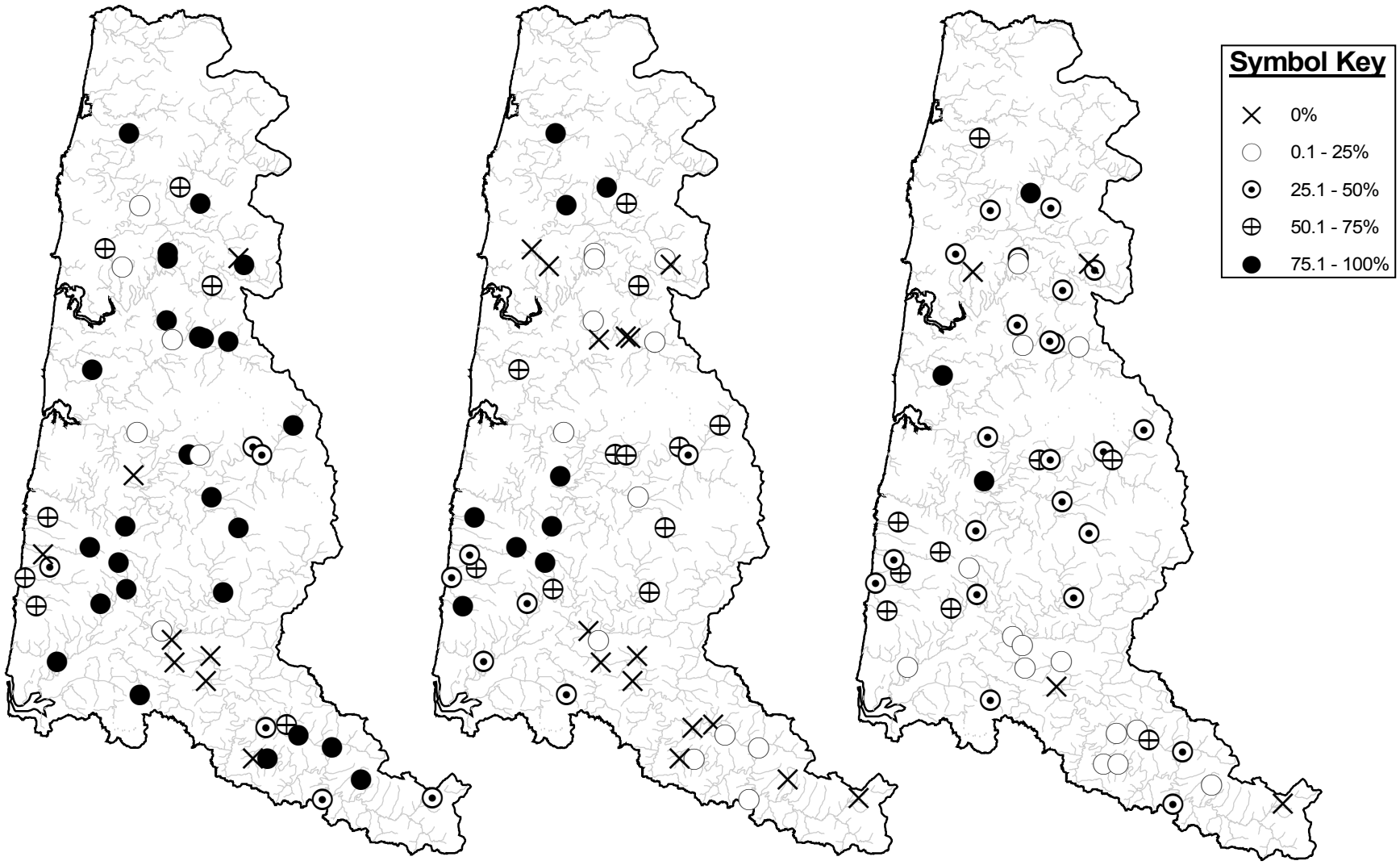


Appendix 2. 6. Location and status of candidate streams and sites for juvenile salmonid surveys in the South Coast, summer 2003. Only 1st-3rd order sites from the coho distribution coverage are included. The site numbers next to each point may be cross-referenced to the data shown in Appendix 1.2.

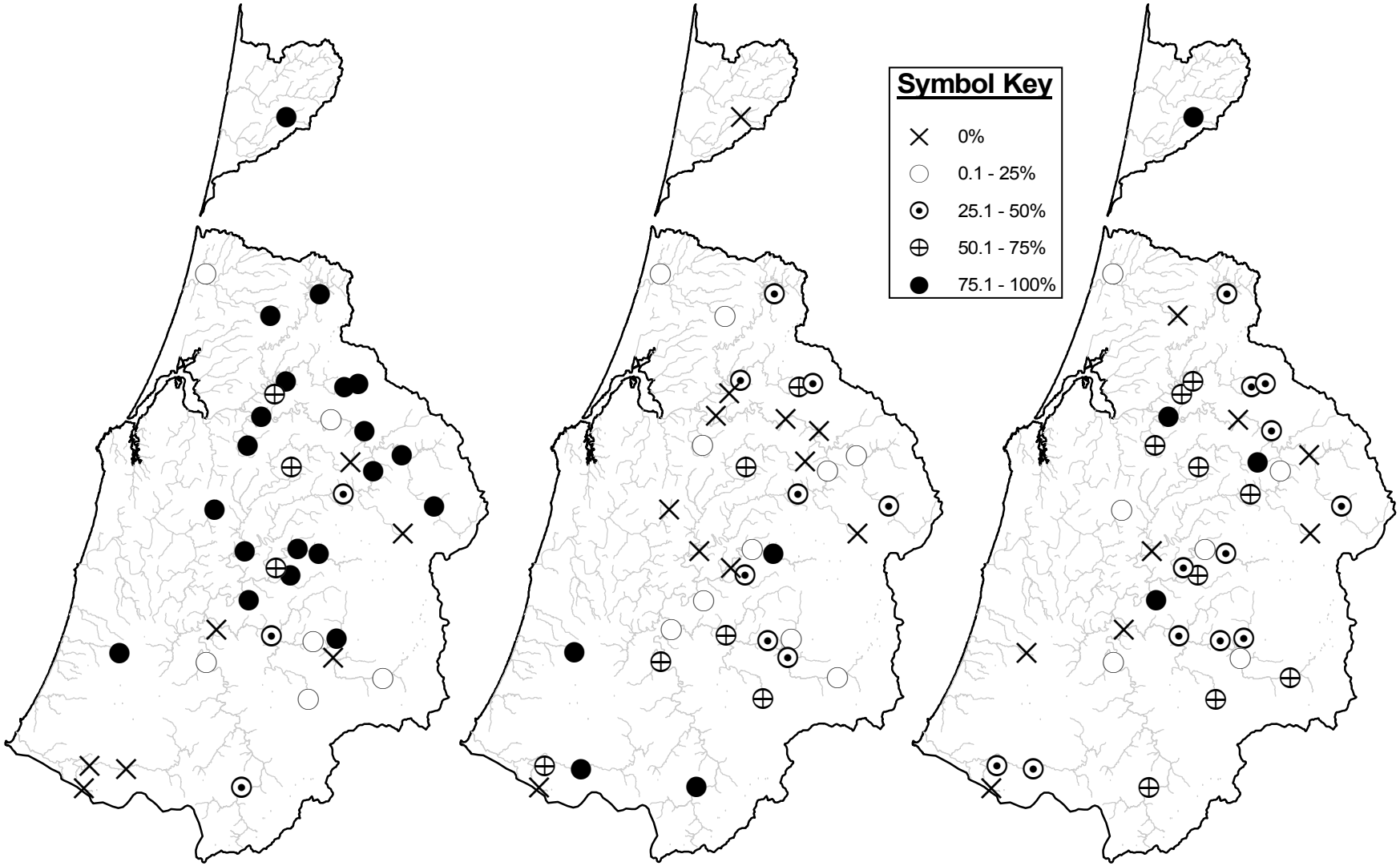


Appendix 3. 1. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2002 in the North Coast (see Appendix 1.1 for site data). Panels from left to right are for coho, steelhead, and cutthroat.

