

**2000-2001 Horse Linto Creek Anadromous Monitoring Project**

**Funded by: SB-271  
California Department of Fish and Game  
Agreement #P0010554**

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Lower Trinity Ranger District  
November 2001**

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## Description

- CDF&G Agreement:** #P0010554
- Location of Work:** The map coordinates of the trap are T7N, R5E, Section 4. The trap can be accessed from the town of Willow Creek by taking Country Club Road north and turning left at Patterson road. Take road 8N03 to the Horse Linto campground. The trap site is located at the campground approximately 210 meters downstream of the Cedar Creek confluence and approximately 1650 meters upstream of the confluence with the Trinity River.
- Dates of Work:** Spawning surveys were conducted from the end of October through the end of January on Cedar and Horse Linto Creeks. The downstream migrant trap was operating from March 27, 2001 to July 25, 2001. The report writing took place in October and November.
- Hours:** Over 2,000 hours were spent on spawning surveys, downstream migrant trapping, and report writing.
- Costs:** CDF&G will be billed \$10,554.12 for the work completed to date. Extra costs are covered by the USFS.
- Project Objectives:** This project provides a way to monitor past restoration work in the watershed including the Horse Linto Creek Hatchery. Spawning surveys and downstream migrant trapping help evaluate the habitat quality and success of salmonids in Horse Linto Creek.

## Executive Summary

This report contains two related but separate salmonid monitoring techniques: fall salmon spawner surveys and spring /summer downstream migrant (DSM) trapping. Conducting both monitoring projects is possible in part by a grant from California Department of Fish and Game (CDF&G). Other contributors include the United States Forest Service (USFS) and AmeriCorps Watershed Stewards Project. Both monitoring projects provide critical information on the health of the anadromous salmonid populations in Horse Linto Creek.

Spawning surveys were conducted from the end of October 2000 through the end of January 2001 on Horse Linto and Cedar creeks. A total of 222 redds and 21 chinook carcasses were observed in fourteen survey days. Total redds in 2001 were above the average of 132 redds from the last ten survey years (calculated using season totals from 1991 to present).

The DSM trap caught 35,955 chinook, the highest number since the start of the DSM trapping project. The final estimate of chinook outmigration for 2001 is 85,362 juveniles which is greater than previous years. Chinook emigration peaked in May this year when 8,454 were caught in a 7-day period. The trap was closed at the end of July due to low numbers of chinook captures and low flows. A majority of the chinook had already outmigrated by this time.

The record numbers of chinook smolts are probably most due to an above average redd count coupled with higher survival rates of the eggs due to the mild winter and improving habitat conditions. Both the increased redd numbers and survival, were probably aided by the instream LWD (large woody debris) structures that have been added to Horse Linto Creek to improve habitat for salmonids.

Steelhead 1+ numbers in 2001 were higher than in all previous trapping years. A total of 1,704 1+ steelhead were caught in the 2001 trapping season. Steelhead young-of-the-year (YOY) numbers were down from the previous five years. The decrease in YOY steelhead is probably due to a short-term decrease in spawners, but this situation is expected to be reversed in a few years, since Horse Linto 1+ steelhead have benefited from a fishing closure. Steelhead 1+ numbers indicate survival to outmigrant size. 1+ numbers are a better indicator than YOY of how many fish might survive long enough to return as adults and spawn. So, most importantly, a total of 1,704 1+ steelhead were caught in the 2001 trapping season, up from the 1,363 in 2000 and well above 1994 to 1999 which averaged only 579 fish. Steelhead 1+ emigration peaked in May.

The closure to fishing on Horse Linto by CDF&G may be a reason for the increase in 1+ steelhead numbers. The increase of outmigrants seen to start in 2000 followed shortly behind the 1999 closure of the stream to fishing. The addition of natural woody debris in Horse Linto Creek could also increase the number of 1+ steelhead by increasing available cover and carrying capacity.

Willow Creek is the nearest tributary to Horse Linto Creek, which has both chinook and steelhead. Willow Creek had similar results to those in Horse Linto Creek with a high number of redds

and record chinook smolt migration. Willow Creek had a record number of YOY and 1+ steelhead this year, as well.

The coho data from our 2001 trapping provides a mixed message about the local coho population: It is encouraging that the DSM trapping continues to discover YOY coho on both Willow and Horse Linto Creeks. A total of 57 coho were caught in the Willow Creek trap and the Horse Linto Creek trap caught 14. However, the abundance is admittedly low and does not provide any indication that more than about one pair of coho spawns in each stream per year.

**2000-01 SALMON SPAWNING REPORT  
HORSE LINTO CREEK WATERSHED  
LOWER TRINITY RANGER DISTRICT  
SIX RIVERS NATIONAL FOREST**

**2/8/01**

**Prepared By: Colin Anderson**

**Abstract**

Spawning surveys were conducted from October 24, 2000 through January 24, 2001 on Horse Linto and Cedar Creeks. Chinook salmon (*Oncorhynchus tshawytscha*) was the only species of anadromous fish observed in these creeks this season. A total of 222 redds and 21 carcasses were observed in the Horse Linto Watershed. A population of 499 adult chinook was estimated using the recommended California Department of Fish and Game (CDF&G) expansion of 2.25 fish per redd. Scales were collected from 17 carcasses for age analysis.

**Watershed Overview**

Horse Linto Creek is a fifth order tributary of the Trinity River located in Humboldt County, California. The mouth of Horse Linto is located at 41°00'06" north latitude and 123°37'01" west longitude, with a legal description of T.7N, R.5E, Section 4r on the U.S.G.S. Tish Tang Point 7 ½ minute quadrangle. Horse Linto Watershed drains approximately 186 square kilometers of the Klamath Mountains. The headwaters have an elevation of 1,896 meters and drain into the Trinity River at an elevation of 91 meters. Cedar Creek, a fourth order stream, is the largest tributary of Horse Linto Creek (Figure 1). The mouth of Cedar creek is located at 41°00'24" north latitude and 123°36'14" west longitude, with a legal description of T.7N, R.5E, Section 3. Horse Linto Watershed is composed of private land, Six Rivers National Forest (SRNF), and Hoopa tribal lands.

Restoration in the Horse Linto Watershed began in 1978. Stream habitat restoration has included boulder deflectors, boulder clusters, cobble gabions, and large woody debris structures to improve spawning and rearing for anadromous salmonids. Stabilization of a large landslide and tree planting projects were also used as restoration tools. In 1981 and 1982 SRNF operated hatch boxes on Horse Linto incubating chinook, coho, and steelhead eggs from the Lewiston Trinity River hatchery. From 1985 through 1994, a fall chinook salmon hatchery was in operation on Horse Linto Creek. The hatchery was a cooperative effort between CDF&G, Pacific Coast Federation of Fisherman's Association, and SRNF. The last release of chinook (1993 brood stock) was in 1994. Five-year-old fish from the last release returned in fall and winter of 1998. The hatchery has been discontinued in order to evaluate the long-term benefit to the naturally spawning population.

## Materials and Methods

Spawning surveys were conducted from late October 2000 through late January 2001 on Cedar and Horse Linto Creeks (Appendix A). Six Rivers Fisheries technicians and AmeriCorps Watershed Stewards Project members were the primary surveyors. Survey methods closely follow those found in California Salmonid Stream Habitat Restoration Manual (CDF&G, January 1998). Carcasses were marked by punching both of the operculum with a paper hole punch.

Horse Linto Watershed contains three survey reaches. Reaches are marked every 100 feet from the mouth to the end of the survey reach. Survey reaches include: Horse Linto Extended (0-4,500 ft.), Horse Linto Index (4,500-14,600 ft.), and Cedar Creek (0-15,000 ft.). Surveys were conducted weekly when possible (Appendix A). Survey reach lengths were determined by past spawning activity within the watershed. Survey season and stream reach has remained relatively constant over the last ten years, however the survey effort has varied from three to fourteen survey days for each survey reach from 1991 to 2000 (Appendix B).

Fish habitat has been augmented in many places to mimic natural spawning sites; redds found in an artificially influenced site were recorded as artificial, whereas redds found where no augmentation has occurred were said to be natural. Numbers of live fish were recorded for informational purposes only, as an indicator of fish activity. Scales were collected from retrieved carcasses whenever the physical state of the tissue allowed. Scales were sent to the Yurok Tribal Fisheries Program and the United States Fish and Wildlife Service for age analysis.

## Results and Discussion

### Chinook

A total of 222 redds were observed in the Horse Linto Watershed in 2000 (Table 1 & Appendix C). This is the third highest number of redds observed when compared to spawning surveys since 1991 (Appendix B & C). Approximately 39% of redds in the watershed were located near artificially influenced sites. The percentage of artificial redd sites in each reach were: Cedar Creek 38%, Horse Linto Extended 68%, and Horse Linto Index 32%. Using the CDF&G recommended expansion of 2.25 fish per redd, the total adult chinook escapement in the Horse Linto Watershed was calculated as 499 fish. Survey crews found no carcasses that possessed hatchery fin clips or marks during the 2000 season.

**Table 1. 2000-2001 Horse Linto Watershed spawning survey totals for Chinook Salmon.**

CREEK	LIVE FISH*	CARCASSES				REDDS		
		F	M	U	TOTAL	NAT	ART	TOTAL
Cedar	29	1	0	0	1	50	30	80
HL Extended	53	5	2	0	7	11	23	34
HL Index	317	12	1	0	13	73	35	108

\*Live fish numbers should not be viewed as an accurate population indicator as individual fish may be counted several times.



Horse Linto Watershed redds were above the 10-year mean of 168 (Appendix B). Willow Creek redds were also above the 10 year mean. Lewiston hatchery received record numbers of chinook adults this year. Other creeks surveyed in the Lower Trinity had close to record numbers of chinook. Horse Linto watershed followed this year's trend with the third highest number of chinook recorded (Appendix B). This year had the highest number of redds since returns from the Horse Linto hatchery program ceased. No chinook with hatchery marks were recovered in Willow or Horse Linto creeks this season. Carcass recovery related to number of redds was low in Willow Creek and even lower in Horse Linto.

Increased predator activity was probably responsible for the low number of carcasses recovered this survey season (Appendix C). Predator fishing success on both pre and post-spawn fish was probably increased by the relatively low flows and clear water conditions. Bear scat and scavenged carcasses were commonly noted, as well as bear sightings on upper Horse Linto and Cedar Creeks. Surveyors noted relatively few post-spawn female chinook attending redds, which again indicates predator harvest.

Two surveys were done on each reach outside of the usual time period with the following results. Cedar Creek had two redds counted in two surveys on January 18, and 23, 2001. Horse Linto Extended had one redd counted in two surveys on January 16, and 25, 2001. Horse Linto Index reach had 3 redds counted in two surveys on January 18, and 23, 2001. Data from the extra two weeks were included due to the later start of the fall run when compared to previous years data. The late run may be due to the low flows this survey year when compared to previous years. Data from these two extra weeks did not change the yearly totals drastically. This year's low flows and exceptionally good water clarity enabled surveyors to better document the spawning in the watershed.

High numbers of redds counted in the survey reaches of Horse Linto and Cedar creeks may be a result of the low flows. Chinook probably had insufficient flows to favor spawning higher in the watersheds outside of the indexed reaches and concentrated the spawning in the lower parts of the reaches. Also, low water may have influenced the fish into spawning by the structures in the lower watershed. A majority of the structure work in Cedar Creek is located in the lower portion of the reach. This season, the chinook took greater advantage of the spawning habitat created by the structures. A larger portion of redds in Cedar Creek in 2000 were noted as Artificial when compared to past seasons (Appendix B).

***Editor's note:** The spawning report was finalized in February before DSM trapping was started, so the following paragraph was a valid discussion then, but subsequent DSM trapping located many juvenile salmon. Conversely, slightly below average numbers of chinook redds in 1994, yielded extremely low numbers of juveniles due to scouring flooding in the winter/spring of 1995.*

Although a high number of redds were counted, the resultant juvenile salmon production is still in question. As noted above, fewer fish may have spawned above the survey reaches than in past years. Also, spawning activity occurred at very low flows compared to past years and therefore redds were not spread as diversely throughout the habitat as would occur with varying flow stages. Winter and spring scouring of redds constructed at low flow may lower juvenile salmon outmigrant production.

