

Siletz Basin Steelhead Trapping and Management Activities

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Background

The Siletz River basin is unique in the fact that it contains viable runs of seven species of anadromous fish (spring and fall Chinook salmon, coho salmon, chum salmon, summer and winter steelhead, and sea-run cutthroat trout). The Siletz is the only Coast Range basin in Oregon with a native run of summer steelhead.

It is thought that summer steelhead evolved in the Siletz River Basin because Siletz Falls (river mile 64.5) is only passable to anadromous fish during summer low flows. With the construction of a fish ladder around the falls in 1953 the basin was opened for the first time to anadromous fish species that migrate in the winter, thus eliminating the competitive advantage for summer steelhead. Wild Siletz summer steelhead returns had declined severely by the mid 1990's, prompting the Oregon Department of Fish and Wildlife (ODFW) Commission to approve major changes in fish management in the upper Siletz. Since 1994 species thought to compete with summer steelhead for rearing habitat have been prevented from accessing areas above the falls. The Siletz Falls adult capture facility is located in the fish ladder at Siletz Falls and is operated year-round to control fish passage to the upper Siletz River Basin. It is also used for monitoring purposes and to collect winter and summer steelhead hatchery brood stock and capture surplus hatchery steelhead so they do not spawn in natural production areas.

Objectives

The objectives of this project are to implement components of ODFW steelhead management activities within the Siletz Basin. Specific sub-objectives include: 1) Implementation of the Siletz wild summer steelhead recovery project. 2) Implementation of Siletz Basin hatchery programs for summer and winter steelhead intended to augment sport fisheries. 3) Monitoring of steelhead and other anadromous fish species.

All project objectives were accomplished. Major activities to accomplish objectives include year round operation of the Siletz Falls fish trapping facilities and seasonal operations of a fish trap at Palmer Creek, a Siletz basin tributary. Following capture in these traps, steelhead and other fish are handled in a variety of ways as specified in the Siletz Basin Fish Management Plan (ODFW, 1997) and other ODFW planning documents. Some fish were passed up stream; others were used for hatchery broodstock, given to foodshare, recycled downstream to provide additional opportunity for sport fisheries, or used for stream enrichment. Staffing to operate the Siletz and Palmer Creek fish traps is primarily a permanent Technician 1 employee funded by the Sport Fish Restoration Program (SFR) with assistance from volunteers and other ODFW staff. During the 2007 reporting period, all objectives were accomplished within the approved SFR budget.

This report summarizes results of these activities from October 1, 2006 through December 31, 2007. Although the annual SFR funding contract only runs through the end of September of each year, data is summarized through the month of December to provide complete run estimates for summer steelhead and spring Chinook.

Siletz Falls and Palmer Creek Trapping Results

The fish trap at Siletz Falls has been operated continuously since 1994 (Table 1), while the Palmer Creek fish trap has been in operation since 1998 (Table 2). A detailed account of adult salmonids captured at the Siletz Falls and Palmer Creek capture facility is available at the ODFW field office in Newport. The Siletz Falls fish trap is operated year round except for brief closure periods during extreme high water events. The Palmer Creek trap is operated from mid December through mid May of each year.

Table 1. Estimates of adult steelhead, Chinook salmon and coho salmon entering the Siletz Falls trap from 1994 through December 2007.

Year	Summer Steelhead		Winter Steelhead		Coho Salmon		Spring Chinook		Fall Chinook	
	Wild ¹	Hatchery ²	Wild ³	Hatchery ⁴	Wild ⁵	Hatchery ⁵	Wild ¹	Hatchery ⁵	Wild ⁵	Hatchery ⁵
1994	153	1565 (1402)	394	1028	20	2	37	0	0	0
1995	77	859 (750)	309	613	24	106	140	0	6	0
1996	118	1772 (1658)	169	254	9	30	448	0	19	0
1997	44	937 (824)	97	274	0	11	134	0	38	0
1998	223	2310 (1041)	211	223	5	7	86	0	0	0
1999	311	1737 (1011)	240	142	1	0	118	0	0	0
2000	419	1494	163	151	6	1	323	0	16	0
2001	554	1614	214	216	13	36	593	0	49	0
2002	727	2198	248	289	68	4	275	1	4	0
2003	892	4133	189	162	35	0	195	4	20	0
2004	514	4436	201	154	21	0	362	1	15	0
2005	481	1976	242	282	19	1	244	4	10	0
2006	562	2437	396	169	18	4	322	14	0	0
2007	327	1973	228	203	6	0	103	0	2	0