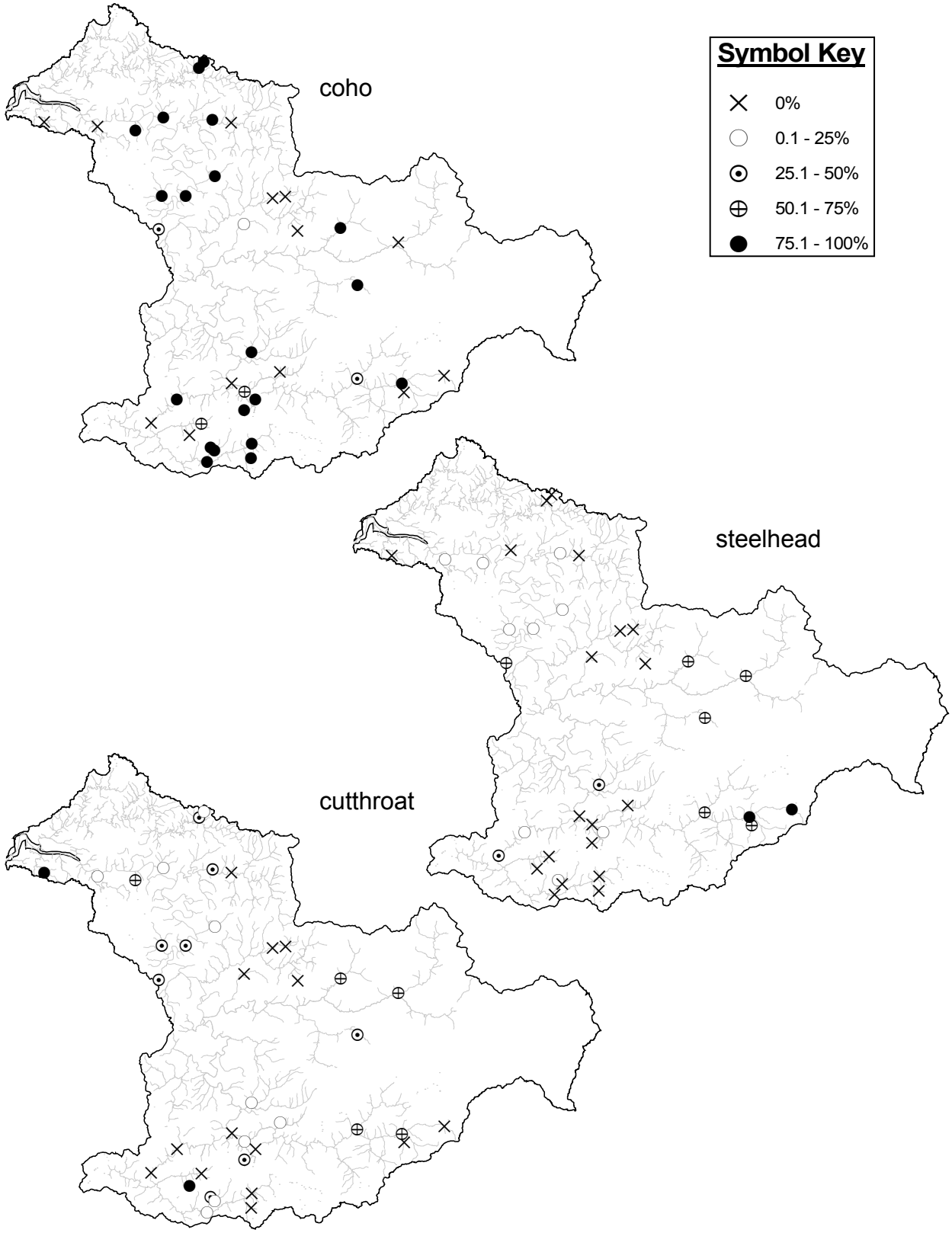
Appendix 3. 2. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2002 in the Mid Coast (see Appendix 1.1 for site data). Panels from left to right are for coho, steelhead, and cutthroat.



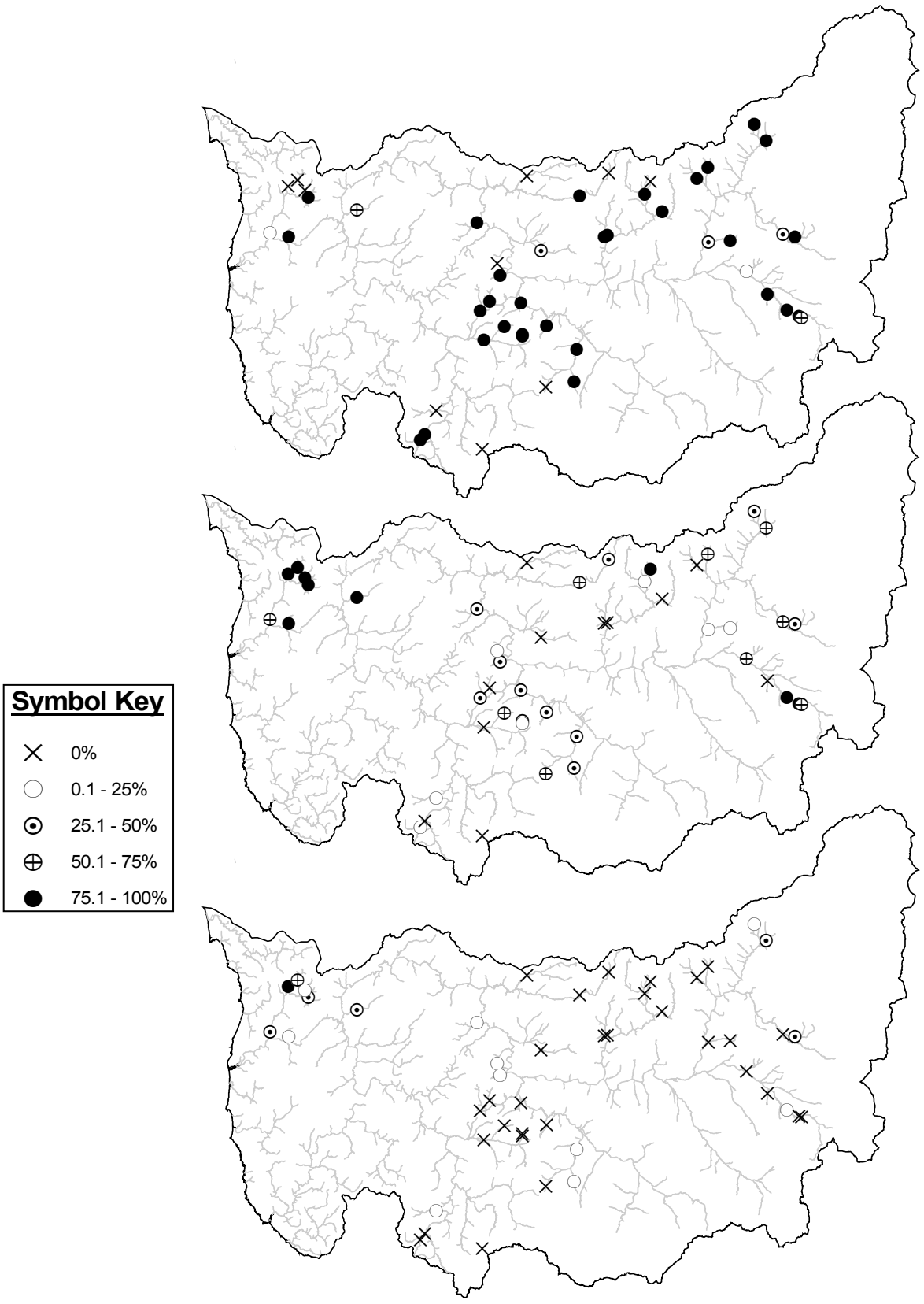
Appendix 3. 3. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2002 in the Mid-South Coast (see Appendix 1.1 for site data). Panels from left to right are for coho, steelhead, and cutthroat.



Appendix 3. 4. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2002 in the Umpqua (see Appendix 1.1 for site data).

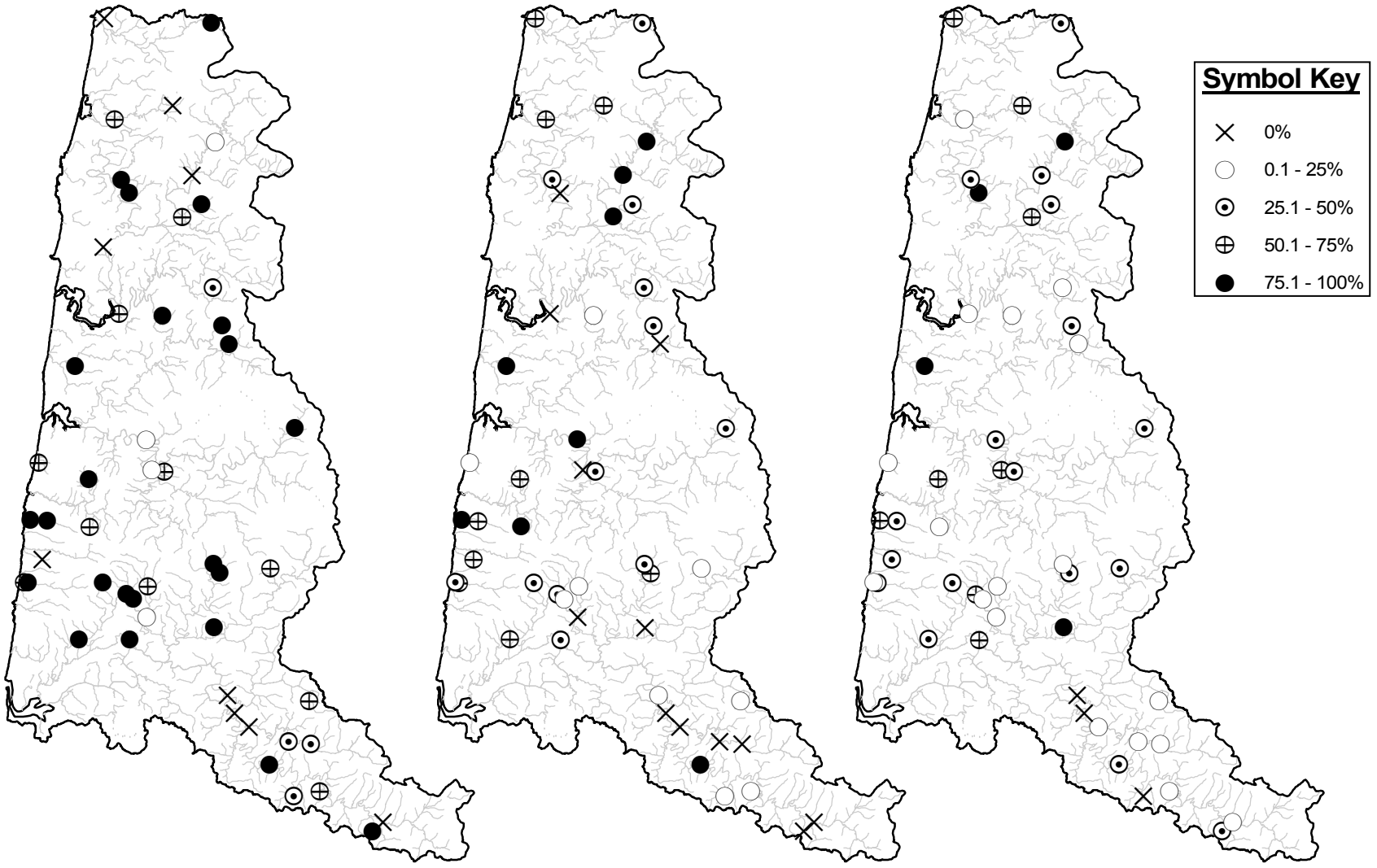


Appendix 3. 5. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2002 in the South Coast (see Appendix 1.1 for site data). Only 1st-3rd order sites from the coho distribution coverage are included. Panels from top to bottom are for coho, steelhead, and cutthroat.