Superimposed redds were noted, but the incidence were relatively low, compared to some past years. Spawning activity was generally spread out along the length of available habitat, even though it

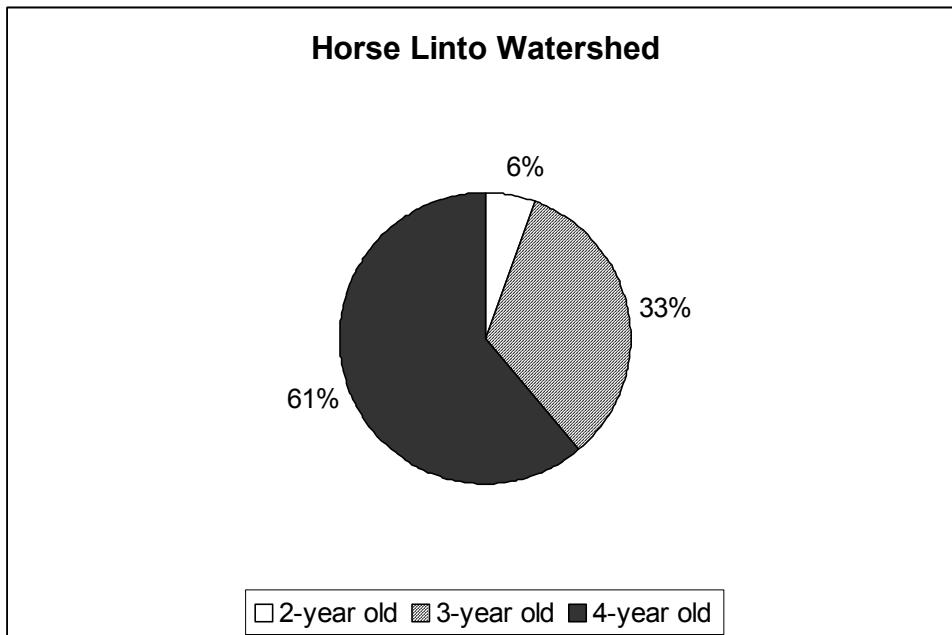
wasn't well spread across the width of the stream due to low flows. Superimposition may lower juvenile salmon out migrant production this year.

It should be noted that we believe that superimposition is generally declining due to increasing habitat complexity from both project work and natural recovery. As noted earlier, 39% of the Horse Linto Creek spawning was associated with project work. The addition of large woody debris (LWD) appears to be much more attractive to the spawners in the last few years than boulder structures lacking natural or project LWD.

The superimposition that did occur had several causes: Typically as the flows increase in the fall and winter, the later run of fish spawn in different locations than the early run. Low flows through the end of spawner season gave chinook fewer spawning locations. The extended run allowed later returning females to spawn in the same places as early spawners, who were not present to defend their redds. Bear predation on post spawn chinook females would have further amplified this effect.

Scales were collected from 17 chinook carcasses in Horse Linto Creek. The scales were analyzed by the Yurok Tribal Fisheries Program and the U.S. Fish and Wildlife Service, Arcata office. The age class components were calculated as a percentage of the total scale samples from Horse Linto Creek. It should be noted that the sample size of 17 is fairly small when trying to estimate the relative abundance of three age classes of the estimated 499 spawners. Resultant age classes are shown in Figure 1. The Horse Linto Creek run was composed mainly of 4-year olds followed by 3-year olds and a few 2-year olds. No 5-year olds were sampled.

Figure 1. 2000-01 Horse Linto Watershed age class percentages as calculated from scale samples.



## **Coho**

In the past, coho salmon (*Oncorhynchus kisutch*) have been observed in the watershed; however, no adults were observed in the 2000 spawner survey season. Past coho spawning has been documented in both Horse Linto and Cedar Creeks (Appendix B 1997, 1998). Coho juveniles have been captured in the downstream migrant trap in seven out of ten years of trapping. Coho spawning activity may have occurred this year after the spawning surveys were completed.

## **General Observations**

This spawner survey season was the second after the Megram fire, which occurred in the summer/fall of 1999. Severe burning took place in the upper riparian zones and headwaters of the Horse Linto Watershed. Increased sediment input and resulting turbidity is therefore a concern, but has not been noticeable to date in the anadromous surveys. Throughout the season, water visibility was near 100% at all flows and never affected survey accuracy in any of the reaches. An instrument measuring turbidity, stage height and temperature was placed in Horse Linto Creek at station 51+20 in the fall of 1999. Data from this station could provide information relevant to the spawning survey data and give insight on the possible future effects of the Megram fire.

## **Recommendations**

- Spawner surveys should be continued on Horse Linto and Cedar Creeks. Quality data from 1991 to the present along with future data is very beneficial for management purposes allowing managers to monitor the self-sustaining population of chinook salmon in the watershed.
- Analyze data collected from the stream station on Horse Linto Creek to determine the possible effects of the Megram fire on the stream ecosystem.
- Identify and treat chronic sediment sources in the watershed to reduce point-source input.
- Update a 1995 structure inventory in Horse Linto and Cedar creeks.
- Review spawning data related to instream enhancement projects to identify attributes of successful work and where any additional work might be needed.
- Prepare a report on what we've learned in Horse Linto about instream enhancement from our monitoring to illustrate both successes and room for improvement.

**Appendix A. 2001-2001 Survey Summaries for Horse Linto Watershed Lower Trinity Ranger District.**

**Cedar Creek**

<b>REACH (ft)</b>	<b>DATE</b>	<b>LIVE FISH</b>	<b>CARCASSES</b>	<b>REDDS</b>
0 - 15000	10/26/00	0	0	0
0 - 15000	11/2/00	0	0	2
0 - 15000	11/7/00	1	0	6
0 - 15000	11/15/00	2	0	1
0 - 15000	11/21/00	0	0	1
0 - 15000	11/29/00	10	0	9
0 - 15000	12/5/00	4	0	24
0 - 15000	12/12/00	4	0	7
0 - 15000	12/20/00	5	1	17
0 - 15000	1/3/01	2	0	10
0 - 15000	1/9/01	1	0	1
0 - 15000	1/18/01	0	0	1
0 - 15000	1/23/01	0	0	1
<b>Totals</b>	<b>13 Survey Days</b>	<b>29</b>	<b>1</b>	<b>80</b>

**Horse Linto Creek Extended**

<b>REACH (ft)</b>	<b>DATE</b>	<b>LIVE FISH</b>	<b>CARCASSES</b>	<b>REDDS</b>
0 - 4500	10/24/00	0	0	0
0 - 4500	10/31/00	1	0	0
0 - 4500	11/8/00	0	0	0
0 - 4500	11/16/00	2	0	0
0 - 4500	11/21/00	0	0	1
0 - 4500	12/1/00	20	0	11
0 - 4500	12/6/00	14	1	9
0 - 4500	12/14/00	7	3	3
0 - 4500	12/19/00	7	0	2
0 - 4500	12/28/00	0	1	2
0 - 4500	1/04/01	2	0	2
0 - 4500	1/10/01	0	2	3
0 - 4500	1/16/01	0	0	0
0 - 4500	1/25/01	0	0	1
<b>Totals</b>	<b>14 Survey Days</b>	<b>53</b>	<b>7</b>	<b>34</b>

**Appendix A Continued. 2000-01 Spawning survey Summaries for Horse Linto Watershed Lower Trinity Ranger District.**

**Horse Linto Creek Index**

<b>REACH (ft)</b>	<b>DATE</b>	<b>LIVE FISH</b>	<b>CARCASSES</b>	<b>REDDS</b>
4500 - 14600	10/25/00	1	1	4
4500 - 14600	10/31/00	5	0	3
4500 - 14600	11/8/00	3	0	4
4500 - 14600	11/16/00	3	0	3
4500 - 14600	11/20/00	4	0	0
4500 - 14600	11/28/00	53	0	26
4500 - 14600	12/5/00	104	1	30
4500 - 14600	12/14/00	71	2	10
4500 - 14600	12/19/00	46	3	6
4500 - 14600	12/28/00	17	3	9
4500 - 14600	1/3/01	6	3	5
4500 - 14600	1/08/01	3	0	5
4500 - 14600	1/18/1	0	0	3
4500 - 14600	1/23/01	1	0	0
<b>Totals</b>	<b>14 Survey Days</b>	<b>317</b>	<b>13</b>	<b>108</b>

**Appendix B. Spawning Survey Totals from 1991 to 2000 for Horse Linto Watershed on the Lower Trinity Ranger District.**

**Horse Linto Index Reach**

<b>Year</b>	<b>SURVEY DAYS</b>	<b>LIVE FISH</b>	<b>CARCASSES</b>	<b>REDDS</b>		<b>TOTAL REDDS</b>
				<b>NAT</b>	<b>ART</b>	
1991	4	25	7	8	7	15
1992	8	91	2	51	27	78
1993	8	32	9	14	14	28
1994	8	117	27	12	38	50
1995	5	176	9	45	22	67
1996	8	197	17	44	64	108
1997	10	129	82	70/1*	26	96/1*
1998	8	28	4	22	8	30
1999	9	91	13	38	3	41
2000	14	317	13	73	35	108
<b>MEAN</b>	<b>8</b>	<b>120</b>	<b>18</b>	<b>38</b>	<b>24</b>	<b>62</b>

\*Coho salmon

**Appendix B Continued. Spawning Survey Totals from 1991 to 2000 for Horse Linto Watershed Lower Trinity Ranger District.**

**Horse Linto Extended Reach**

Year	SURVEY DAYS	LIVE FISH	CARCASSES	REDDS		TOTAL REDDS
				NAT	ART	
1991	3	32	12	3	27	30
1992	8	21	5	16	40	56
1993	6	19	3	20	9	29
1994	9	70	21	23	16	39
1995	6	128	15	11	34	45
1996	6	57	27	9	47	56
1997	10	29	8	22	11	33
1998	8	28	13	18	5	23
1999	10	22	5	11	1	12
2000	14	53	7	11	23	34
<b>MEAN</b>	<b>8</b>	<b>46</b>	<b>12</b>	<b>15</b>	<b>21</b>	<b>36</b>

**Cedar Creek Reach**

Year	SURVEY DAYS	LIVE FISH	CARCASSES	REDDS		TOTAL REDDS
				NAT	ART	
1991	4	42	5	25	2	27
1992	4	56	14	54	11	65
1993	9	22	2	16	7	23
1994	10	28	8	11	3	14
1995	6	99	5	35	8	43
1996	7	131	14	70	29	99
1997	10	336	138	235	16	251
1998	7	57/2*	20	34/2*	2/2*	36/4*
1999	9	97	6	48	15	63
2000	13	29	1	50	30	80
<b>MEAN</b>	<b>8</b>	<b>90</b>	<b>21</b>	<b>58</b>	<b>12</b>	<b>70</b>