- ¹ All wild summer steelhead and spring Chinook were passed upstream of the trap. Mass marking of all spring Chinook hatchery smolt releases began around 2002. Prior non marked Chinook trapped are assumed wild.
- ² Some hatchery summer steelhead were passed upstream of the trap until year 2000 (in parentheses) and the remainder either planted in Olalla Reservoir, donated to foodshare programs, used for stream enrichment or marked with colored floy tag and released downstream to enhance the fishery.
- ³ Wild winter steelhead were used for hatchery broodstock or relocated downstream to Buck and Sunshine Creeks, or the mainstem Siletz.
- ⁴ Hatchery winter steelhead were either planted in Olalla Reservoir, donated to foodshare programs, used for stream enrichment or marked with a colored floy tag and released downstream to enhance the fishery.
- ⁵ Wild coho and fall Chinook were released below the trap or trucked to a suitable downstream tributary. Hatchery coho and Chinook are donated to foodshare programs or used for stream enrichment.

Table 2. Adult anadromous fish entering the Palmer Creek fish trap from 1998 through May 2007.

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Winter Steelhead-hatchery	157	131	19	74	882	198	179	251	100	287
Winter Steelhead-wild	4	4	2	1	8	15	1	0	3	2
Coho Salmon-wild	0	0	0	0	3	0	0	34	0	10
Coho Salmon-hatchery	0	0	0	0	0	1	0	0	0	0

Summer Steelhead

The Siletz Falls fish trap is used to control access into the wild summer steelhead management area in the upper Siletz Basin. The first summer steelhead of 2007 was trapped on May 9th. The total number of summer steelhead through December was 2300 with 327 (14%) of wild origin. Returns of wild summer steelhead in 2007 were again above the 1992-1997 average of 125 fish but below the 1969-1972 average of 712 fish (Figure 1). The peak migration was late June through mid August (Figure 2) with returns into December. This is relatively consistent with the preceding ten year monthly average. All wild summer steelhead were passed above the trap.

The primary age class of wild adult summer steelhead returning in 2007 was the third year of fish coming back from exclusively wild spawners in areas upstream from the falls. Adult returns prior to 2004, were composed of large numbers of hatchery as well as wild summer steelhead. The steady returns of wild spawners over the last few years is supportive to the Siletz Basin summer steelhead management efforts.