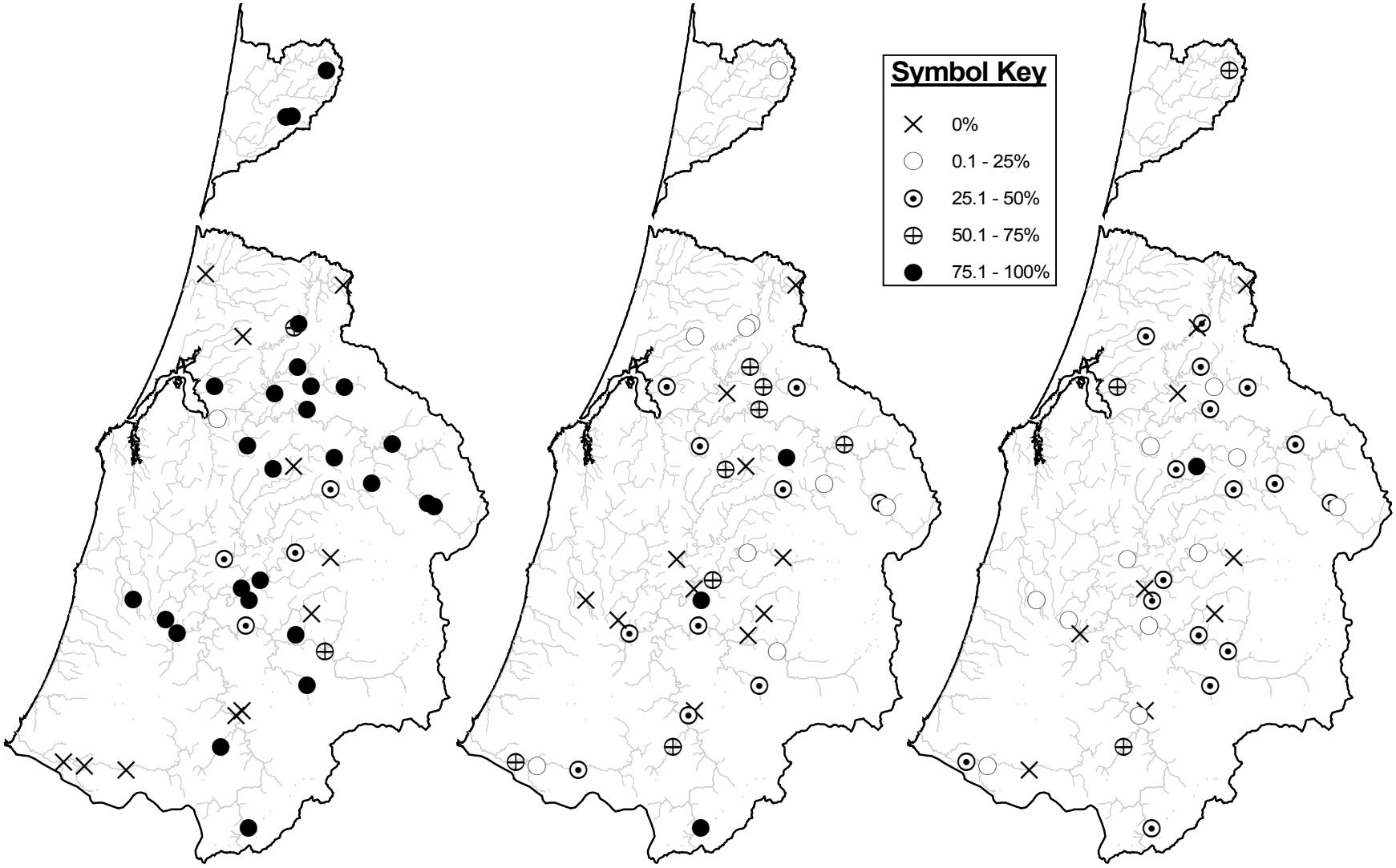


Appendix 3. 6. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2003 in the North Coast (see Appendix 1.2 for site data). Panels from left to right are for coho, steelhead, and cutthroat.

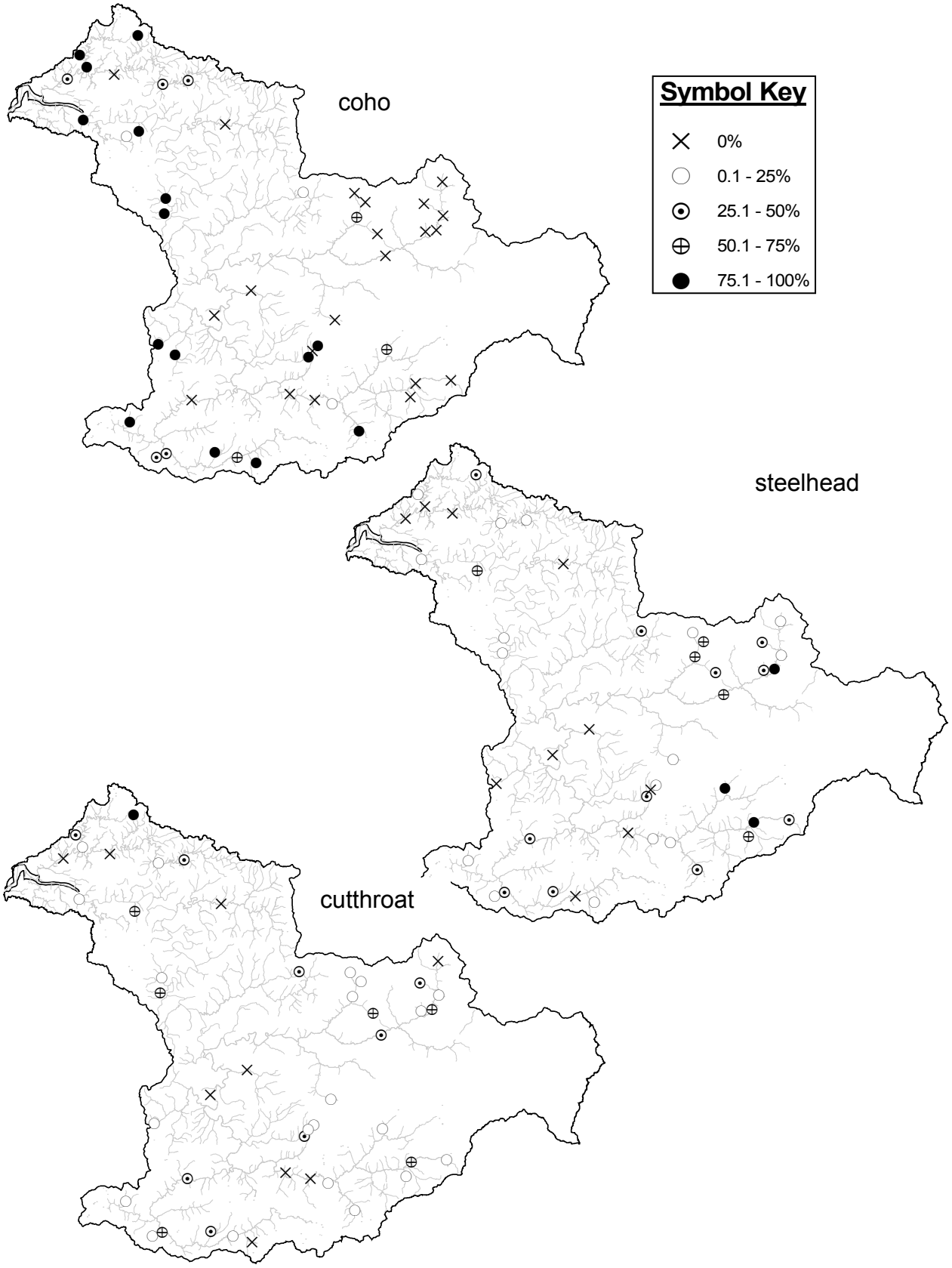
Appendix 3. 7. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2003 in the Mid Coast (see Appendix 1.2 for site data). Panels from left to right are for coho, steelhead, and cutthroat.