\*Coho Salmon

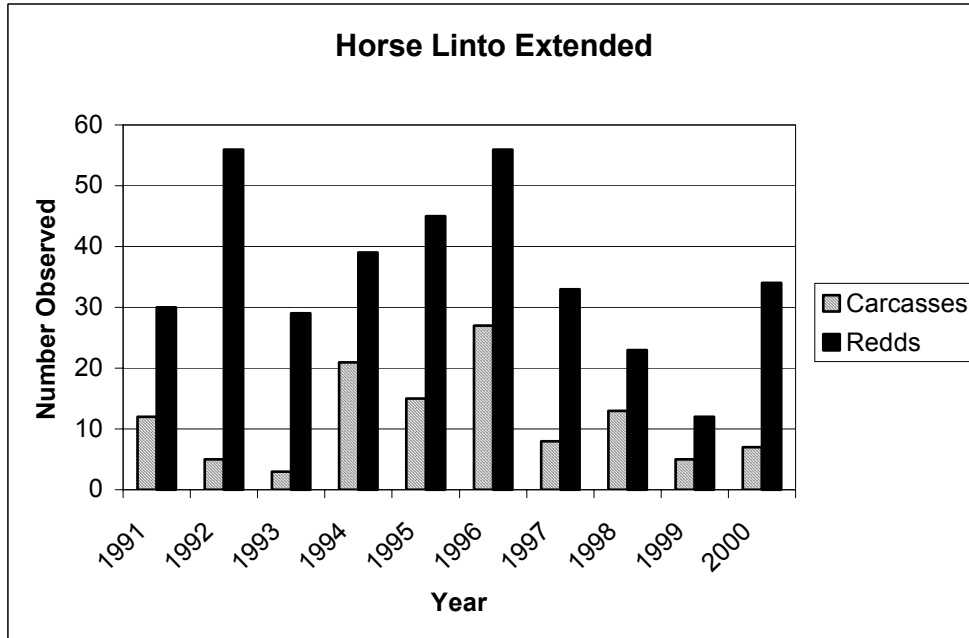
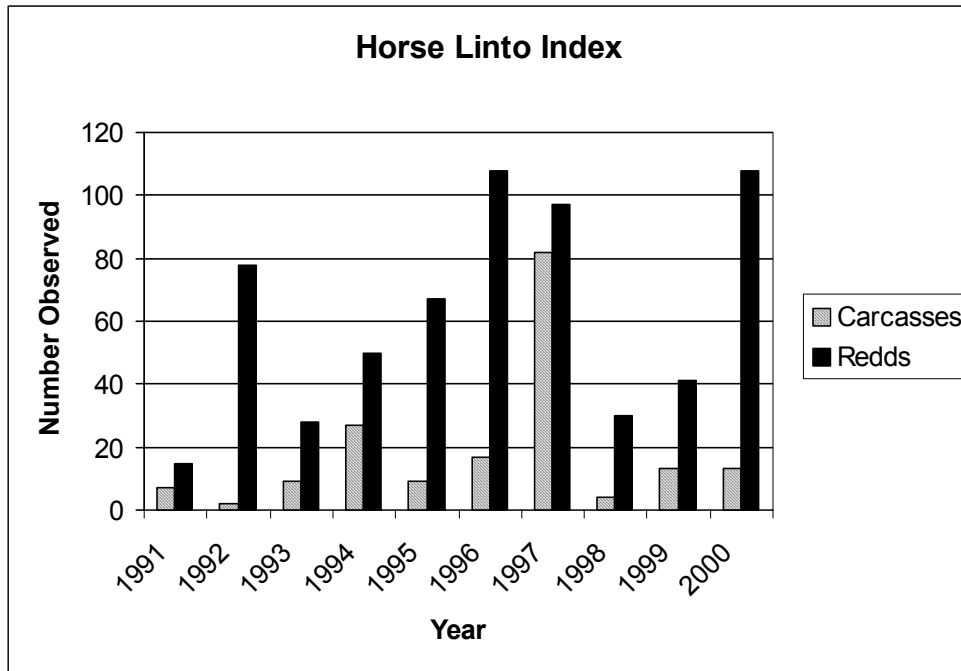
**Appendix B Continued. Spawning Survey Totals from 1991-2000 for Horse Linto Watershed Lower Trinity Ranger District.**

**All Reaches In Horse Linto Watershed**

Year	SURVEY DAYS	LIVE FISH	CARCASSES	REDDS		TOTAL REDDS
				NAT	ART	
1991	11	99	24	36	36	72
1992	20	168	21	121	78	199
1993	23	73	14	50	30	80
1994	27	215	56	46	57	103
1995	17	403	29	91	64	155
1996	21	385	58	123	140	263
1997	30	494	228	327/1*	53	380/1*
1998	23	113/2*	37	74/2*	15/2*	89/4*
1999	28	210	24	97	19	116
2000	41	399	21	134	88	222
<b>MEAN</b>	<b>24</b>	<b>256</b>	<b>51</b>	<b>110</b>	<b>58</b>	<b>168</b>

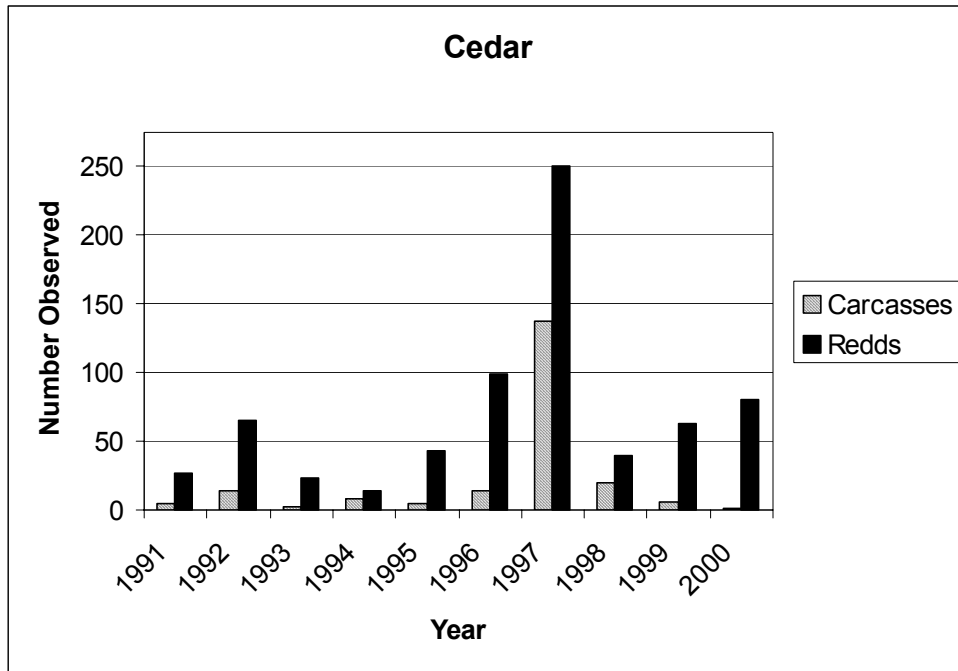
\*Coho salmon

**Appendix C. Spawning Survey Totals from 1991 to 2000 for Horse Linto Watershed Lower Trinity Ranger District.**





**Appendix C Continued. Spawning Survey Totals from 1991 to 2000 for Horse Linto Watershed Lower Trinity Ranger District.**



**Appendix map. Horse Linto spawning survey reach.**

## **2001 Downstream Migrant Trapping Report**

### **Horse Linto Creek Lower Trinity Ranger District Six Rivers National Forest**

**October 2001**

**Prepared By: Heidi Peura**

#### **Abstract**

On March 27, 2001 installation and yearly operation of a downstream migrant trap (DSM) began on Horse Linto Creek. The trap operated from March 27, 2001 through July 25, 2001 and was open for 118 days.

A total of 35,955 chinook salmon (*Oncorhynchus tshawytscha*), 14 coho salmon (*O. kisutch*) and 4,880 steelhead (*O. mykiss*) were captured. Steelhead year class totals were 2,993 YOY (young of the year), and 1,704 were 1+ (one year old or older). The overall catch per unit effort, or CPUE (number of fish captured per trapping day) was 304.7 for chinook, and 41.36 for steelhead. Other fish species caught in the trap were 1,121 dace (*Rhinichthys spp.*), 110 sculpin (*Cottus spp.*), 36 lamprey (*Entosphenus spp.*), 1 brown trout (*Salmo trutta*), and 15 suckers (*Catostomus spp.*).

An expanded population estimate, using mark and recapture efficiencies, of total out-migration during the period of trapping was 85,362 for chinook and 7,263 for 1+ steelhead. Chinook YOY, and steelhead 1+ numbers in 2001 were higher than in all previous trapping years. Steelhead YOY numbers in 2001 were lower than numbers in 1996-2000 but higher than 1994-1995.

#### **Introduction**

On March 27, 2001, a downstream migrant fish trap was placed in Horse Linto Creek for the eleventh consecutive year to monitor the out-migration of juvenile salmon and steelhead. Pipe traps were used to monitor fish migration on Horse Linto Creek from 1991 through 1993 to little effect, while in 1994 through 2001, a rotary screw trap was used.

Horse Linto Creek is a fifth order tributary of the Trinity River located in Humboldt County, California. The mouth of Horse Linto is located at 41°00'06" north latitude and 123°37'01" west longitude, with a legal description of T.7N, R.5E, Section four on the U.S.G.S. Tish Tang Point 7 ½

minute quadrangle (Figure 1). Horse Linto Watershed drains approximately 186 square kilometers of the Klamath Mountains. The headwaters have an elevation of 1,896 meters and drain into the Trinity River at an elevation of 91 meters. Horse Linto has about 14 miles of salmon and steelhead habitat. Horse Linto Watershed is composed of private land, Six Rivers National Forest (SRNF), and Hoopa tribal lands.

Restoration in the Horse Linto Watershed began in 1978. More than \$1,000,000 has been invested in in-stream and upslope restoration projects within the Horse Linto watershed.<sup>1</sup> More than 200 in-stream habitat improvement structures have been constructed including boulder deflectors, boulder clusters, gabion basket weirs, and large woody debris structures to improve spawning and rearing habitat for anadromous salmonids.

Stabilization of a large landslide and tree planting projects were also used as restoration tools. In 1981 and 1982 SRNF operated hatch boxes on Horse Linto Creek, incubating chinook, coho, and steelhead eggs from the Lewiston Trinity River hatchery. From 1985 through 1994, a fall chinook salmon hatchery was in operation on Horse Linto Creek. Native Horse Linto chinook broodstock were used. The hatchery was a cooperative effort between California Department of Fish & Game (CDF&G), Pacific Coast Federation of Fisherman's Association, and SRNF. The hatchery has been discontinued in order to evaluate the long-term benefit to the naturally spawning population.

The effectiveness of the salmonid restoration in Horse Linto has been monitored through a variety of methods. During the past eleven field seasons, 1990 through 2000, regular weekly spawner surveys were conducted within Horse Linto Creek and Cedar Creek from October through January as flows allowed. Spawner surveys and DSM trapping provide an annual index of the production of chinook salmon, coho salmon and steelhead. Horse Linto monitoring projects provide an indication of the effectiveness of the previously noted habitat improvement work and chinook-rearing project.

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<sup>1</sup> Dollar amount does not include Megram fire restoration.

**Figure 1. Horse Linto Creek downstream migrant trap site.**

## Materials and Method

A rotary screw fish trap manufactured by E. G. Solutions, Inc. was used in 2001. The trap is powered by water entering a 1.5-meter diameter cone. Moving water enters the perforated cone and impinges upon an internal auger screw assembly causing the cone to turn. Fish entering the cone are forced into and retained in a live box. Mop heads were placed into the live box to reduce predation of smaller fish. The cone can be elevated out of the water when it's not in use.

The trap site is located at the Horse Linto campground, approximately 210 meters downstream from the Cedar Creek confluence and approximately 1,650 meters upstream of the Horse Linto confluence with the Trinity River (Figure 1). The trap was placed in the thalweg of the creek, except when high flows prevented it.

Fish were counted seven days a week when the weather permitted, and personnel were available to operate the trap. The cone was raised in windy and stormy conditions to prevent debris from accumulating in the trap. For the days during which the trap was closed, an estimated capture was calculated by averaging the previous four days' catch, and the following four days' catch. These numbers were added to the totals of fish actually caught to calculate the estimated capture during trap closure period.

Fish were recorded by grouping each species into size classes. The size classifications of fork lengths of fish started at <40 mm, then were recorded in increments of 10 mm, e.g., 41-50, 51-60, and 61-70 etc., up to >160 mm. When there were more than 10 fish of the same species and size, they would be scooped into a pan and a subset measured. For example, 10 fish estimated to be in the <40 mm class size would be grouped together and two of them measured. The data collector would then enter 10 fish in the <40 mm class. All of the fish with fork lengths greater than 100 mm were measured individually. Larger fish and amphibians were placed in separate buckets than the YOY's to reduce potential predation while working up the fish. Amphibians were recorded by species and measured from snout to vent.

Counted fish and amphibians were immediately returned to the creek unless they were to be used for mark and recapture to measure trap efficiency. Larger potential predator fish and smaller fish were released in separate spots. Fish used to test trapping efficiency were taken approximately 400 meters upstream in buckets and dyed with Bismark Brown Y dye. Two grams of dye were used per 25 gallons of water. Fish were recounted, placed in the dye solution for approximately 20 minutes, transferred to a screened recovery bucket in the river for one hour, and released. The dye was effective for a maximum of three or four days. The dyed fish that were recaptured were used for gauging the efficiency of the trap. Chinook over 50mm were used for the mark and recapture tests. Only 1+ steelhead were used for efficiency testing. Smaller chinook and steelhead were not used to limit mortalities. Mark and recapture tests were done when sufficient numbers of fish were trapped. Trap efficiency was calculated as the percentage of the dyed fish that were trapped again. To determine the expanded population estimate, the total chinook or 1+ steelhead caught that week was added to the estimated capture for the days, the trap

was closed; that number was divided by the trap efficiency mean, for each species, after the weeks mark and recaptures were completed.