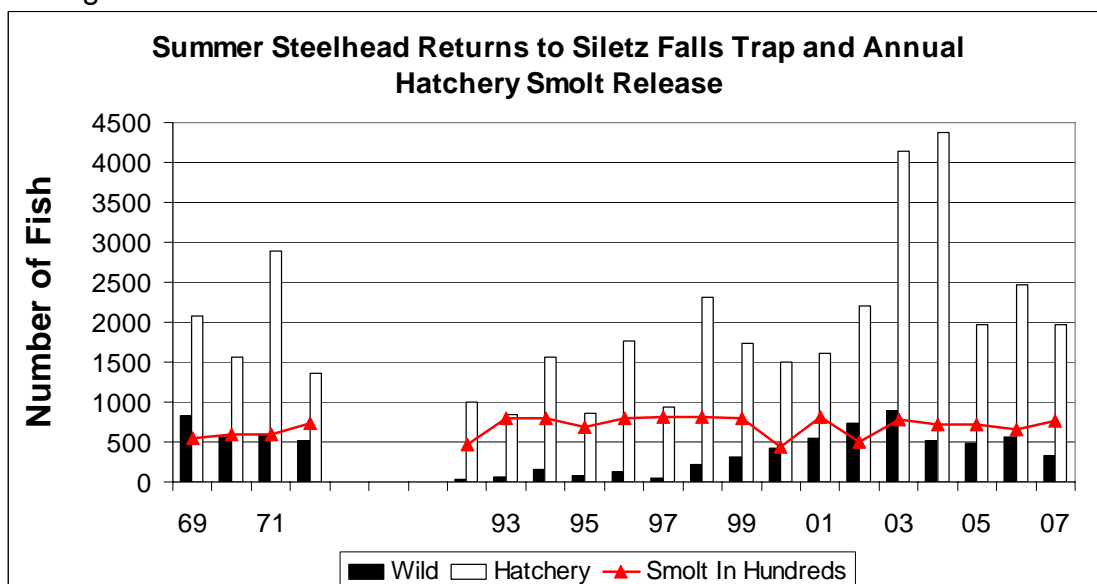


Figure 1. Summer steelhead captured at the Siletz Falls fish trap from 1969 through 2007 and annual hatchery smolt release.

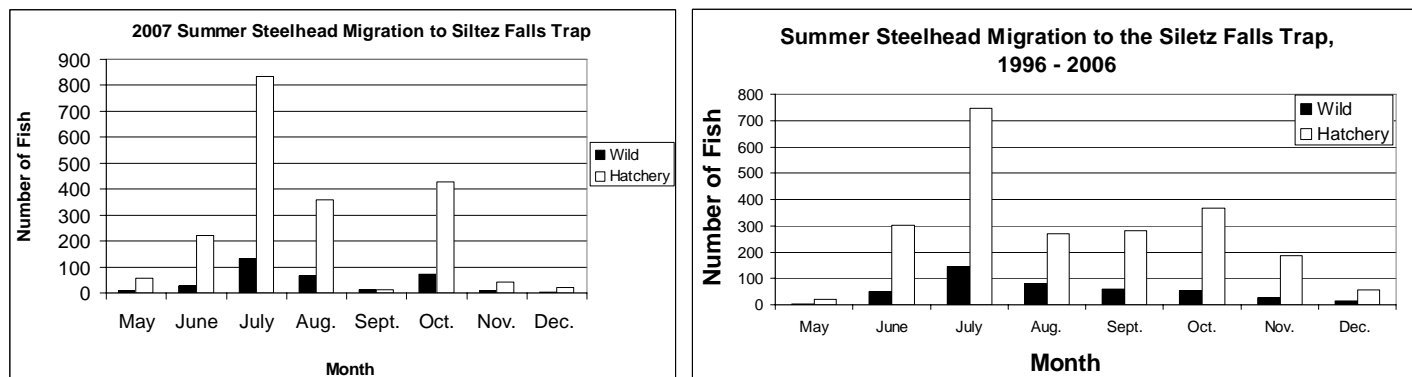


Figure 2. Migration timing of summer steelhead to the Siletz Falls Trap. The 2007 run timing (left) and preceding ten year monthly average (right).

A total of 1973 hatchery fish were collected of which 122 were transferred to Cedar Creek Hatchery to be used as brood stock to produce 80,000 smolts for stocking back into the Siletz Basin. Of the remaining hatchery fish, 1107 were donated to local food share programs, 215 were used for stream enrichment and 529 were recycled back into the local fishery, including Olalla Reservoir.

The summer steelhead hatchery program again provided for a productive sport fishery extending from June through October. The biggest component is the bank fishery from Moonshine Park upstream to the fishing deadline below Siletz Falls. There is also a drift boat fishery from Moonshine Park to tidewater when adequate river flows persist. This program has consistently produced good harvest rates for sports fisherman as represented by the most recent catch card estimates (Figure 3).