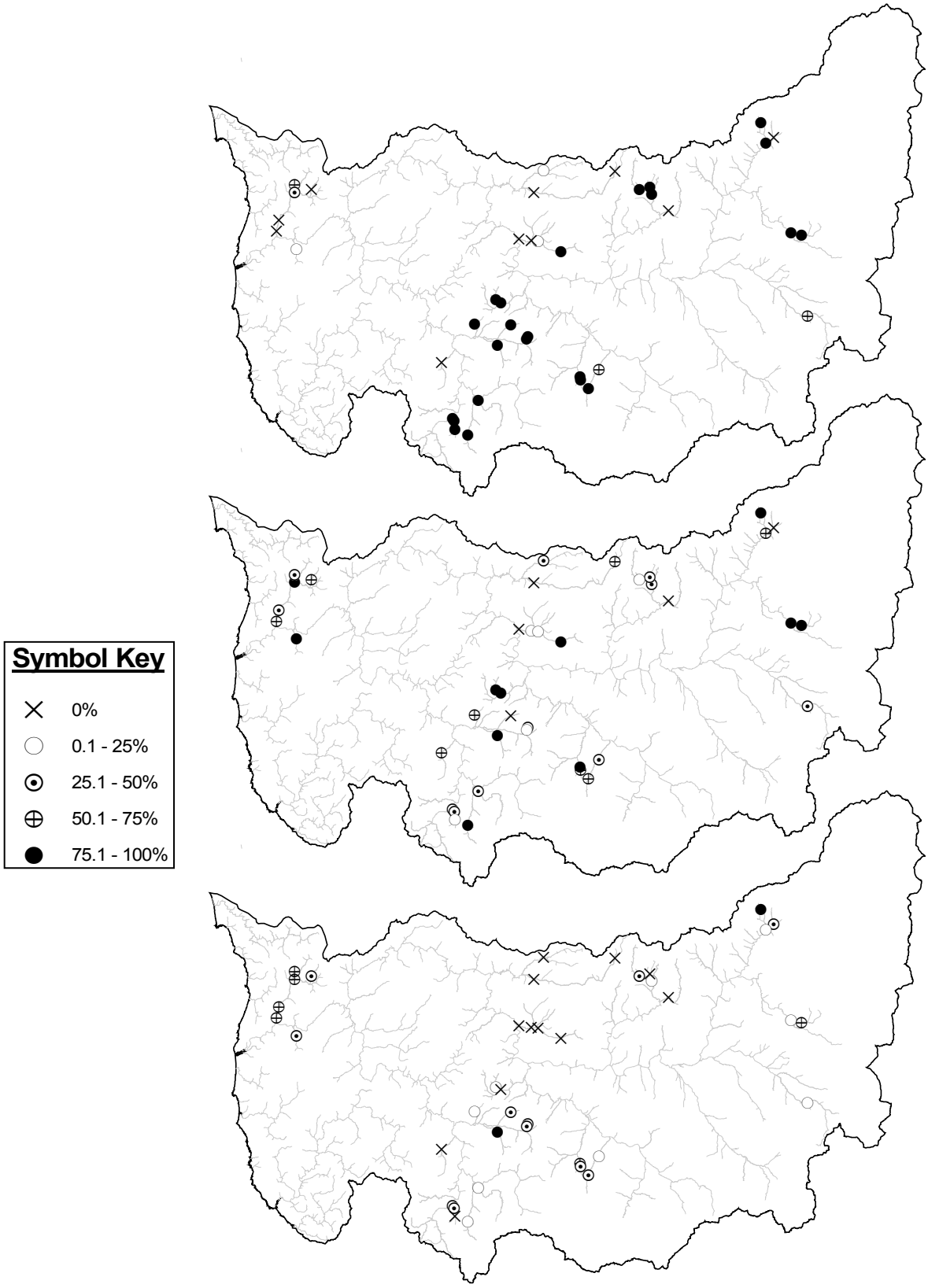
Appendix 3. 8. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2003 in the Mid-South Coast (see Appendix 1.2 for site data). Panels from left to right are for coho, steelhead, and cutthroat.



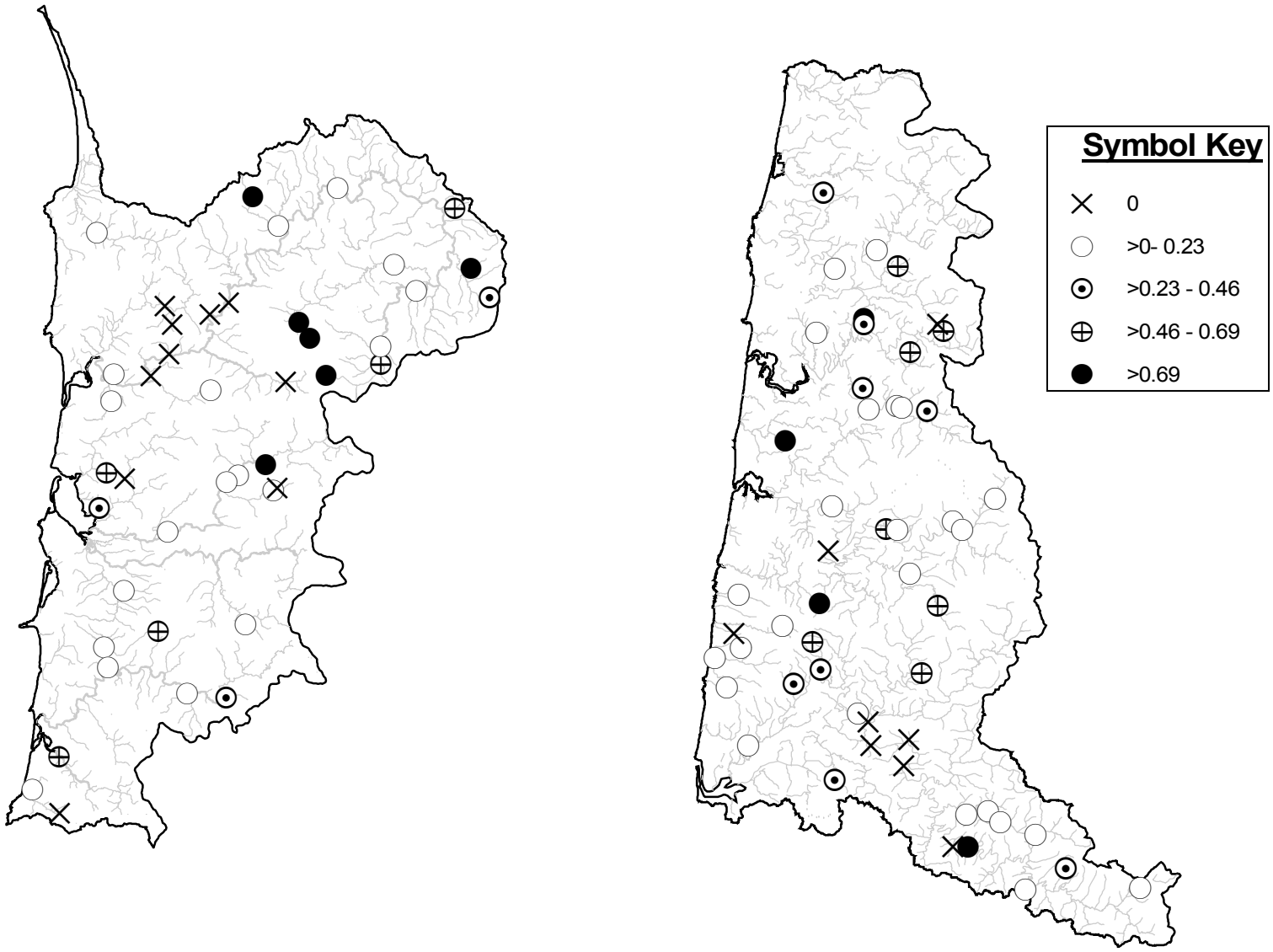
Appendix 3. 9. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2003 in the Umpqua (see Appendix 1.2 for site data).



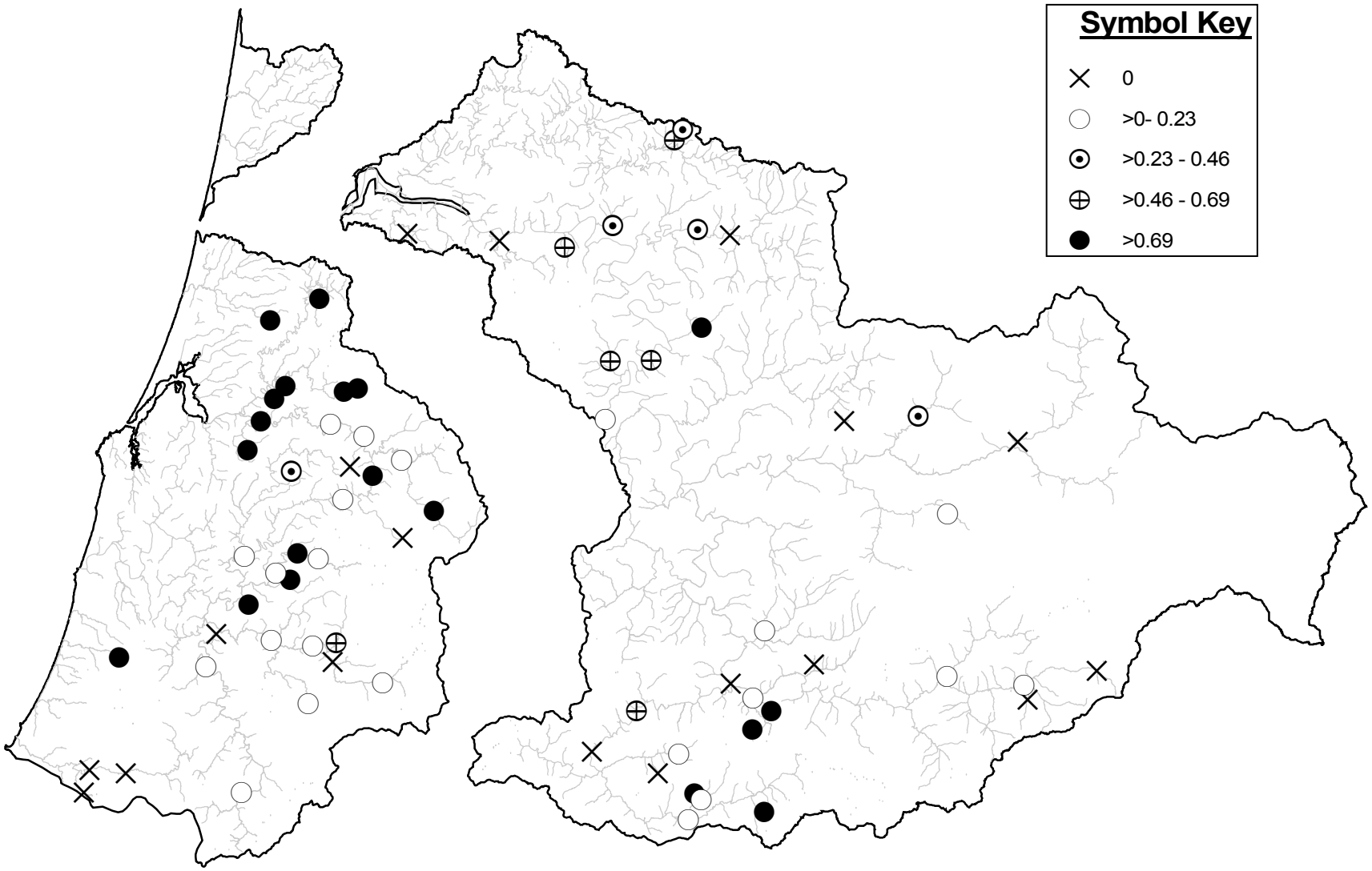
Appendix 3. 10. Percentage of pools that contained juvenile salmonids at each site snorkeled or electrofished in the summer of 2003 in the South Coast (see Appendix 1.2 for site data). Only 1st-3rd order sites from the coho distribution coverage are included. Panels from top to bottom are for coho, steelhead, and cutthroat.