Separating juvenile steelhead into 1+ and 2+ classes can be problematic due to differential growth rates, but separating YOY from 1+ was possible. Steelhead with fork lengths 51 mm and longer were called 1+ and older in March and April. Steelhead with fork lengths 61 mm and longer were called 1+ and older through May and the first week in June. Steelhead with fork lengths 71 mm and longer were called 1+ for the rest of the trapping season.

Mortalities were divided into old and fresh categories. Old mortalities were fish that showed body decomposition. Fresh mortalities were fish thought to have died in the trapping process. Only fresh mortalities were used to generate trapping mortality percentages.

## Results

The downstream migrant trap was installed in Horse Linto Creek and operating by March 27, 2001. Fish were counted from March 27, 2001 through July 25, 2001 for a total of 118 trapping days. For 5 days during the trapping period the cone was raised due to weather conditions; these were on March 31, April 1, April 29, May 2, and July 12.

## Chinook

A total of 35,955 chinook were caught during the 2001 trapping season (Table 1). The estimated number of fish that might have been caught on the days the trap was closed, added to the actual fish caught was 36,481 chinook during the trapping season.

**Table 1. Horse Linto Creek Downstream Migrant Trap Totals.**

	1994**	1995	1996	1997	1998	1999	2000	2001
<b>Caught</b>								
Chin	3521	113	4018	4812	9821	12165	19060	35955
Sthd All	3036	1606	6863	7077	4977	12470	8584	4880
1+ Sthd	962	94	754	367	616	480	1363	1704
Coho	42	0	2	4	0	1	12	14
<b>Estimated + Caught</b>								
Chin*			4661	7625	13925	13686	21230	36481
Mean efficiency	33.85%*		33.67%	33.72%	34.30%	35.52%	38.28%	42.60%
Sthd 1+*								1784
Mean Efficiency	38.37%*							24.56%
<b>Expanded</b>								
Chin	10558		13843	22613	40598	51602	55463	85362
1+ Steelhead	2507						7212	7263

\* Includes estimates from days trap was closed.

\*\* An error was found and corrected in the 1994 report regarding trap efficiency and total 1+ steelhead caught.

Nine mark and recapture tests were done with chinook to determine the trap efficiencies (Table 2). Trap efficiency results varied slightly throughout the season, yielding a mean of 42.60% for chinook. Chinook mark and recapture tests were performed from May 13 through July 15. Most chinook (94%) were recaptured the following day, while some were recaptured up to three days after marking. Using the trap efficiency data, and estimated captures for when the trap was closed, 85,362 chinook were projected to have outmigrated during the trapping period (Table 2). More chinook were trapped this season in Horse Linto Creek than in any previous year (Table 1).

The CPUE for the season was 304.7 chinook per day (Table 3). The weekly peak (week when the most chinook were caught in the trap) occurred during the week of May 6 through May 12 (Figure 2). A total of 8,454 chinook were caught during that week. The CPUE for that week was 1,207.71 chinook. The highest number of chinook caught on any one day was May 15, when 2647 were captured (Appendix B).

**Table 2. Expanded Chinook Population Data – 2001.**

Dates	Week	Total Weekly Capture Chinook	Estimates Added In	Number Chinook Marked	Number Chinook Recaptured	Trap Efficiency	Expanded Population Estimate Chinook*
3/27-3/31	1	29	43				101.00
4/1-4/7	2	168	168				394.00
4/8-4/14	3	245	245				575.00
4/15-4/21	4	252	252				592.00
4/22-4/28	5	662	792				1859.00
4/29-5/5	6	2128	2342				5497.00
5/6-5/12	7	9170	9170				21525.00
5/13-5/19	8	7468	7468	121	44	0.3636	17530.00
5/20-5/29	9	3407	3407	121	41	0.3388	7997.00
5/27-6/2	10	2988	2988	95	34	0.3579	7014.00
6/3-6/9	11	2202	2202	305	107	0.3508	5169.00
6/10-6/16	12	1818	1818	354	160	0.4520	4267.00
6/17-6/23	13	1799	1799	119	75	0.6303	4223.00
6/24-6/30	14	1813	1813	300	149	0.4967	4256.00
7/1-7/7	15	790	790	85	38	0.4471	1854.00
7/8-7/14	16	688	856				2009.00
7/15-7/21	17	258	258	68	20	0.2941	606.00
7/22-7/28	18	70	70				164.00
<b>Totals</b>		<b>35955</b>	<b>36481</b>	<b>1568</b>	<b>668</b>	<b>0.4260</b>	<b>85632.00</b>

\*Used the mean trap efficiency for the entire trapping season.

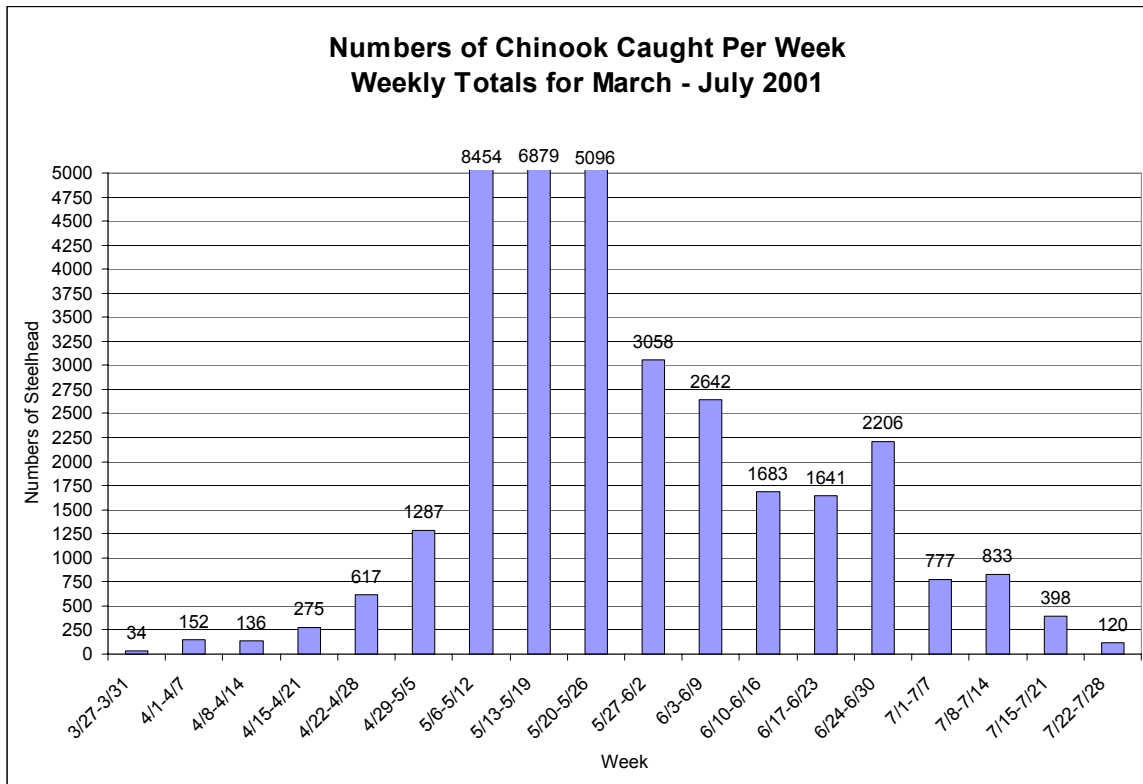


**Table 3. Horse Linto Creek trap CPUE (Catch Per Unit Effort).**

CPUE	1994	1995	1996	1997	1998	1999	2000	2001
Chin	32.22	2.17	53.57	69.74	86.91	102.22	171.71	304.7
Sthd All	28.64	30.88	91.51	102.57	44.04	104.78	77.33	41.36

A total of 327 out of 35,955 chinook perished as a result of the trapping process, giving a 0.10% mortality rate for the entire trapping period. The highest mortalities occurred on May 15, when 232 fish perished due to high flows causing debris to accumulate in the trap.

**Figure 2. Weekly Totals of Chinook captured in Horse Linto Creek.**



### Steelhead

A total of 4,880 steelhead were captured during the 2001 trapping season (Table 1). Of those, 1,704 steelhead were in the 1+ and older age class and 3,176 were in the YOY age class. The estimated number of fish that might have been caught on the days the trap was closed added to the actual fish caught was 3,435 YOY and 1,784 1+ steelhead.

Four steelhead mark and recapture tests were done, producing a mean trapping efficiency of 24.56%. Only 1+ steelhead were used for the efficiency tests. Steelhead mark and recapture tests occurred from April 17, through May 16, 2001. Most (88%) steelhead recaptures occurred the following day, while some were recaptured up to three days after marking. Using the trap efficiency data and estimated captures for when the trap was closed, the expanded number of 1+ steelhead projected to have out migrated during the trapping period is 7,263 (Table 4).

CPUE for the season was 41.36 steelhead per day (Table 3). The weekly peak of YOY occurred during the week of July 15 through July 21 (Figure 3). 671 steelhead were caught in the trap that week. Steelhead CPUE for peak migration was 28.3 fish per day. The highest numbers of steelhead caught on any one day was July 14, when 159 steelhead were caught in the trap (Appendix H). The weekly peak for 1+ steelhead occurred during the week of May 13 through May 19 (Figure 4), when 338 1+ steelhead were caught.

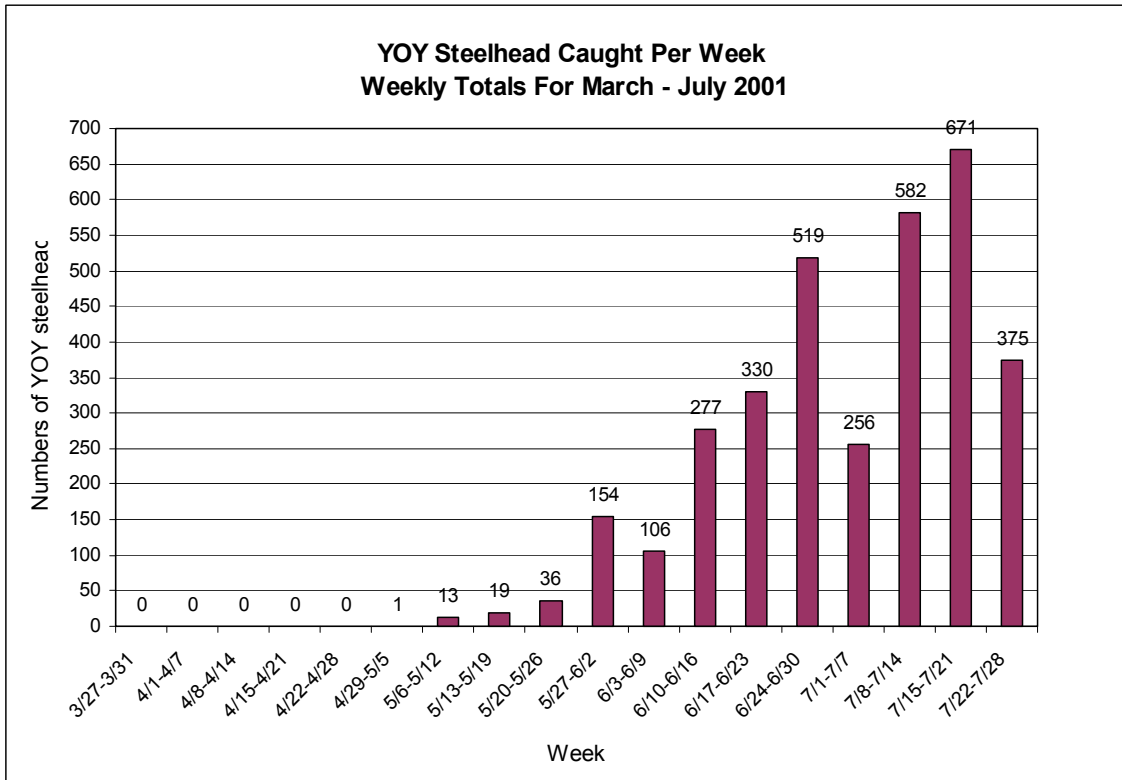
**Table 4. Expanded 1+ Steelhead Population Data**