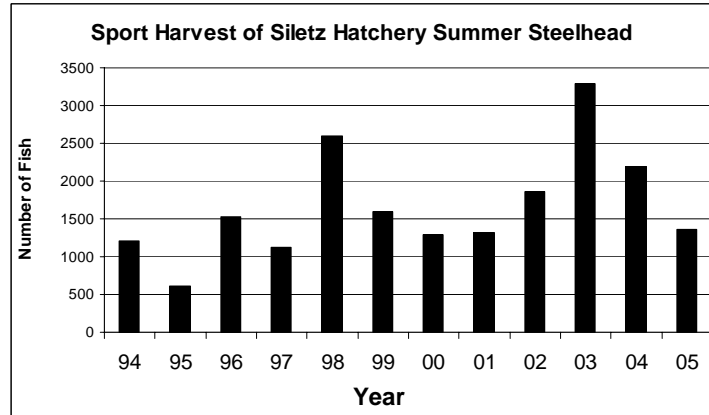


Figure 3. Sport harvest of Siletz hatchery summer steelhead from catch card estimates 1994 – 2005.

Recycled fish were marked with a floy tag at the Siletz Falls trap (RM 64.5) and released down river at Moonshine Park (RM 52.5) with the intent of increasing angler harvest. A total of 175 (37 %) of the recycled fish were accounted for, 152 recovered at the trap and 23 by anglers. No tagged fish were recovered at the ODFW monitoring trap in Mill Creek (RM 49) near Logsdan (Table 3). The reported catch by anglers is dependent on voluntary reports and thereby underestimates the actual total.

Table 3. Summer steelhead recycling summary.

Year	Siletz Falls Tagged	Siletz Falls Recovery	Angler Caught	Mill Cr. Siletz Recovery	Total % Recovery
2003	1242	179	12	2	16
2004	1589	232	34	5	17
2005	660	128	15	1	22
2006	775	133	23	5	20
2007	471	152	23	0	37

Winter Steelhead

Wild and hatchery winter steelhead are captured at the Siletz Falls, Palmer Creek and other basin traps. The total number of winter steelhead entering the Siletz Falls trap during the 2006-07 run was 431; 228 wild fish (53%) and 203 hatchery fish (47%) (Figure 4). The migration timing of wild and hatchery returns (Figure 5) was consistent with the migration trend over the previous 10 years. The trap was run continuously throughout the winter steelhead run except for 4 days when it was closed due to high water.

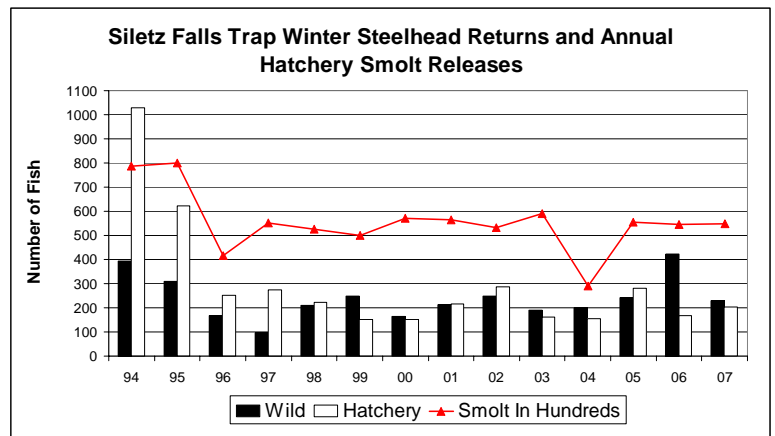


Figure 4. Winter steelhead captured at the Siletz Falls fish trap and annual hatchery smolt releases.