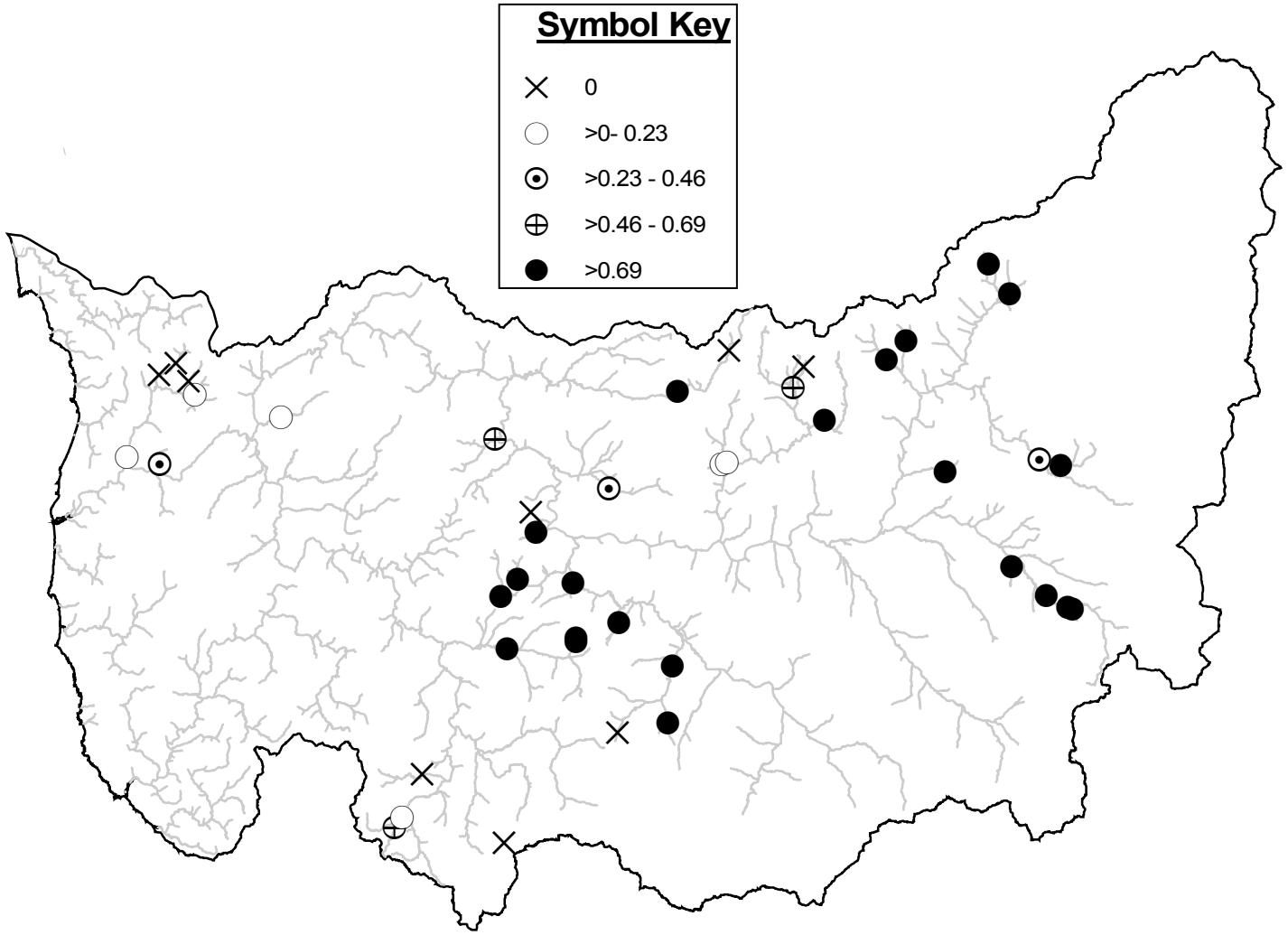
Appendix 4. 1. Density of juvenile coho at North Coast and Mid Coast sites in 2002 (see Appendix 1.1 for site data).



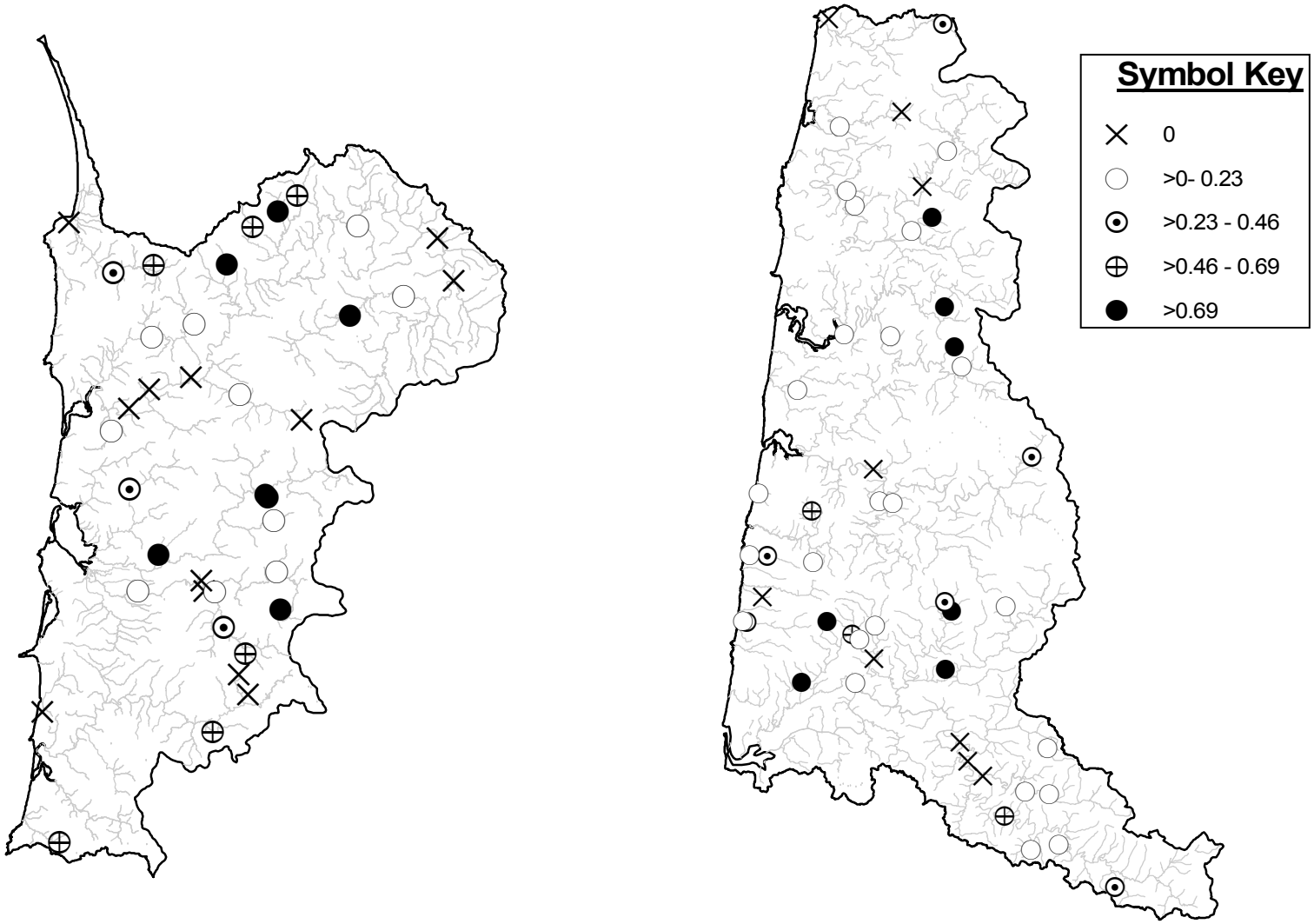
Appendix 4. 2. Density of juvenile coho at Mid-South Coast and Umpqua sites in 2002 (see Appendix 1.1 for site data).