Dates	Week	Total Weekly Capture 1+ Steelhead	Total With Estimates Added In	Number Steelhead Marked	Number Steelhead Recaptured	Trap Efficiency	Expanded Population Estimate*
3/27-3/31	1	81	94				383
4/1-4/7	2	33	46				187
4/8-4/14	3	18	18				73
4/15-4/21	4	137	137	72	21	0.2917	558
4/22-4/28	5	229	229	27	7	0.2593	932
4/29-5/5	6	89	141				574
5/6-5/12	7	296	296	69	16	0.2319	1205
5/13-5/19	8	338	338	109	24	0.2201835	1376
5/20-5/29	9	116	116				472
5/27-6/2	10	71	71				289
6/3-6/9	11	86	86				350
6/10-6/16	12	86	86				350
6/17-6/23	13	54	54				220
6/24-6/30	14	25	25				102
7/1-7/7	15	21	21				86
7/8-7/14	16	5	7				29
7/15-7/21	17	13	13				53
7/22-7/28	18	6	6				24
<b>Totals</b>		<b>1704</b>	<b>1784</b>	<b>277</b>	<b>68</b>	<b>0.2456</b>	<b>7263</b>

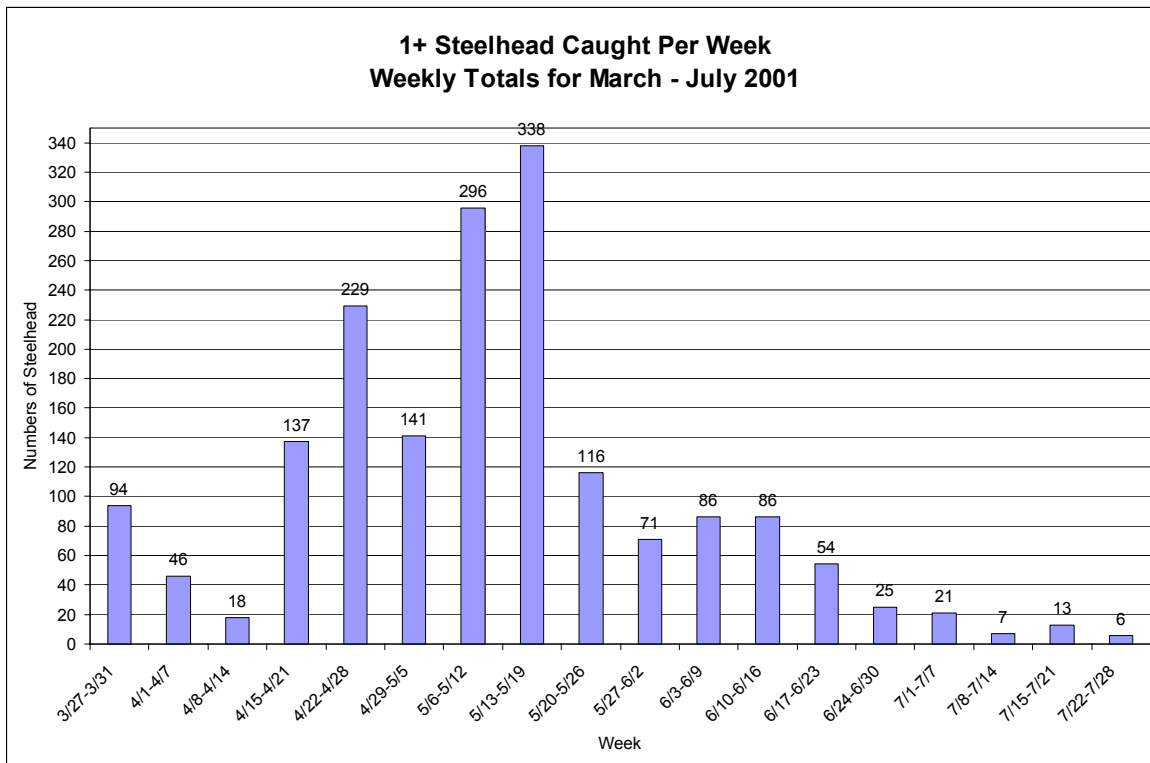
\*Used the mean trap efficiency for the entire trapping season.

The seasons CPUE for the 1+ and older size class was 14.4 steelhead per day. A total of 47 out of 4880 fish perished due to the trapping process, producing a 0.10% mortality rate for the entire season. Mortalities were YOY fish only.

**Figure 3. Weekly total of YOY Steelhead captured in Horse Linto Creek trap.**



**Figure 4. Weekly totals of 1+ Steelhead captured in Horse Linto Creek trap.**



## Coho

Fourteen coho salmon were trapped this year in the Horse Linto Creek trap, and ranged in size from 35 – 70mm. Coho were trapped in April, June and July. No 1+ coho were trapped this season.

## Miscellaneous Species

Total numbers of non-salmonid fish caught included 1,121 dace, 110 sculpin, 36 pacific lamprey, and 15 suckers. Amphibian species caught included tailed frogs (*Ascaphus truei*), pacific tree frogs (*Pseudacris regilla*), western toads (*Bufo boreas*), rough skinned newts (*Taricha granulosa*) and pacific giant salamanders (*Dicamptodon tenebrosus*). One brown trout (*Salmo trutta*) was also caught in the trap this year.

## Discussion

The purpose of downstream migrant trapping is to monitor the effectiveness of in-stream restoration projects in increasing salmon production and to compare the relationship between redd counts, past DSM production, and subsequent adult return. DSM trapping continues to be the best way to monitor the production of chinook and steelhead. DSM trapping should be a long-term program in order to compare annual variation in production. Reducing the mortality rates while trapping is also a concern. After the Megram fire in the summer and fall of 1999, monitoring the Horse Linto salmonid populations should continue, to discover the possible effects of the fire on the fisheries.

Increases in chinook redds do not always result in increases in chinook juveniles (Tables 1 & 5), and conversely, lower numbers of redds counted does not mean that there will be fewer fish in the trap the following year. Redds counted in the 2000 spawning season were lower than in 1996 and 1997 (Table 5), while numbers of chinook caught in the trap in 2001 were higher than in those previous years (Table1). Many different factors could be responsible for high survivorship in relation to redds that were counted. The number one reason is the yearly variation in storm intensity and bed load movement effecting the emergence numbers.

**Table 5. Horse Linto Creek Watershed Spawning surveys.**

Creek	Number of Redds Counted							
	1993	1994	1995	1996	1997	1998	1999	2000
Horse Linto Index	28	50	67	108	96	30	41	108
Cedar Creek	23	14	43	99	251	40	63	80
Totals*	51	64	110	207	347	70	104	188

\*Horse Linto extended reach lies below the DSM trap. Chinook from redds in that reach are not captured in the trap and are therefore not included in this discussion about DSM juveniles.

The number of chinook captured this year was higher than in any previous year's trapping (Table 1). Chinook mark and recapture efficiency this season is similar to past years, but slightly higher. Trap efficiency varied from 29% to 63% with a mean of 42.60% (Table 2). CPUE was also higher than in

years past (Table 3). With both higher numbers of chinook and greater CPUE, Horse Linto continues to show an upward trend in juvenile production. Adult escapement and redd numbers have not increased over the last few years. It is possible that better spawning habitat and rearing habitat are responsible for the upward trend in juvenile production. The addition of instream LWD structures have played a larger and larger role in improving spawning and rearing habitat as the years pass. Spawners are encountering better habitat and LWD helps protect eggs and intragravel fry from predators and currents. Also, trapping conditions were favorable this year due to low flows that could be fished effectively throughout the chinook out migration period. These lower flows also probably increased trap efficiency.

Record numbers of 1+ steelhead were captured in Horse Linto this year (Table 1). As with chinook, it is guessed that the improved spawning and rearing habitat has increased the numbers. A greater amount of natural large woody debris is present in Horse Linto Creek than in the past 5-20 years providing cover and increasing carrying capacity. The closure of Horse Linto to fishing may also contribute to the higher numbers of 1+ steelhead. The increase in outmigrants can be seen in 2000 following the 1999 closure of the stream to fishing. The low numbers of YOY steelhead is probably due to a short-term decrease in spawners this year and is not expected to last. The 1+ steelhead are a better indicator than the YOY steelhead of how many fish might survive long enough to return as adults and spawn. A total of 1,704 1+ steelhead were caught in the 2001 trapping season, up from 1,363 in 2000 and well above 1994 to 1999 which averaged only 546 fish.

It is understood that a number of steelhead emigrated before the trap was installed; however according to the data obtained, this number would appear small, since steelhead outmigration was comparatively low in late March and early April. Additionally, trapping has been conducted in the same general window, as flows allow, so comparison between years is valid, even if the total production of 1+ is undoubtedly somewhat higher.

Mark and recapture weeks were determined by when sufficient numbers of fish were caught in the trap. Trap efficiencies were generated for nine weeks for chinook and four weeks for steelhead. Efficiency numbers were not generated for the whole trapping season as not enough fish were trapped to perform mark and recapture efforts. This year, steelhead mark and recapture efforts were attempted with sample sizes ranging from 27 to 109 fish. Trap efficiency varied from 22% to 29% with a mean of 24.56% (Table 4). Low recapture percentages may be due to a variety of reasons. Small mark and recapture sample sizes may generate skewed recapture efficiencies. Steelhead marked which were not smolting may not have gone downstream in the following three or four days causing the low recapture numbers. Early in the trapping season when mark and recapture tests are being conducted with 1+ steelhead, flows are generally higher than when mark and recapture tests are being done on chinook. These higher flows reduce the effectiveness of the trap, thus yielding a smaller trapping efficiency for the 1+ steelhead than for the chinook. Another possibility to explain the variations of trapping efficiency between the chinook and 1+ steelhead is that larger 1+ may be better able to avoid being captured by the trap.

Trap mortalities seem to be most associated with storms and when high numbers of YOY and larger predators are found in the live box at the same time. Salmonid mortalities were all YOY chinook and steelhead. When storms cause water levels to rise quickly, large amounts of detritus are picked up by the trap at a much faster rate than the debris screen is capable of removing. On May 15, the live box was filled with leaves which caused high mortality numbers. Size of debris is an issue as well. The

debris screen will only carry away leaves and small woody debris; large debris can build up and crush the fish in the live box. Sticks and debris that accompany a sudden high water event can pile up in the cone and clog the entrance. On two separate occasions, June 10 and 16, a large branch was lodged in the trap's cone. Mortalities for chinook were 42% and 70% respectively (Appendix C), a result of the wedged branches. After removing the branches the trap mortalities for chinook dropped to 0% and 1.36% the following days. Steelhead mortalities for June 10 and 16 were 85% and 93% respectively. Mortalities dropped to 0% and 0.07% the following days. During trapping, it is important to continue monitoring the weather to anticipate when the wind or storms will cause the trap to become filled with debris, and close the trap. On July 12 the trap was closed due to a flash flood warning preventing mortalities.

Predation within the trap by larger 1+ steelhead and sculpin was a concern this season. Predation in the holding box does occur but it is not known to what extent. Mop heads placed in the holding box for cover provide some refuge for smaller fish, but are insufficient on the days with peak numbers of YOY's. The livewell and cover structures are too small to hide thousands of YOY's from predators inside the livewell. In past seasons, it has been noted that larger fish were observed having full bellies and regurgitating YOY chinook and steelhead. We did not observe this problem this season. Some biologists have suggested emptying the live well more than once per day. Unfortunately we find that most of the migration is taking place during the night and it is not feasible for trappers to work in the dark. Emptying traps in the morning and maintaining cover in the live well until the 1+ steelhead are removed helps limit predation.

In the summer and fall of 1999 the Megram fire burned 64% of the riparian habitat in Horse Linto watershed. Most of the burned area was in the non-anadromous headwaters. Possible effects from the fire include water temperature changes, elevated turbidity levels, increased sediment loads, and changes in peak flows. There is great concern of the possible influences the fires may have on salmonid populations and habitat. Possible effects may take years to impact the salmonid populations. To date, sediment movement and stream temperatures in the anadromous habitat have not been noticeably affected by the fire. A strong flush of ash was noticed in January 2000, but it did not apparently harm salmonids in Horse Linto.

## **Recommendations**

Install the trap as early as possible, ideally by the end of March, with trapping to begin as close to the beginning of April as stream flows will permit. When storm events occur during the trapping season, the trap should be monitored carefully and the cone should be elevated out of the water when the stream carries more debris than the trap screen can remove.

Mark and recapture efficiency tests need to be conducted frequently, at least once a week, or anytime that a significant change in fish numbers is noted; assuming adequate numbers of fish are available. Aggregate lesser numbers of chinook or steelhead over a few days trapping to conduct more mark and recapture tests. Continue using chinook that are 50 mm and larger for marking, in order to generate more weeks of mark and recapture efficiencies. Leaving the trap open seven days a week makes it feasible to conduct additional mark and recapture tests generating more valid population estimates. Use only 1+ steelhead that are smolting for the mark and recapture portion of monitoring.