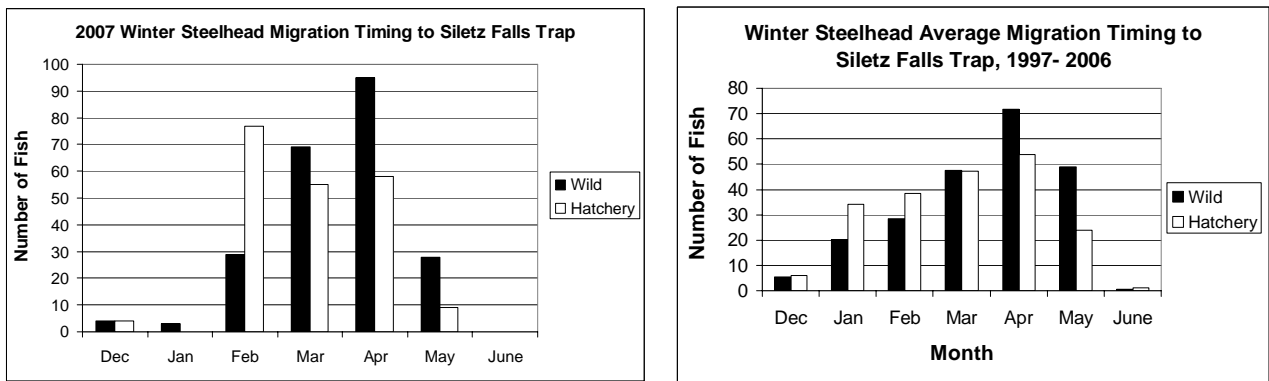


Figure 5. Migration timing of winter steelhead to the Siletz Falls Trap. The 2007 run timing (left) and preceding ten year monthly average (right).

Winter steelhead hatchery production for the Siletz Basin was derived by taking 78 wild winter steelhead from the Siletz Falls fish trap to Alsea Hatchery. These wild adult steelhead are used to produce approximately 50,000 smolts annually (Figure 4) for release into the Siletz Basin from the Palmer Creek acclimation facility. Prior to 1996, smolt releases were of the old Alsea River brood stock. All remaining wild winter steelhead captured at the Siletz Falls fish trap were released into the Siletz River or Siletz River tributaries including Buck, Elk and Sunshine Creeks.

The hatchery winter steelhead captured at the Siletz Falls fish trap are handled in several ways including: 1) Transported to Olalla Reservoir to provide for sport fisheries (0 fish because of reservoir conditions), 2) Donated to local foodshare programs (0 fish), 3) As carcasses used for stream enrichment (185 fish) or 4) Recycled downstream to contribute to Siletz River steelhead fisheries (18 fish). No winter steelhead were passed above the Siletz Falls trap.

At the Palmer Creek trap, 289 winter steelhead were captured during the 2006-07 run of which all but two wild fish were released as smolts from the acclimation site on Palmer Creek. In total, 575 adult steelhead were recovered in traps from the Palmer Creek hatchery smolt release (287 at Palmer Creek, 203 at Siletz Falls, and 85 at the ODFW monitoring trap in Mill Creek near Logsdan).

This was the fifth year that surplus hatchery winter steelhead have been recycled in the Siletz Basin (Table 4). The 236 tagged and recycled hatchery steelhead were initially captured at Siletz Falls or Palmer Creek traps (RM 52.5), marked with a floy tag and transported downstream to Illahee boat ramp (RM 41). A total of 4% of the tagged fish were recovered. No tagged fish were reported by an angler which is a voluntary basis and thereby underestimates the actual total.

Table 4. Winter steelhead recycling summary.

Year	Siletz Falls Tagged	Siletz Falls Recovery	Palmer Cr. Tagged	Palmer Cr. Recovery	Angler Caught	Mill Cr. Siletz Recovery	Total Tagged	Total % Recovery
2003	40	3	108	13	0	0	148	11
2004	29	1	162	15	3	1	191	10
2005	90	11	87	0	4	0	177	8.5
2006	26	0	72	2	0	0	98	2
2007	18	0	218	8	0	2	236	4

The Palmer Creek hatchery steelhead program provided for a good fishery during the 2006-07 run as indicated by angler reports, field investigations and trapping results. Drift boat anglers had good success during quality river conditions extending from Moonshine Park downstream to tidewater and bank anglers did well around Moonshine Park. Harvest is expected to be consistent with harvest card data back to 1998 which represents returns from the wild broodstock (Figure 6).