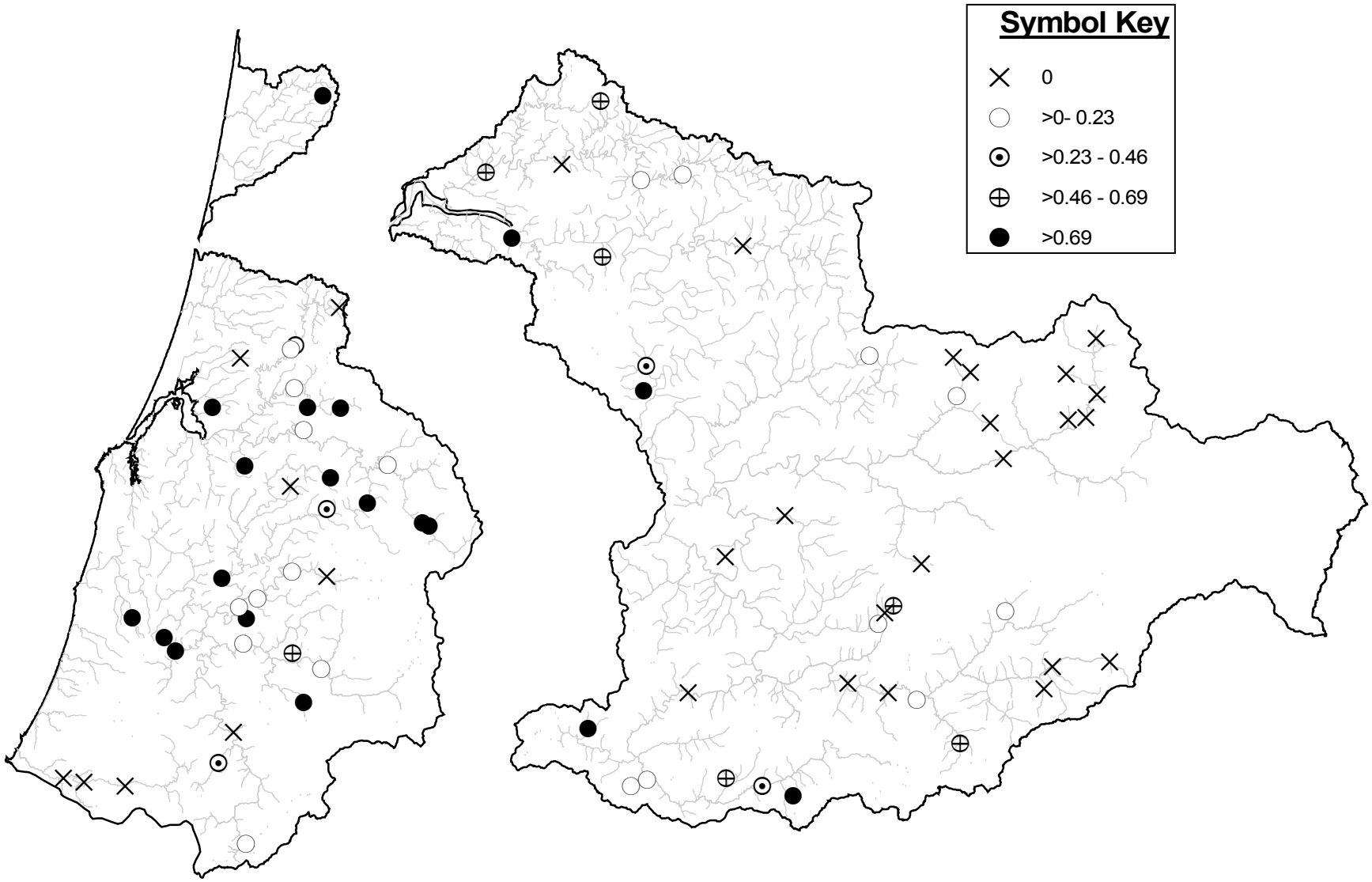
Appendix 4. 3. Density of juvenile coho at South Coast tributary sites in 2002. Only 1st-3rd order sites from the coho distribution coverage are included. (see Appendix 1.1 for site data).



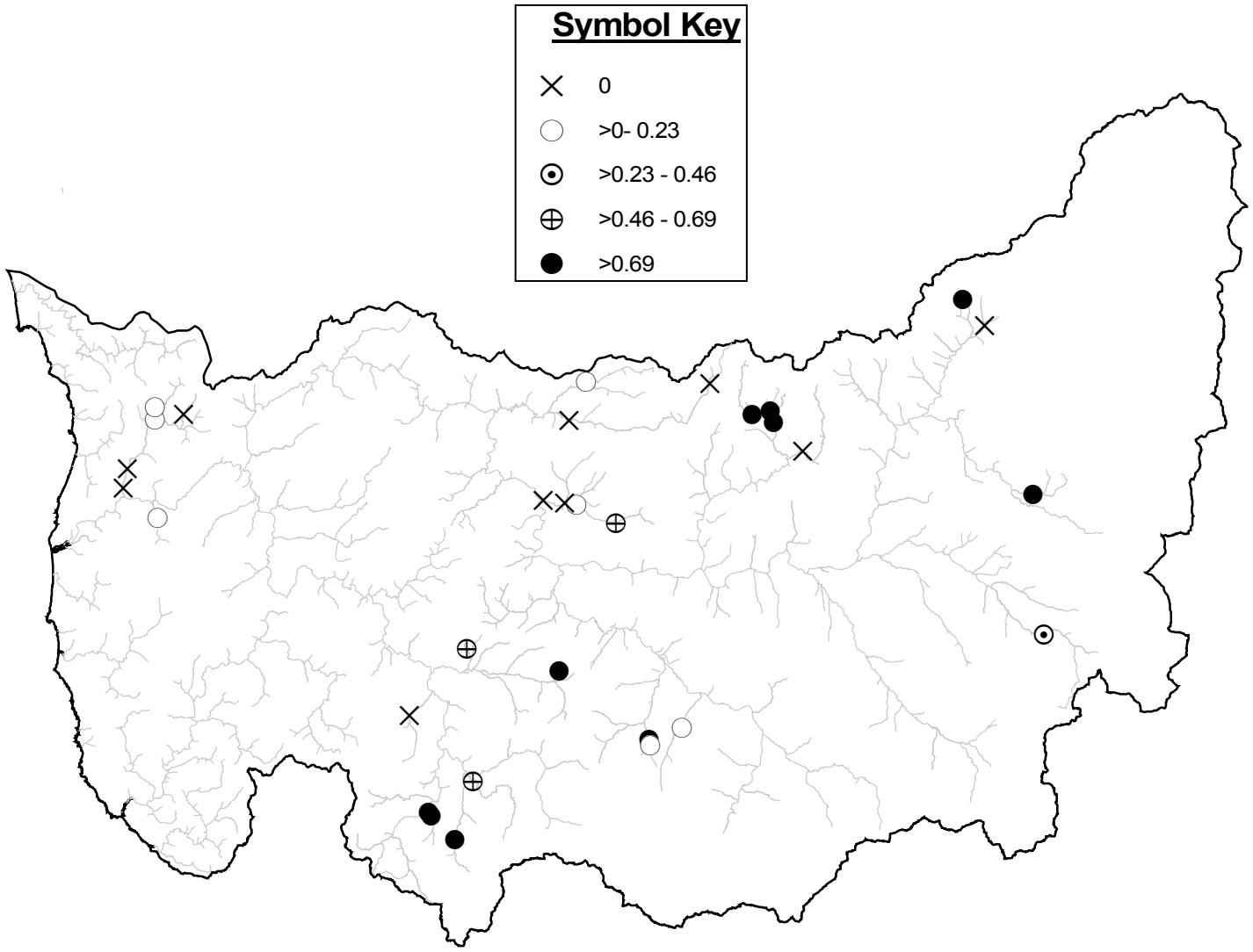
Appendix 4. 4. Density of juvenile coho at North Coast and Mid Coast sites in 2003 (see Appendix 1.2 for site data).



Appendix 4. 5. Density of juvenile coho at Mid-South Coast and Umpqua sites in 2003 (see Appendix 1.2 for site data).



Appendix 4. 6. Density of juvenile coho at South Coast tributary sites in 2003. Only 1st-3rd order sites from the coho distribution coverage are included (see Appendix 1.2 for site data).



Appendix 5. 1. Estimated number of juvenile salmonids and physical characteristics of sites sampled by electrofishing in Smith River, summer 2002. Cutt=Cutthroat, Sthd=Steelhead. See Figure 36 for location of sample sites.

	Number of Juvenile Fish																	Substrate (%)			
Site	Coho	Cutt	Sthd	Trout ≥ 90 mm	Site Length (m)	Wetted Surface Area (m^2)	Average Wetted Width (m)	Maximum Depth (cm)	Dry Channel Length (m)	Glide Length (m)	Glide Surface Area (m^2)	Number of Glides	Pool Length (m)	Pool Surface Area (m^2)	Number of Pools	Riffle/ Rapid Length (m)	Riffle/ Rapid Surface Area (m^2)	Number of Riffles/ Rapids	Silt/ Sand	Gravel	Cobble/ Boulder	Bedrock
14500	0	0	0	0	26				26.0													
14700	0	0	0	0	24				24.0													
14800	255	18	7	206	150.8	593.8	3.9	43					42.0	192.54	4	108.8	401.23	4	21.8	18.8	40.0	19.5
14900	231	43	0	5	125.7	448.4	3.2	75					98.2	405.91	7	27.5	42.51	4	47.3	38.3	0.0	0.0
15000	69	0	1	0	40	22.2	1.0	71	21.7				18.3	22.19	5				76.2	23.8	0.0	0.0
15100	166	15	1	8	122.2	434.6	3.7	97					103.3	382.99	4	18.9	51.66	1	59.8	30.0	10.2	0.0
15200	419	11	9	24	209.4	976.2	4.4	62					147.9	822.43	7	61.5	153.73	4	16.2	11.1	11.9	60.8
15300	0	0	0	0	20				20.0													
15400	0	0	0	0	7				7.0													
15500	0	0	0	0	36				36.0													
15600	50	9	0	3	87.9	130.2	1.5	41					41.7	66.01	7	46.2	64.18	5	26.9	27.9	42.4	2.7
15800	0	0	0	0	38				38.0													
15900	101	4	0	26	231.1	1567.2	6.6	75					154.1	1271.16	5	77.0	296.05	2	12.2	13.3	10.6	63.9
16000	0	0	0	8	87.7	332.2	3.5	14					6.5	19.07	1	81.2	313.13	2	7.8	0.0	0.0	92.2
16100	32	0	0	9	38.2	57.2	1.5	18		4.9	6.4	1	8.6	13.77	2	24.7	37.09	4	12.5	13.5	7.9	66.1
16200	8	2	0	0	33.4	33.3	1.2	35					7.2	9.47	2	26.2	23.80	2	27.0	29.0	42.5	1.5
16300	161	9	25	194	212	1183.5	5.9	41		52.5	318.3	2	46.1	352.66	1	113.4	512.58	2	2.7	3.8	14.5	79.0
16400	135	21	25	104	134.6	310.5	2.5	61					65.1	180.15	4	69.5	130.30	4	12.5	11.0	34.2	42.2
16500	77	3	0	0	73.2	165.7	2.0	55		8.3	14.7	1	38.2	109.58	3	26.7	41.42	3	50.1	21.5	0.0	2.7
16600	108	6	0	3	64.9	109.9	1.6	50					39.1	85.96	5	25.8	23.94	4	60.8	20.7	17.1	1.4
16700	31	8	2	2	51.2	76.2	2.2	42	22.6	2.2	1.8	1	26.4	74.33	5				23.8	29.6	0.0	0.0
16800	344	8	7	34	180.5	871.4	4.8	45		43.2	205.6	4	120.4	588.91	4	16.9	76.86	2	14.3	7.4	12.1	66.2
16900	163	2	0	3	147.9	506.3	3.5	88	7.5				140.4	506.30	5				40.4	29.1	26.5	4.0
17000	75	3	0	0	60.9	95.1	1.6	60	2.1				35.7	71.61	6	23.1	23.45	3	16.8	41.5	41.7	0.0
17200	0	2	0	1	34.2	45.3	1.4	40					12.5	18.55	2	21.7	26.76	1	50.5	20.0	23.6	5.9
17300	61	5	0	2	68.9	122.4	1.7	78		14.5	27.43	3	44.4	81.11	7	10.0	13.96	2	63.7	34.9	1.4	0.0
17400	104	9	1	15	59.9	230.4	3.5	59					48.5	202.70	2	11.4	27.74	1	48.8	32.4	17.0	1.8
17500	0	0	0	0	36				36.0													
17700	2	0	0	0	83	1.4	0.5	10	80.9				2.1	1.41	2				38.2	0.0	0.0	61.8
17800	81	4	1	5	72.3	115.7	1.6	50		11.1	13.3	1	35.0	78.69	5	26.2	23.69	3	25.1	20.0	0.0	0.0
18000	0	0	0	2	39.5	53.0	1.4	20					18.4	41.09	2	21.1	11.96	2	22.3	20.0	17.8	39.9