Consider using a four-week rotating caudal fin clip for smolting steelhead to allow a longer recapture period than with the dye.

In order to reduce potential predation in the traps by larger fish, the traps should be monitored early in the morning when large numbers of 1+ steelhead and chinook are mixed in the holding box. Ensuring that adequate cover is available in the live box is critical, additional mop heads should be used to allow segregation of smaller fish. Consider using small-screened boxes to attract small YOY fish in the holding box.

Continue DSM trapping to monitor possible effects of the Megram fire on the salmonid populations in Horse Linto.

2000-2001 Horse Linto Anadromous Monitoring Report - Lower Trinity Ranger District, SRNF  
2001 Downstream Migrant Trapping Report

**Appendix A: Chinook captured March and April 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																		
0.00% percent mortalities for the month of March																		
Chinook																		
Date	Forklength (mm)														Total Chinook	Comments	fresh mortalities	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160				
3/27/01	1															1		
3/28/01	9		1													10		
3/29/01	6															6		
3/30/01	10															10		
3/31/01																	trap closed	
<b>Totals</b>	<b>26</b>		<b>1</b>													<b>27</b>		<b>0</b>
<b>Total estimated chinook = 34</b>																		
Horse Linto - Downstream Migrant Trap Data 2001																		
0.00% percent mortalities for the month of April																		
Chinook																		
Date	Forklength (mm)														Total Chinook	Comments	fresh mortalities	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160				
4/1/01																	trap closed	
4/2/01	2															2		
4/3/01	4															4		
4/4/01	17	2														19		
4/5/01	2	2														4		
4/6/01	109	4														113		1
4/7/01	9	1														10		
4/8/01	5	1														6		
4/9/01	12															12		
4/10/01	6	1														7		
4/11/01	17	1														18		
4/12/01	25	3														28		
4/13/01	38															38		
4/14/01	26	1														27		1
4/15/01	112															112		2
4/16/01	8	5	2													15		
4/17/01	57		1													58		
4/18/01	37		5													42		
4/19/01	15	3	2													20		
4/20/01	15	9	2													26		
4/21/01	1	1														2		
4/22/01	53															53		
4/23/01	22	26	3													51		
4/24/01	83	2	8													93		1
4/25/01	65	3	4													72		1
4/26/01	92	4	9													105		
4/27/01	149	3	5													157		1
4/28/01	82	2	2													86		
4/29/01																	trap closed	
4/30/01	103	43	4													149		
<b>Totals</b>	<b>1166</b>	<b>117</b>	<b>47</b>													<b>1329</b>		<b>7</b>
<b>Total estimated chinook = 1459</b>																		



2000-2001 Horse Linto Chinook Spawning Report - Lower Trinity Ranger District, SRNF  
 2001 Downstream Migrant Trapping Report

**Appendix B. Chinook captured in May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																		
0.10% mortalities for the month of May																		
Chinook																		
Date	Forklength (mm)														Total	Comments	fresh mortalities	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Chinook			
5/1/01	126	13	4												143		1	
5/2/01																trap closed		
5/3/01	83	75	3												161		2	
5/4/01	82	78	4	1											165		2	
5/5/01	380	65	5	7											457			
5/6/01	357	40	7												404		2	
5/7/01	225	561	8	1					3						798	3 yearlings		
5/8/01	1925	55	20												2000		4	
5/9/01	951	41	16	1											1009		2	
5/10/01	1077	43	28	2					1						1151	1 yearling		
5/11/01	1096	415	60	9					2						1582			
5/12/01	922	503	71	13				1							1510			
5/13/01	178	161	47	7	1										394			
5/14/01	1424	58	40	2											1524			
5/15/01	733	1782	128	4											2647	lots of debris	232	
5/16/01	177	152	42	28	2										401		4	
5/17/01	176	193	34	31											434		1	
5/18/01	392	387	69	36											884			
5/19/01	268	250	42	34	1										595		1	
5/20/01	473	451	105	96	1										1126			
5/21/01	819	485	73	4											1381			
5/22/01	358	293	54	3											708			
5/23/01	323	328	40	32											723		2	
5/24/01	112	154	67	68	1										402		1	
5/25/01	78	130	72	16											296			
5/26/01	76	284	68	32											460			
5/27/01	123	249	64	32			2								470			
5/28/01	31	214	68	34	1										348		1	
5/29/01	24	173	61	26	4										288		1	
5/30/01	84	320	106	34											544		2	
5/31/01	139	407	108	61	1										716			
<b>Totals</b>	<b>13212</b>	<b>8360</b>	<b>1514</b>	<b>614</b>	<b>12</b>	<b>2</b>	<b>1</b>	<b>6</b>						<b>23721</b>		<b>258</b>		
<b>Total estimated chinook = 23935</b>																		

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**Appendix C. Chinook captured in June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																	
0.01% mortalities for the month of June																	
Chinook																	
Date	Forklength (mm)														Total Chinook	Comments	fresh mortalities
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160			
6/1/01	66	196	112	50	9										433		
6/2/01	23	85	128	21	2										259		1
6/3/01	22	252	154	52	6										486		
6/4/01	40	119	65	36	2										262		
6/5/01	9	124	81	39	4										257		
6/6/01	50	214	79	43	3										389		
6/7/01	47	252	105	73	6										483		
6/8/01	95	137	71	25	3										331		
6/9/01	64	248	75	41	6										434		3
6/10/01	6	7													13	Branches stu	12
6/11/01	5	140	121	26	3										295		
6/12/01	8	180	120	67	10										385		
6/13/01	7	155	104	55	8										329		1
6/14/01	12	115	107	41	14										289		
6/15/01	7	99	126	66	10										308		
6/16/01	6	38	17	3											64	Branches stu	45
6/17/01	9	77	82	43	10										221	Morts could be	
6/18/01	3	84	102	29	4										222	from yesterday	
6/19/01	5	91	133	64	14										307		
6/20/01	6	85	78	40	7										216		
6/21/01	8	103	80	18	8										217		
6/22/01	6	98	73	51	17	1									246		
6/23/01	4	79	83	34	11	1									212		
6/24/01		59	137	65	20	1									282		
6/25/01	2	86	128	82	22	1									319		
6/26/01	3	103	115	67	26										314		
6/27/01		270	199	84	17										570		
6/28/01	13	135	181	40	3										372		
6/29/01	1	81	100	42	4										228		
6/30/01	1	44	47	22	7										121		
<b>Totals</b>	<b>528</b>	<b>3756</b>	<b>3003</b>	<b>1319</b>	<b>256</b>	<b>4</b>									<b>8864</b>		<b>62</b>
<b>Total estimated chinook = 8864</b>																	

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**Appendix D. Chinook captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																	
0.00% mortalities for the month of July																	
Chinook																	
Date	Forklength (mm)														Total Chinook	Comments	fresh mortalities
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160			
7/1/01		32	40	27	12	2									113		
7/2/01		20	35	22	17	1									95		
7/3/01	1	14	34	31	6										86		
7/4/01		25	38	32	20	4									119		
7/5/01		24	46	21	18	3									112		
7/6/01		21	67	31	10	1									130		
7/7/01		9	66	41	6										122		
7/8/01		5	63	31	18	6									123		
7/9/01		6	26	43	22	1									98		
7/10/01		14	33	31	28	2									108		
7/11/01		18	40	25	23	2	1								109		
7/12/01																	Trap closed, flash flood
7/13/01		26	56	32	30	1									145		
7/14/01		15	69	27	25										136		
7/15/01		12	34	41	20	4									111		
7/16/01		10	19	21	23	6									79		
7/17/01		11	20	23	9	2									65		
7/18/01		6	25	15	8	1									55		
7/19/01		6	6	12	6	1									31		
7/20/01		5	11	11	6										33		
7/21/01		4	7	13											24		
7/22/01		7	5	9	4										25		
7/23/01		5	5	7	7	1									25		
7/24/01		7	10	11	6										34		
7/25/01		9	15	9	3										36	Trap removed	
7/26/01																for season	
7/27/01																	
7/28/01																	
7/29/01																	
7/30/01																	
7/31/01																	
<b>Totals</b>	<b>1</b>	<b>311</b>	<b>770</b>	<b>566</b>	<b>327</b>	<b>38</b>	<b>1</b>								<b>2014</b>		<b>0</b>
	<b>Total estimated chinook = 2182</b>																

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**Appendix E. Steelhead captured in April and May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001  
0.00% percent mortalities for the month of March

Steelhead

Date	Forklength (mm)											Total Steelhead	Comments	fresh mortalities			
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140				141-150	151-160	>160
3/27/01			1	5	6	7	1	2		1		1		1	25		
3/28/01				3	12	3	3	1						1	23		
3/29/01				4	6	4	1	2			1		1		19		
3/30/01					4	5	1			1	2	1			14		
3/31/01																trap closed	
<b>Totals</b>			<b>1</b>	<b>12</b>	<b>28</b>	<b>19</b>	<b>6</b>	<b>5</b>		<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>81</b>		<b>0</b>

Total estimated steelhead = 94

Horse Linto - Downstream Migrant Trap Data 2001  
0.00% percent mortalities for the month of April

Steelhead

Date	Forklength (mm)											Total Steelhead	Comments	fresh mortalities			
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140				141-150	151-160	>160
4/1/01																trap closed	
4/2/01			1	1	5	2	2		3			1			15		
4/3/01						1	1	1							4		
4/4/01															0		
4/5/01					2	1			1				1		5		
4/6/01				1	1			1							3		
4/7/01					1	1	1	1	1					1	6		
4/8/01				1	1										2		
4/9/01															0		
4/10/01					1	1								1	3		
4/11/01				1	2	1	1								5		
4/12/01				1				1							2		
4/13/01								1							1		
4/14/01				3		1			1						5		
4/15/01				3	2	1									5		
4/16/01				2	1	3	4		1		1				12		
4/17/01				3	8	9	5	2	2	1		1		4	35		
4/18/01				3	8	10	6	2	3	2		1	1	2	38		
4/19/01					5	6	4	2	3	2	1		1	2	26		
4/20/01				2	4	1	2		2			1			12		
4/21/01					4				1	1	1	2			9		
4/22/01					4	2	3	2						1	12		
4/23/01				1	6	5	3	1	1			1			18		
4/24/01				1	7	9	4	3	1	1	1				27		
4/25/01			1	2	5	9	10	7	4	3	2		2		45		
4/26/01				4	13	13	7	1	4	2			1	1	46		
4/27/01				6	14	8	8	4	3	2	1			1	47		
4/28/01				4	7	9	3	2	4	2	2		1		34		
4/29/01																trap closed	
4/30/01			1		4	4	3	1	1	1					15		
<b>Totals</b>			<b>3</b>	<b>28</b>	<b>80</b>	<b>108</b>	<b>76</b>	<b>43</b>	<b>33</b>	<b>22</b>	<b>12</b>	<b>8</b>	<b>9</b>	<b>12</b>	<b>434</b>		<b>0</b>

Total estimated steelhead = 434

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**Appendix F. Steelhead captured in May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001

0.00% mortalities for the month of May

Steelhead

Date	Forklength (mm)														Total Steelhead	Comments	fresh mortalities
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160			
5/1/01					5	11	3	3	0	1	0	0	0	2	25		
5/2/01																trap closed	
5/3/01					5	4	1	1	0	1	1	0	1	1	15		
5/4/01					3	5	2	0	3		0	0	0	1	13		
5/5/01	1	0	0	0	2	2	7	5	2	2	0	0	1	0	22		
5/6/01				1	4	5	6	2	0	1	0	1	0	0	20		
5/7/01					2	4	6	5	0	1					18		
5/8/01	4			2	5	5	5	10	1	1	1	1	0	0	35		
5/9/01	2	0	0	0	5	9	7	5	9	6	4	2	1	1	51		
5/10/01	2				1	7	9	14	6	4	2	1	1	0	47		
5/11/01	3			1	6	5	11	19	10	4	3	3	3	5	73		
5/12/01	2				1	6	10	20	14	5	5		2		65		
5/13/01	0				3	8	16	16	9	6		1	1	1	61		
5/14/01	6				3	5	14	7	3	7		3			48		
5/15/01	1				2	7	6	4	4					1	25		
5/16/01	1				7	12	31	34	20	4	2			1	112		
5/17/01					2	13	13	8	9	1	2	3			51		
5/18/01	11			2	1	4	11	6	2	2	2				41		
5/19/01						4	4	4	2	2	2			1	19	one 300mm adult	
5/20/01	5			1			8	2		1				1	18		
5/21/01	15				2	1	6	3	5	3	1		1		37		
5/22/01	8				1		6	4	2	1					22		
5/23/01	1				1	1	6	5	6	4					24		
5/24/01	3					3	8	7	2	2	2				27		
5/25/01						1	3	2	4						10		
5/26/01	4							1	3	4			2		14		
5/27/01	6						1	4	5	2	2				20		
5/28/01	4						3	7	3	3					20		
5/29/01	6						3		1	2			1		13		
5/30/01	9				1	1	2	1	2					1	17		
5/31/01	38					3		3	1	2	1				48		
<b>Totals</b>	<b>132</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>62</b>	<b>126</b>	<b>208</b>	<b>202</b>	<b>122</b>	<b>78</b>	<b>30</b>	<b>15</b>	<b>14</b>	<b>16</b>	<b>1011</b>		<b>0</b>