Hatchery Steelhead Spawning in the Wild

Hatchery summer and winter steelhead programs are managed to provide a recreational fishery while minimizing the incidence of hatchery fish spawning in natural habitats. Under the Siletz River Basin Fish Management Plan, hatchery steelhead spawning in the wild should be kept at 10% or less except in the immediate vicinity of the hatchery release site.

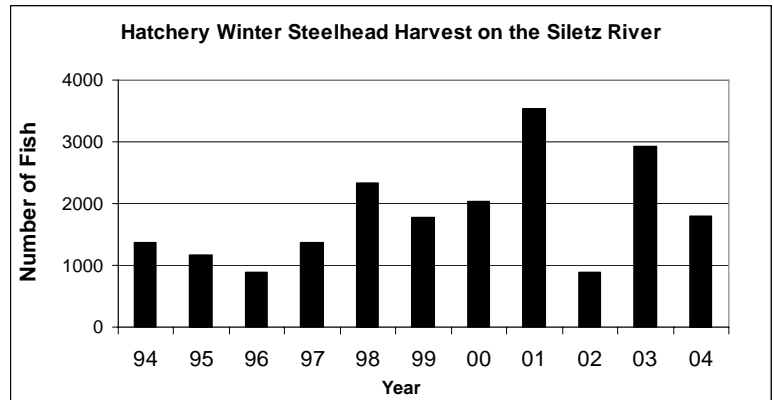


Figure 6. Sport harvest of Siletz hatchery winter steelhead from catch card estimates 1994 – 2004.

For the Siletz Basin there are two fish traps used to monitor wild to hatchery fish ratios. One is in Mill Creek located approximately 3.5 river miles below Palmer Creek (the release location of hatchery winter steelhead) near the town of Logsdan. The second trap is located near the north and south fork confluence of Schooner Creek which drains into Siletz Bay near Lincoln City. Both traps are operated from late fall through spring. Data collected at these sites has consistently indicated a higher abundance of hatchery fish in natural habitats than is desirable (Table 5). Results from the winter steelhead hatchery program indicate that a relatively small overall percent of returning adults are collected at the release site (Table 6).

Smolt releases for the summer steelhead hatchery program occur in the mainstem Siletz near Moonshine Park (RM 52.5) with the goal of collecting returning adults at the Siletz Falls trap (RM 64.5). Results from this program indicate a high trap recovery rate (Table 7). The higher trap recovery rate is likely related to different life history characteristics and trapping locations. The Siletz Falls trap location in the upper mainstem provides excellent attraction for fish, especially during the summer months when river conditions tend to be low and warm. In contrast, winter steelhead hatchery fish are recovered at lower rates. It is thought that Palmer Creek does not consistently have sufficient flows to draw fish into the trap except during higher water events.

Year	Mill Creek			Schooner Creek ¹		
	Wild	Hatchery	% Hatchery	Wild	Hatchery	% Hatchery
88				46	10	18
89				48	4	77
90				36	0	0
91				19	7	27
92				39	29	43
93				28	18	39
94				10	6	38
95				10	27	73
96				14	21	60
97				32	21	40
98	23	64	74	22	20	48
99	12	97	89	17	19	53
00	6	17	74	48	49	51
01	12	18	60	26	9	26
02	24	68	74	52	22	30
03	28	45	62	71	34	32
04	27	218	89	45	27	37
05	11	142	93	41	1	2
06	29	103	78	Not Operated		
07	13	118	90	19	15	44