Appendix 5. 2. Estimated number of juvenile salmonids and physical characteristics of sites sampled by electrofishing in Smith River, summer 2003. Cutt=Cutthroat, Sthd=Steelhead. See Figure 36 for location of sample sites.

	Number of Juvenile Fish																		Substrate (%)			
Site	Coho	Cutt	Sthd	Trout ≥ 90 mm	Site Length (m)	Wetted Surface Area (m^2)	Average Wetted Width (m)	Maximum Depth (cm)	Dry Channel Length (m)	Glide Length (m)	Glide Surface Area (m^2)	Number of Glides	Pool Length (m)	Pool Surface Area (m^2)	Number of Pools	Riffle/ Rapid Length (m)	Riffle/ Rapid Surface Area (m^2)	Number of Riffles/ Rapids	Silt/ Sand	Gravel	Cobble/ Boulder	Bedrock
217	7	3	0	0	68.9	71.0	1.0	37	1.3				27.4	43.0	7	40.2	28.0	6	27.1	38.0	34.9	0.0
218	0	0	0	1	30.9	48.2	1.5	17		8.2	12.8	1	4.4	6.3	1	18.3	29.0	2	87.4	12.6	0.0	0.0
219	64	17	3	24	167.2	855.3	5.0	105					139.5	819.3	3	27.7	36.0	1	42.8	20.6	2.1	34.5
220	235	25	8	51	155.1	778.0	4.5	58					105.6	508.6	6	49.5	269.4	5	13.5	58.4	17.9	10.2
221	0	0	0	0	17.6	10.0	0.6	0								17.6	10.0	1	90.0	10.0	0.0	0.0
224	108	10	0	8	125.7	203.3	1.6	45	7.0				58.0	131.8	5	60.7	71.5	5	35.9	26.5	13.9	23.6
225					66.0	0.0			66.0													
226					25.0	0.0			25.0													
228	57	4	0	4	53.3	60.0	1.1	40					20.2	37.5	2	33.1	22.5	3	8.4	13.1	4.5	74.0
229	3	1	0	0	40.2	44.4	1.1	30					21.7	29.1	5	18.5	15.2	5	42.3	53.8	3.9	0.0
230	276	36	0	25	227.1	2257.4	9.9	130					227.1	2257.4	1				40.0	10.0	20.0	30.0
231	328	1	0	11	151.9	109.8	2.2	45	102.5				44.1	102.7	6	5.3	7.1	1	23.4	53.1	17.5	5.9
232	521	3	6	60	239.2	1386.3	6.0	50		33.9	213.6	1	60.9	476.6	4	144.4	696.1	5	4.9	12.7	28.2	54.1
233	145	0	0	0	72.5	10.8	1.3	20	63.9				8.6	10.8	2				42.2	28.2	29.6	0.0
234	86	12	1	2	183.3	275.0	1.7	60	15.0				59.6	154.7	8	108.7	120.3	7	36.7	11.5	2.0	49.7
235					102.0	0.0			102.0													
237	208	7	0	4	170.7	919.8	5.1	75					170.7	919.8	4				50.0	4.5	0.0	45.5
238	161	0	2	10	65.3	123.3	1.9	40					21.5	49.6	3	43.8	73.7	4	18.6	24.7	29.8	26.8
239	217	11	0	14	298.0	1857.8	6.8	100					117.0	818.7	5	181.0	1039.1	4	20.0	3.8	9.6	66.6
240	0	1	0	0	52.7	35.8	0.7	15					16.0	11.3	3	36.7	24.5	4	34.4	63.9	1.7	0.0
241	136	5	0	2	154.4	531.0	3.1	80		14.3	18.6	1	108.8	409.2	5	31.3	103.2	6	25.9	42.0	15.2	16.9
242	630	9	2	29	191.6	795.4	3.5	64					129.8	602.8	10	61.8	192.5	9	24.2	20.2	3.1	52.5
243	134	7	0	11	120.2	263.5	1.5	94					84.5	229.5	6	35.7	34.0	6	43.5	28.1	2.5	26.0
244	110	10	0	1	94.0	116.4	1.7	70	31.0				36.4	71.0	7	26.6	45.4	2	24.4	65.3	10.3	0.0
245	166	5	9	28	147.4	872.1	5.7	110					124.8	754.1	4	22.6	118.0	2	17.1	52.5	5.9	24.4
246	103	29	26	74	194.0	1194.1	5.2	60					110.8	781.8	7	83.2	412.3	8	15.0	9.9	30.8	44.3
247	108	7	0	6	159.4	530.1	2.9	110					112.1	461.7	6	47.3	68.3	5	44.0	53.1	0.0	3.0
248	0	1	0	15	40.0	51.0	1.3	0								40.0	51.0	1	10.0	10.0	80.0	0.0
249	90	9	0	0	82.2	64.8	1.6	48	45.6				36.6	64.8	8				71.8	28.2	0.0	0.0
250	0	0	0	0	25.7	16.4	0.8	25	4.0				10.7	9.8	2	11.0	6.6	1	100	0.0	0.0	0.0
251	367	6	12	103	325.4	3071.9	8.8	75					176.5	1914.4	5	148.9	1157.5	6	15.3	12.6	27.2	45.0
252	0	0	0	0	81.0	0.3	0.3	10	79.9				1.1	0.3	1				0.0	20.0	80.0	0.0

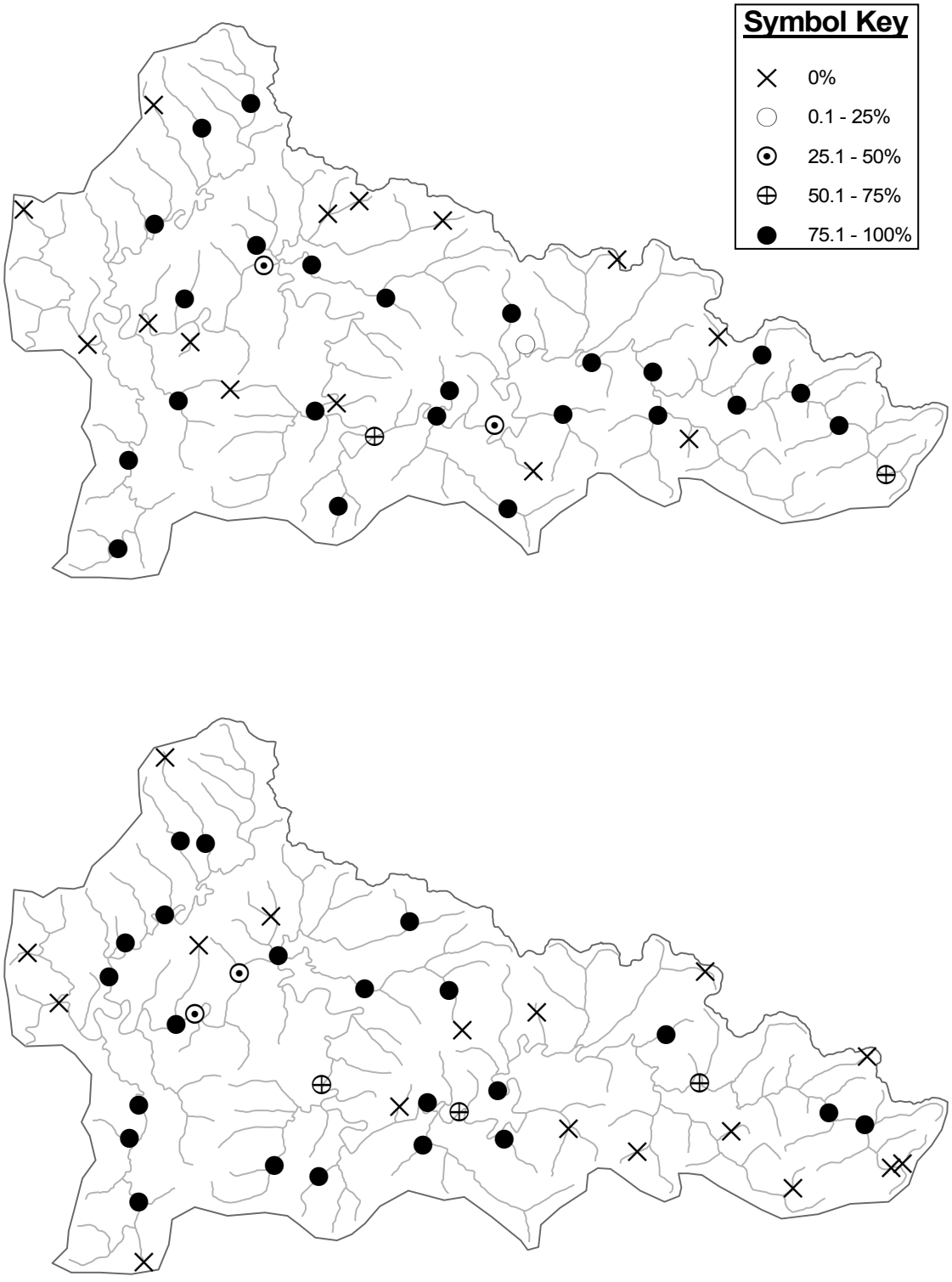
Appendix 6. 1. Number of pools snorkeled, fish observed, and density of juvenile coho, cutthroat and steelhead based on snorkel surveys in the Smith River basin, summer 2002. Bolded sites are non-wadeable sites in the mainstem Smith River. See Figure 49 for location of sample sites.