Total estimated steelhead = 1033

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**Appendix G. Steelhead captured in June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001  
0.03% mortalities for the month of June

Steelhead

Date	Forklength (mm)													Total Steelhead	Comments	fresh mortalities	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160				>160
6/1/01	75	3	8	1		1	2	1		1	1			2	95		
6/2/01	13					1	1	1	1	1				2	20		
6/3/01	5	2							1	2					10		
6/4/01	3													1	4		
6/5/01	1					1		1		1	1		1		6		
6/6/01	18								1				1		20		
6/7/01	45														45		
6/8/01	9						2						1	1	13		
6/9/01	15							1				1	1	1	19		
6/10/01	20														20	Branch stuck	17
6/11/01	13					1	2								16		
6/12/01	96					3	3								102		
6/13/01	20	1						1	1			1		3	27		
6/14/01	57	5				1	1	1							65		1
6/15/01	32					1	1			1				2	37		
6/16/01	30														30	Branch stuck	28
6/17/01	58						1			1				1	61		
6/18/01	42	1				1					1	1		1	47		
6/19/01	33	4						1		2		1			41		
6/20/01	67	3					1			1					72		
6/21/01	36	20					1	2	1					2	62		
6/22/01	32	1							1		1				35		
6/23/01	33														33		
6/24/01	71	3				1	2	1							78		
6/25/01	59	7					1	1			1				69		
6/26/01	49	9					2	1							61		
6/27/01	135	15										1			151		1
6/28/01	77	4				1	4		2		1				89		
6/29/01	30	11	3				1	1	1			1			48		
6/30/01	33	13					1			1					48		
<b>Totals</b>	<b>1207</b>	<b>102</b>	<b>11</b>	<b>1</b>		<b>12</b>	<b>26</b>	<b>13</b>	<b>9</b>	<b>11</b>	<b>6</b>	<b>6</b>	<b>4</b>	<b>16</b>	<b>1424</b>		<b>47</b>

Total estimated steelhead = 1424

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**Appendix H. Steelhead captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001

0.00% mortalities for the month of July

Steelhead

Date	Forklength (mm)														Total Steelhead	Comments	fresh mortalities
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160			
7/1/01	28	22	1							1				1	53		
7/2/01	27	4						1	3		1			1	37		
7/3/01	15	12	1				1	1							30		
7/4/01	16	18	1	1		1						1			38		
7/5/01	7	3	1				3					1	1		16		
7/6/01	16	20	2												38		
7/7/01	21	40					1	1					1	1	65		
7/8/01	31	35	4												70		
7/9/01	32	34	6												72		
7/10/01	31	42	8												81		
7/11/01	30	79	14				1				1				125		
7/12/01																Trap closed, flash flood	
7/13/01	24	38	16	1				1						1	81		
7/14/01	72	71	14		1									1	159		
7/15/01	40	43	16					1		2	1			1	104		
7/16/01	45	63	14				1	1	1						125		
7/17/01	43	44	19						1						107		
7/18/01	44	40	11	2											97		
7/19/01	23	48	8	1											80		
7/20/01	23	42	12	1		1					1				80		
7/21/01	28	55	6									1	1		91		
7/22/01	21	35	10	2						1				1	70		
7/23/01	41	62	18							1		1			123		
7/24/01	32	54	9								1		1		97		
7/25/01	40	47	4												91	Trap closed	
7/26/01																for season	
7/27/01																	
7/28/01																	
7/29/01																	
7/30/01																	
7/31/01																	
<b>Totals</b>	<b>730</b>	<b>951</b>	<b>195</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>1930</b>		<b>0</b>

Total estimated steelhead = 2032

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**Appendix I. Coho captured in April and May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
March																
Coho																
Date	Forklength (mm)														Total Coho	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
3/27/01																
3/28/01																
3/29/01																
3/30/01																
3/31/01															trap closed	
<b>Totals</b>															<b>0</b>	
Horse Linto - Downstream Migrant Trap Data 2001																
April																
Coho																
Date	Forklength (mm)														Total Coho	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
4/1/01															trap closed	
4/2/01																
4/3/01																
4/4/01																
4/5/01																
4/6/01																
4/7/01																
4/8/01																
4/9/01																
4/10/01																
4/11/01																
4/12/01																
4/13/01																
4/14/01																
4/15/01																
4/16/01																
4/17/01																
4/18/01																
4/19/01																
4/20/01																
4/21/01																
4/22/01																
4/23/01																
4/24/01																
4/25/01																
4/26/01										1					1	
4/27/01																
4/28/01																
4/29/01															trap closed	
4/30/01																
<b>Totals</b>										<b>1</b>					<b>1</b>	



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**Appendix J. Coho captured in May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
May																
Coho																
Date	Forklength (mm)														Total Coho	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
5/1/01																
5/2/01																
5/3/01																
5/4/01																
5/5/01																
5/6/01																
5/7/01																
5/8/01																
5/9/01																
5/10/01																
5/11/01																
5/12/01																
5/13/01																
5/14/01																
5/15/01																
5/16/01																
5/17/01																
5/18/01																
5/19/01																
5/20/01																
5/21/01																
5/22/01																
5/23/01																
5/24/01																
5/25/01																
5/26/01																
5/27/01																
5/28/01																
5/29/01																
5/30/01																
5/31/01																
<b>Totals</b>																

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**Appendix K. Coho captured in June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
June																
Coho																
Date	Forklength (mm)														Total Coho	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
6/1/01																
6/2/01																
6/3/01																
6/4/01																
6/5/01																
6/6/01																
6/7/01																
6/8/01	1														1	
6/9/01																
6/10/01																
6/11/01																
6/12/01																
6/13/01																
6/14/01																
6/15/01																
6/16/01																
6/17/01																
6/18/01																
6/19/01		1													1	
6/20/01																
6/21/01																
6/22/01		1													1	
6/23/01																
6/24/01																
6/25/01																
6/26/01																
6/27/01																
6/28/01																
6/29/01																
6/30/01																
<b>Totals</b>	<b>1</b>	<b>2</b>													<b>3</b>	

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**Appendix L. Coho captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
July																
Coho																
Date	Forklength (mm)													Total Coho	Comments	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160			>160
7/1/01		1													1	
7/2/01																
7/3/01																
7/4/01		1													1	
7/5/01																
7/6/01			1												1	
7/7/01			1												1	
7/8/01																
7/9/01																
7/10/01			1												1	
7/11/01			1	1											2	
7/12/01																Trap closed
7/13/01			2												2	
7/14/01				1											1	
7/15/01																
7/16/01																
7/17/01																
7/18/01																
7/19/01																
7/20/01																
7/21/01																
7/22/01																
7/23/01																
7/24/01																
7/25/01																Trap closed
7/26/01																for season
7/27/01																
7/28/01																
7/29/01																
7/30/01																
7/31/01																
<b>Totals</b>		<b>2</b>	<b>6</b>	<b>2</b>											<b>10</b>	

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**Appendix M. Dace captured in April and May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
March																
Dace																
Date	Forklength (mm)														Total Dace	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
3/27/01				1											1	
3/28/01																
3/29/01					1										1	
3/30/01					1										1	
3/31/01																Trap closed
<b>Totals</b>				<b>1</b>	<b>2</b>										<b>3</b>	
Horse Linto - Downstream Migrant Trap Data 2001																
April																
Dace																
Date	Forklength (mm)														Total Dace	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
4/1/01																Trap closed
4/2/01																
4/3/01																
4/4/01																
4/5/01																
4/6/01																
4/7/01																
4/8/01																
4/9/01																
4/10/01																
4/11/01				1											1	
4/12/01					2										2	
4/13/01								1							1	
4/14/01				1				1							2	
4/15/01				1	2										3	
4/16/01					1	1	1								3	
4/17/01				3	1	1									5	
4/18/01				3	1										4	
4/19/01					1	1									2	
4/20/01				1											1	
4/21/01																
4/22/01					2										2	
4/23/01				3	4		1								8	
4/24/01				4	4	1	3								12	
4/25/01			1	5	5	4									15	
4/26/01				1	5	5	2								13	
4/27/01				7	5										12	
4/28/01				2	3										5	
4/29/01																Trap closed
4/30/01							1								1	
<b>Totals</b>			<b>1</b>	<b>32</b>	<b>36</b>	<b>14</b>	<b>9</b>								<b>92</b>	

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**Appendix N. Dace captured in May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
May																
Dace																
Date	Forklength (mm)														Total Dace	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
5/1/01				2	3	1									6	
5/2/01																Trap closed
5/3/01				1		1									3	
5/4/01				6	10	3	1								20	
5/5/01				4	7	3	1								15	
5/6/01				4	7	2									13	
5/7/01				2	6	9	3								20	
5/8/01				14	18	14	2								48	
5/9/01				14	8	4	2								28	
5/10/01					8	9	4								21	
5/11/01				14	20	3		1							38	
5/12/01				12	24	29	6	3							74	
5/13/01				1	3	1	2	1	1						9	
5/14/01			1	1	1	6	2	0							11	
5/15/01				1	1										2	
5/16/01				3	3	2		1							9	
5/17/01				4	3	2		1							10	
5/18/01				6	8	3	1	1							19	
5/19/01			6	14	14	6									40	
5/20/01			4	23	20	17	4	2							70	
5/21/01			0	9	31	11	11	1							63	
5/22/01			2	28	19	4	1								54	
5/23/01			8	6	8	5	3	2							32	
5/24/01			2	5	6	8	1								22	
5/25/01			1	5	12	5	1								24	
5/26/01			1	9	14	4	1								29	
5/27/01			4	13	12	1	1		1						32	
5/28/01				2	1	2									5	
5/29/01			1	2	2			1							6	
5/30/01				2	7	4									13	
5/31/01				13	25	7	4	1							50	
<b>Totals</b>				<b>30</b>	<b>220</b>	<b>301</b>	<b>166</b>	<b>52</b>	<b>15</b>	<b>2</b>					<b>786</b>	

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**Appendix O. Dace captured in June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
June																
Dace																
Date	Forklength (mm)														Total	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Dace	
6/1/01			3	9	12	6	4								34	
6/2/01				1		2									3	
6/3/01					1										1	
6/4/01					3	1									4	
6/5/01				1				1							2	
6/6/01				1	3										4	
6/7/01				3	12	4									19	
6/8/01			1	3	6	2	1								13	
6/9/01					6			1							7	
6/10/01																
6/11/01																
6/12/01				4	3	1		1							9	
6/13/01			1		2										3	
6/14/01					3	2									5	
6/15/01				2	2	2									6	
6/16/01																
6/17/01				1	7	2									10	
6/18/01				1			1								2	
6/19/01			1	2	1										4	
6/20/01			1	3	5	1									10	
6/21/01				3	1	2	2								8	
6/22/01			2	1	1										4	
6/23/01				1		1									2	
6/24/01				1											1	
6/25/01				1											1	
6/26/01				1											1	
6/27/01				1	1										2	
6/28/01			1	1	3										5	
6/29/01				1	2										3	
6/30/01				1		2									3	
<b>Totals</b>			<b>10</b>	<b>43</b>	<b>74</b>	<b>28</b>	<b>8</b>	<b>3</b>							<b>166</b>	