(¹) Some years had inconsistent recording of specific mark types

Year	Sport Harvest ^{1,3}		Palmer Creek Recoveries		Siletz Falls Recoveries		Mill Creel Recoveries ²		Total Recoveries	
	Actual	Percent	Actual	Percent	Actual	Percent	Actual	Percent	Actual	Percent
94	1377	1.67%			1028	1.25%			2405	2.92%
95	1167	1.16%			624	0.62%			1791	1.78%
96	883	1.12%			252	0.32%			1135	1.44%
97	1365	1.71%			274	0.34%			1639	2.05%
98	2326	5.58%	157	0.38%	223	0.53%	34	0.08%	2740	6.57%
99	1785	3.24%	131	0.24%	153	0.28%	28	0.05%	2097	3.81%
00	2028	3.86%	19	0.04%	151	0.29%	4	0.01%	2202	4.19%
01	3544	7.07%	74	0.15%	216	0.43%	13	0.03%	3847	7.68%
02	888	1.56%	882	1.55%	287	0.50%	51	0.09%	2108	3.70%
03	2927	5.17%	198	0.35%	162	0.29%	6	0.01%	3293	5.82%
04	1800	3.3%	179	0.34%	154	0.29%	175	0.33%	508	4.26%
05	NA	NA	251	0.43%	301	0.51%	108	0.18%	660	1.12%
06	NA	NA	100	0.34%	169	0.58%	82	0.28%	351	1.21%
07	NA	NA	287	0.53%	203	0.37%	85	0.16%	575	1.06%

(¹) Sport harvest data is not currently available beyond 2004.
(²) Assumed all adm marked steelhead are from the Palmer Creek release.
(³) Percent of smolt released corresponding to 2 salt returns.

Table 7. Siletz Basin hatchery summer steelhead returns and sport harvest from corresponding smolt releases.

Year	Sport Harvest ^{1,3}		Siletz Falls Recoveries		Mill Creek Recoveries ²		Total Recoveries	
	Actual	Percent	Actual	Percent	Actual	Percent	Actual	Percent
92	1260	2.68%	994	2.11%			2254	4.10%
93	857	1.08%	841	1.06%			1698	2.16%
94	1024	1.29%	1565	1.97%			2589	3.43%
95	613	0.89%	859	1.24%			1472	1.99%
96	1740	2.18%	1772	2.22%			3512	4.09%
97	1191	1.47%	937	1.16%			2128	2.56%
98	2696	3.29%	2310	2.82%	29	0.04%	5035	6.03%
99	1344	1.68%	1737	2.20%	69	0.09%	3150	4.29%
00	1260	2.93%	1494	3.47%	11	0.03%	2765	6.47%
01	1277	1.58%	1614	1.98%	0	0.00%	2891	3.60%
02	1787	3.57%	2198	4.39%	15	0.03%	4000	8.10%
03	2068	2.65%	4133	5.27%	36	0.05%	6237	9.55%
04	2195	3.06%	4436	6.10%	44	0.06%	4480	9.22%
05	1369	1.90%	1976	2.74%	34	0.05%	2010	4.69%
06	NA	NA	2437	4.43%	21	0.04%	2458	4.47%
07	NA	NA	1973	2.7%	30	0.04%	2003	2.74%

(1) Sport harvest data is not currently available beyond 2005.
(2) Assumed all ad marked steelhead are from the Siletz River releases.
(3) Percent of smolt released corresponding to 2 salt returns.

Spring and Fall Chinook and Coho Salmon

For the 2007 spring Chinook return, 102 adults were captured at the Siletz Falls trap and passed upstream (Figure 8). This was well below the 1994-2006 average of 252. Spring Chinook started arriving at the trap in early June with the peak in July. This is relatively consistent with preceding runs (Figure 9). Major factors in the run timing are believed to be river temperature and flow. This is likely why there are often peaks in late summer or early fall when rains bring higher flows and cooler water temperatures.