Site	N pools Snorkeled	Number of Fish Observed			Average Fish/m^2		
		Coho	Cutthroat ≥90 mm	Steelhead ≥90 mm	Coho	Cutthroat ≥90 mm	Steelhead ≥90 mm
146	12	187	5	1	0.0403	0.0011	0.0001
148	15	385	17	52	0.6096	0.0326	0.0703
149	22	416	46	33	0.5051	0.0549	0.0388
150	1	14	1	4	1.7500	0.1250	0.5000
151	35	570	28	5	0.4255	0.0238	0.0059
152	21	599	14	1	0.2314	0.0066	0.0004
156	15	105	24	1	0.5968	0.1303	0.0038
159	11	325	6	2	0.2426	0.0026	0.0012
160	3	96	7	0	1.2429	0.1228	0.0000
161	9	0	3	0	0.0000	0.0261	0.0000
163	19	937	17	0	0.1942	0.0045	0.0000
164	21	811	73	30	0.8332	0.0735	0.0322
165	7	84	1	3	0.5093	0.0037	0.0251
166	5	63	6	0	1.2076	0.1570	0.0000
167	1	1	0	0	0.1250	0.0000	0.0000
168	16	723	16	6	0.3072	0.0092	0.0022
169	31	1426	11	1	1.1871	0.0104	0.0008
170	10	118	3	0	0.8867	0.0190	0.0000
173	20	361	7	1	0.6381	0.0153	0.0015
174	21	473	56	2	0.7140	0.0915	0.0053
177	4	50	6	0	0.8077	0.0881	0.0000
178	11	101	6	4	0.6531	0.0399	0.0226
179	29	435	5	1	0.1891	0.0013	0.0005
180	2	0	1	0	0.0000	0.0556	0.0000
200	10	66	0	0	0.0038	0.0000	0.0000
600	12	597	13	6	0.0957	0.0016	0.0015
700	8	0	1	0	0.0000	0.0001	0.0000
1000	20	5	2	0	0.0008	0.0001	0.0000
1100	10	0	1	0	0.0000	0.0001	0.0000
1500	14	17	0	0	0.0016	0.0000	0.0000
1800	23	633	12	37	0.1620	0.0022	0.0111
2200	7	298	3	0	0.0420	0.0002	0.0000
2300	7	3	1	0	0.0009	0.0005	0.0000

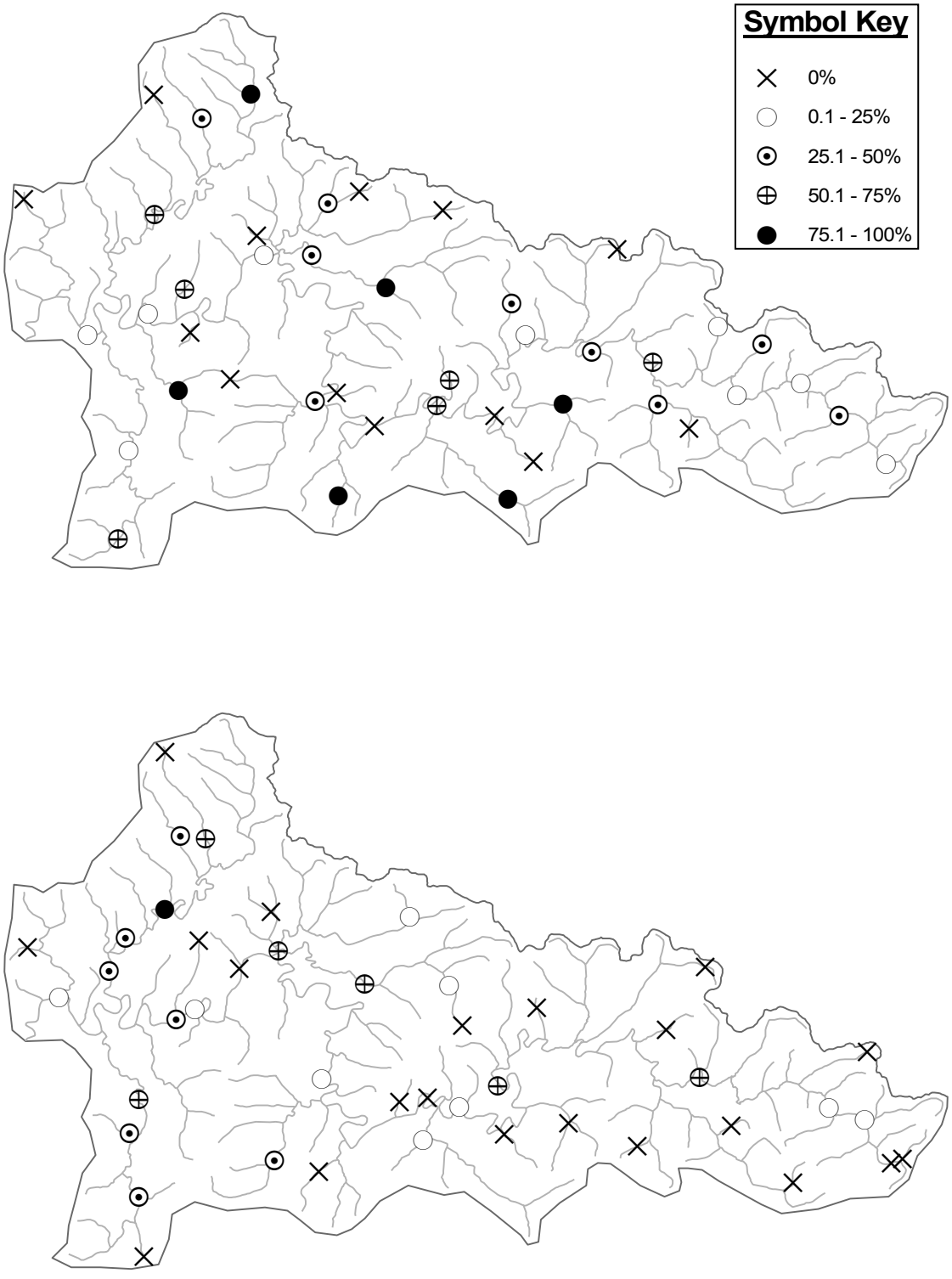
Appendix 6. 2. Number of pools snorkeled, fish observed, and density of juvenile coho, cutthroat and steelhead based on snorkel surveys in the Smith River basin, summer 2003. Bolded sites are non-wadeable sites in the mainstem Smith River. See Figure 49 for location of sample sites.

Site	N pools Snorkeled	Number of Fish Observed			Average Fish/m^2		
		Coho	Cutthroat ≥90 mm	Steelhead ≥90 mm	Coho	Cutthroat ≥90 mm	Steelhead ≥90 mm
219	20	20	10	3	0.1804	0.0082	0.0016
220	18	18	10	9	0.7349	0.0193	0.0159
224	1	1	0	1	0.5679	0.0000	0.0247
228	12	12	0	11	1.1514	0.0000	0.1738
230	15	13	8	10	0.0327	0.0018	0.0064
231	6	6	1	0	3.2227	0.0148	0.0000
232	13	13	7	2	0.7652	0.0099	0.0025
234	14	11	3	10	0.3690	0.0097	0.1420
235	5	5	4	4	1.4984	0.0511	0.0867
237	15	15	1	1	0.2823	0.0007	0.0028
238	16	16	6	0	0.8610	0.0290	0.0000
239	11	11	6	1	0.1929	0.0049	0.0014
242	16	16	8	0	1.3169	0.0172	0.0000
244	9	9	2	9	2.5878	0.0231	0.2235
245	14	13	3	3	0.1285	0.0011	0.0020
246	16	14	7	6	0.2905	0.0195	0.0184
247	33	33	13	6	0.9025	0.0140	0.0052
249	1	1	0	1	2.0000	0.0000	0.1111
251	18	18	6	3	0.2112	0.0038	0.0008
7000	22	18	0	3	0.0077	0.0000	0.0007
7400	24	18	13	0	0.0336	0.0042	0.0000
7500	21	18	7	5	0.0561	0.0013	0.0016
7900	15	4	2	4	0.0009	0.0007	0.0034
8300	15	9	1	1	0.0121	0.0001	0.0000
9100	9	3	0	0	0.0008	0.0000	0.0000
9400	9	7	5	4	0.0065	0.0010	0.0003
9500	6	0	1	0	0.0000	0.0000	0.0000
9900	19	13	1	3	0.0037	0.0001	0.0008

Appendix 7. 1. Spatial distribution of juvenile coho occurrence (percent of pools with at least one fish at each snorkeled site) in the Smith River, summers 2002 (top panel) and 2003 (bottom panel).



Appendix 7. 2. Spatial distribution of juvenile cutthroat (≥ 90 mm) occurrence (percent of pools with at least one fish at each snorkeled site) in the Smith River, summers 2002 (top panel) and 2003 (bottom panel).



Appendix 7. 3. Spatial distribution of juvenile steelhead (≥ 90 mm) occurrence (percent of pools with at least one fish at each snorkeled site) in the Smith River, summers 2002 (top panel) and 2003 (bottom panel).