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**Appendix P. Dace captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
July																
Dace																
Date	Forklength (mm)														Total	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Dace	
7/1/01				1			1								2	
7/2/01				1											1	
7/3/01					1										1	
7/4/01				1	3	1									5	
7/5/01				2											2	
7/6/01			1	3			1								5	
7/7/01				2											2	
7/8/01						1									1	
7/9/01				1	1										2	
7/10/01				1											1	
7/11/01				1											1	
7/12/01																Trap closed, flash flood
7/13/01																
7/14/01				1	1	1									3	
7/15/01				1		1									2	
7/16/01					1										1	
7/17/01																
7/18/01				1		1									2	
7/19/01			2	3											5	
7/20/01					1	1									2	
7/21/01			1	4											5	
7/22/01			2	5											7	
7/23/01				5	2										7	
7/24/01			3	5	1										9	
7/25/01			2	6											8	Trap closed
7/26/01																for season
7/27/01																
7/28/01																
7/29/01																
7/30/01																
7/31/01																
<b>Totals</b>			<b>11</b>	<b>44</b>	<b>11</b>	<b>6</b>	<b>2</b>								<b>74</b>	

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**Appendix Q. Lamprey captured March and April 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
March																
Lamprey																
Date	Forklength (mm)														Total Lamprey	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
3/27/01																
3/28/01				1						1						
3/29/01		1														
3/30/01																
3/31/01																
<b>Totals</b>		<b>1</b>		<b>1</b>						<b>1</b>					<b>3</b>	
Horse Linto - Downstream Migrant Trap Data 2001																
April																
Lamprey																
Date	Forklength (mm)														Total Lamprey	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
4/1/01																
4/2/01																
4/3/01																
4/4/01																
4/5/01																
4/6/01																
4/7/01																
4/8/01																
4/9/01																
4/10/01																
4/11/01																
4/12/01																
4/13/01																
4/14/01	1							1								
4/15/01																
4/16/01																
4/17/01																
4/18/01																
4/19/01																
4/20/01																
4/21/01																
4/22/01																
4/23/01																
4/24/01																
4/25/01																
4/26/01																
4/27/01																
4/28/01																
4/29/01																
4/30/01																
<b>Totals</b>	<b>1</b>							<b>1</b>							<b>2</b>	



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**Appendix R. Lamprey captured in May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
May																
Lamprey																
Date	Forklength (mm)														Total	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Lamprey	Comments
5/1/01																
5/2/01																Trap closed
5/3/01																
5/4/01																
5/5/01																
5/6/01																
5/7/01																
5/8/01																
5/9/01	1														1	
5/10/01									1					2	3	2 400+
5/11/01														1	1	
5/12/01							1								1	
5/13/01										1				3	4	
5/14/01																
5/15/01													2		2	
5/16/01								1							1	
5/17/01																
5/18/01																
5/19/01														1	1	
5/20/01														1	1	
5/21/01																
5/22/01														3	3	
5/23/01														2	2	
5/24/01																
5/25/01														1	1	
5/26/01														1	1	
5/27/01																
5/28/01																
5/29/01														1	1	
5/30/01																
5/31/01																
<b>Totals</b>	<b>1</b>						<b>1</b>	<b>1</b>		<b>1</b>	<b>1</b>		<b>2</b>	<b>16</b>	<b>23</b>	

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**Appendix S. Lamprey captured in June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
June																
Lamprey																
Date	Forklength (mm)														Total	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Lamprey	
6/1/01																
6/2/01																
6/3/01																
6/4/01																
6/5/01																
6/6/01																
6/7/01																
6/8/01																
6/9/01																
6/10/01																
6/11/01																
6/12/01																
6/13/01																
6/14/01																
6/15/01																
6/16/01											1				1	
6/17/01																
6/18/01																
6/19/01																
6/20/01																
6/21/01					1										1	
6/22/01																
6/23/01																
6/24/01																
6/25/01																
6/26/01		1													1	
6/27/01																
6/28/01		1													1	
6/29/01																
6/30/01																
<b>Totals</b>		<b>2</b>			<b>1</b>						<b>1</b>				<b>4</b>	

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**Appendix T. Lamprey captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
July																
Lamprey																
Date	Forklength (mm)														Total Lamprey	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
7/1/01																
7/2/01																
7/3/01																
7/4/01											1				1	
7/5/01																
7/6/01																
7/7/01																
7/8/01																
7/9/01																
7/10/01																
7/11/01																
7/12/01															Trap closed	
7/13/01																
7/14/01																
7/15/01																
7/16/01										1					1	
7/17/01																
7/18/01																
7/19/01																
7/20/01		1													1	
7/21/01																
7/22/01																
7/23/01																
7/24/01																
7/25/01		1													1	
7/26/01															Trap closed for season	
7/27/01																
7/28/01																
7/29/01																
7/30/01																
7/31/01																
<b>Totals</b>		<b>2</b>								<b>1</b>	<b>1</b>				<b>4</b>	

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**Appendix U. Sculpin captured March and April 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
March																
Sculpin																
Date	Forklength (mm)														Total	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Sculpin	
3/27/01							1								1	
3/28/01																
3/29/01								2							2	
3/30/01							1								1	
3/31/01																Trap closed
<b>Totals</b>							<b>2</b>	<b>2</b>							<b>4</b>	
Horse Linto - Downstream Migrant Trap Data 2001																
April																
Sculpin																
Date	Forklength (mm)														Total	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160	Sculpin	
4/1/01																Trap closed
4/2/01																
4/3/01																
4/4/01																
4/5/01																
4/6/01																
4/7/01																
4/8/01																
4/9/01																
4/10/01																
4/11/01																
4/12/01								1							1	
4/13/01							2								2	
4/14/01																
4/15/01																
4/16/01								1							1	
4/17/01																
4/18/01																
4/19/01							1								1	
4/20/01									1						1	
4/21/01																
4/22/01																
4/23/01																
4/24/01																
4/25/01																
4/26/01								1							1	
4/27/01														1	1	
4/28/01																
4/29/01																Trap closed
4/30/01																
<b>Totals</b>							<b>3</b>	<b>3</b>	<b>1</b>					<b>1</b>	<b>8</b>	

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**Appendix V. Sculpin captured in May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
May																
Sculpin																
Date	Forklength (mm)														Total Sculpin	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
5/1/01																
5/2/01																Trap closed
5/3/01									1	1						2
5/4/01									1							1
5/5/01																
5/6/01																
5/7/01																
5/8/01																
5/9/01											1					1
5/10/01																
5/11/01							2									2
5/12/01																
5/13/01																
5/14/01								1								1
5/15/01																
5/16/01																
5/17/01																
5/18/01																
5/19/01										1			1			2
5/20/01																
5/21/01																
5/22/01							1	1								2
5/23/01								1								1
5/24/01																
5/25/01																
5/26/01							3	1								4
5/27/01						1	3	1								5
5/28/01								2								2
5/29/01																
5/30/01						1	1	1								3
5/31/01										1						1
<b>Totals</b>						<b>2</b>	<b>10</b>	<b>8</b>	<b>3</b>	<b>2</b>	<b>1</b>		<b>1</b>			<b>27</b>

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**Appendix W. Sculpin captured in June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
June																
Sculpin																
Date	Forklength (mm)														Total Sculpin	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
6/1/01							1	1							2	
6/2/01					1	2									3	
6/3/01				2		1	2	1							6	
6/4/01																
6/5/01																
6/6/01																
6/7/01					1		1								2	
6/8/01							1	2			1				4	
6/9/01							1								1	
6/10/01																
6/11/01							2							1	3	
6/12/01					1										1	
6/13/01																
6/14/01								1							1	
6/15/01																
6/16/01																
6/17/01								2							2	
6/18/01							1					1			2	
6/19/01					2	1	1								4	
6/20/01							1								1	
6/21/01								1							1	
6/22/01							1								1	
6/23/01							2				1	1			4	
6/24/01																
6/25/01																
6/26/01												1			1	
6/27/01											1				1	
6/28/01							2								2	
6/29/01										1					1	
6/30/01																
<b>Totals</b>				<b>2</b>	<b>5</b>	<b>15</b>	<b>11</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>		<b>1</b>	<b>43</b>	

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**Appendix X. Sculpin captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
July																
Sculpin																
Date	Forklength (mm)														Total Sculpin	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
7/1/01																
7/2/01																
7/3/01										1					1	
7/4/01																
7/5/01																
7/6/01										1					1	
7/7/01						1		1				1			3	
7/8/01						1	2	1	1						5	
7/9/01						1	2		1						4	
7/10/01						1	2		3						6	
7/11/01																
7/12/01															Trap closed	
7/13/01						1				1					2	
7/14/01					1		1	1							3	
7/15/01					1										1	
7/16/01						1									1	
7/17/01																
7/18/01						1									1	
7/19/01																
7/20/01																
7/21/01																
7/22/01																
7/23/01																
7/24/01																
7/25/01															Trap closed for season	
7/26/01																
7/27/01																
7/28/01																
7/29/01																
7/30/01																
7/31/01																
<b>Totals</b>					<b>2</b>	<b>7</b>	<b>7</b>	<b>3</b>	<b>5</b>	<b>3</b>		<b>1</b>			<b>28</b>	

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**Appendix Y. Total Sucker captured March and April 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
March																
Sucker																
Date	Forklength (mm)													Total Sucker	Comments	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160			>160
3/27/01																
3/28/01																
3/29/01																
3/30/01																
3/31/01																
Totals																
Horse Linto - Downstream Migrant Trap Data 2001																
April																
Sucker																
Date	Forklength (mm)													Total Sucker	Comments	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160			>160
4/1/01																
4/2/01																
4/3/01																
4/4/01																
4/5/01																
4/6/01																
4/7/01																
4/8/01																
4/9/01																
4/10/01																
4/11/01																
4/12/01																
4/13/01																
4/14/01																
4/15/01																
4/16/01																
4/17/01																
4/18/01																
4/19/01																
4/20/01																
4/21/01																
4/22/01																
4/23/01																
4/24/01														1		1
4/25/01																
4/26/01																
4/27/01														1		1
4/28/01																
4/29/01																
4/30/01																
Totals														2		2



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**Appendix Z. Total Sucker captured May 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
May																
Sucker																
Date	Forklength (mm)														Total Sucker	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
5/1/01																
5/2/01																
5/3/01																
5/4/01																
5/5/01																
5/6/01																
5/7/01																
5/8/01																
5/9/01																
5/10/01																
5/11/01																
5/12/01																
5/13/01																
5/14/01																
5/15/01																
5/16/01																
5/17/01																
5/18/01																
5/19/01																
5/20/01																
5/21/01																
5/22/01																
5/23/01																
5/24/01																
5/25/01																
5/26/01																
5/27/01																
5/28/01														1	1	
5/29/01																
5/30/01																
5/31/01																
<b>Totals</b>														<b>1</b>	<b>1</b>	

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**Appendix AA. Total Sucker captured June 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																
June																
Sucker																
Date	Forklength (mm)														Total Sucker	Comments
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160		
6/1/01																
6/2/01																
6/3/01																
6/4/01																
6/5/01																
6/6/01																
6/7/01																
6/8/01																
6/9/01																
6/10/01																
6/11/01																
6/12/01																
6/13/01																
6/14/01														1	1	
6/15/01																
6/16/01																
6/17/01																
6/18/01																
6/19/01																
6/20/01																
6/21/01														1	1	
6/22/01																
6/23/01																
6/24/01																
6/25/01																
6/26/01																
6/27/01																
6/28/01														1	1	
6/29/01																
6/30/01																
<b>Totals</b>														<b>3</b>	<b>3</b>	

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**Appendix AB. Total Sucker captured in July 2001.**

Horse Linto - Downstream Migrant Trap Data 2001																	
July																	
Sucker																	
Date	Forklength (mm)														Total Sucker	Comments	
	<40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	>160			
7/1/01																	
7/2/01																	
7/3/01																	
7/4/01															1	1	
7/5/01																	
7/6/01																	
7/7/01																	
7/8/01															1	1	
7/9/01																	
7/10/01																	
7/11/01															1	1	
7/12/01																	Trap closed
7/13/01																	
7/14/01																	
7/15/01																	
7/16/01																	
7/17/01																	
7/18/01																	
7/19/01															1	1	
7/20/01																	
7/21/01																	
7/22/01																	
7/23/01															1	1	
7/24/01															1	1	
7/25/01															3	3	Trap closed
7/26/01																	for season
7/27/01																	
7/28/01																	
7/29/01																	
7/30/01																	
7/31/01																	
<b>Totals</b>															<b>9</b>	<b>9</b>	