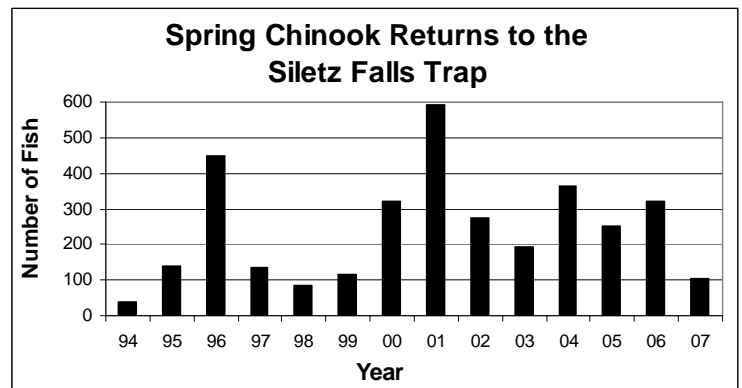


Figure 8. Spring Chinook returns to the Siletz Falls trap.

Returns of fall Chinook to the Siletz Falls trap are typically very low (Table 1). For 2007 two fall Chinook were trapped. These small returns to the trap are indicative to their run timing and typical river conditions. Many fall Chinook spawn in the lower to middle mainstem Siletz, especially when flows are lower and cool during the fall. They also spawn in many large and medium class tributaries below Siletz Falls when river flows allow accessibility from the mainstem.

Coho salmon returns to the Siletz trap are similar to fall Chinook with most years producing a low return. Most Siletz Basin coho spawn in small to medium size tributaries below the Siletz Falls. A total of six wild coho were captured at Siletz Falls through December 2007 (Table 1). These coho were tail punched and released immediately below the fish trap or trucked downstream and released in a suitable Siletz Basin tributary. There were no stray hatchery coho captured at the Siletz Falls Trap and no coho were passed above the falls.

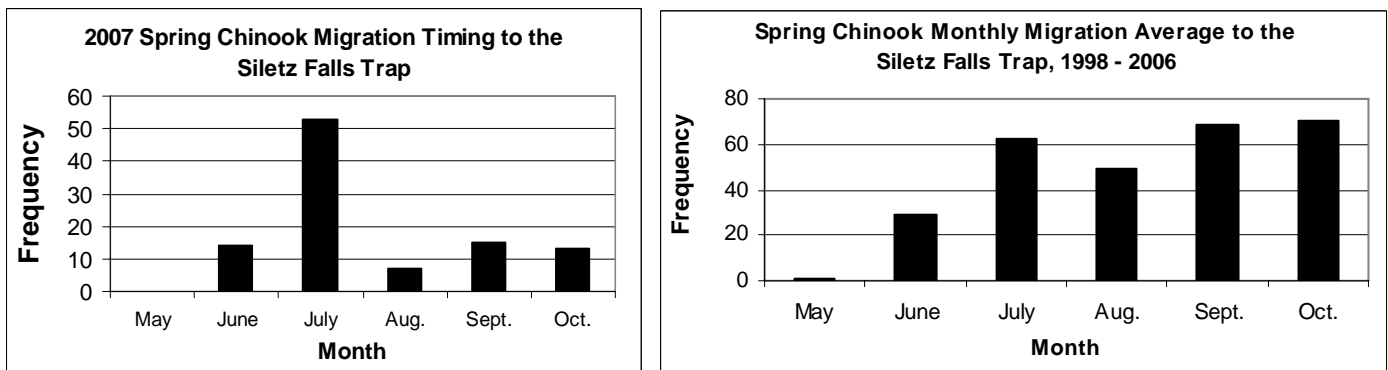


Figure 9. Migration timing of spring Chinook to the Siletz Falls Trap. The 2007 run timing (left) and preceding nine year monthly average (right).

References

Oregon Department of Fish and Wildlife. 1997. Siletz River Basin Fish Management Plan. Oregon Department of Fish and Wildlife, Salem, OR.