# Annual Report

## Fish Passage Operations

## at the Landsburg Dam Fish Passage Facilities

## on the Cedar River from

## September 2003 through June 2004

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**Summary**
This report summarizes fish passage operations from 9/16/03 through 6/30/04 at the newly constructed Landsburg Dam fish ladder and sorting facility on the Cedar River. Seattle Public Utilities (SPU) operated the ladder and sorting facility in sorting mode from 9/16/03 through 12/21/03 to prevent sockeye from passing above the Landsburg Dam and in passive mode from 12/22/03 through 6/30/04, providing unhindered passage above the dam for all native fish species. While in sorting mode a total of 1,107 sockeye entered the sorting facility, of which 331 were transported to the lower Cedar River and 645 were transported to the Cedar River Sockeye Hatchery for use as broodstock. In addition, 79 adult Chinook salmon were passed above the dam from 9/19/03 to 10/21/03 and 47 adult coho were passed above the dam from 10/11/03 to 12/21/03. These were the first anadromous fish passed above the Landsburg Dam in over a century. The facilities experienced some fish mortality, losing 4 adipose-clipped male Chinook, 1 male and 1 female coho, and 35 female and 71 male sockeye. The majority of the losses resulted from jumping behavior and as problem areas were detected, temporary restraints were installed. Permanent solutions are planned for the following year.

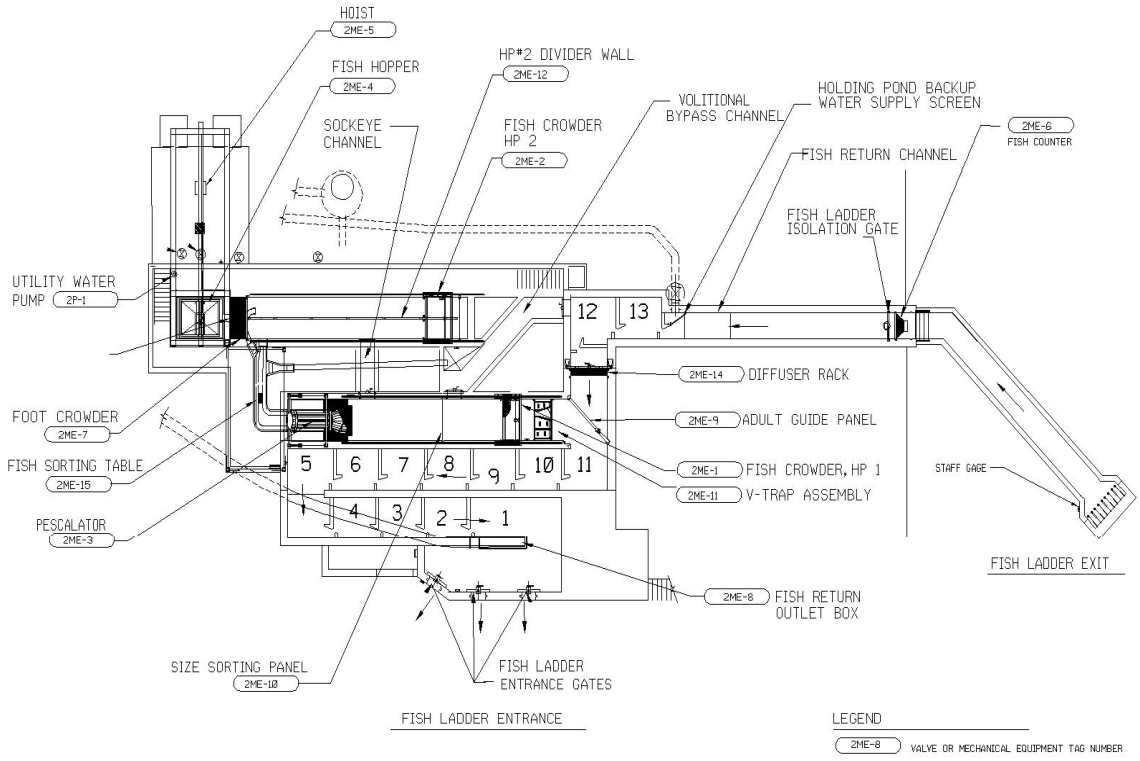
**Forward**
The construction of the fish ladder and sorting facility was completed as part of the comprehensive Cedar River Watershed Habitat Conservation Plan (HCP). The HCP was approved in the spring of 2000 and includes an extensive array of protective land management practices, instream flow management prescriptions, mitigation measures for the fish migration barrier at the Landsburg Diversion Dam and other habitat protection and restoration measures. The primary purpose of the HCP is to provide certainty for maintaining a safe and high quality drinking water source for the Seattle metropolitan area while protecting and restoring 83 species of fish and wildlife species and the habitats upon which they depend in the Cedar River basin. As part of the HCP, SPU constructed a fish ladder and sorting facility to provide passage above the dam for all native fish species in the Cedar River with the exception of sockeye salmon. Sockeye which spawn in the Cedar River in much greater numbers than other fish species are not passed above the dam because large numbers of decaying carcasses could pose a risk to drinking water quality and public health. The fish passage project successfully reopened more than 12.5 miles of mainstem and approximately 4.5 miles of tributary spawning and rearing habitat for the first time in more than 100 years.

**Introduction**
This 2004 annual report focuses on the operation of the Landsburg Dam fish ladder and sorting facility from 9/16/03 through 6/30/04; for detailed information on the other elements of fish passage at Landsburg such as the fish screens at municipal water intake, the downstream passage gate, and fish passage over the Lake Youngs aqueduct crossing, please refer to the Landsburg Fish Passage Facilities Operation and Maintenance Manual (MWH 2004) or visit the SPU website.

***Fish Ladder Components***
The fish ladder and sorting facility are composed of four main components the (1) lower ladder, (2) sorting and holding, (3) fish transport, and (4) upper ladder. The lower ladder includes three downward opening fish entrance gates, a series of 11 vertical slot steps in a channel that raises the water elevation in one-foot increments, and an adult guide panel gate. In general, the sorting and holding facility contain two holding ponds with mechanical crowders, a pescalator (fish lift), a sorting table, and a volitional bypass channel with a fish trap. Holding pond one is divided in half with a size sorting panel to allow smaller fish into the upper half of the pond and keep larger

fish in the lower half. Holding pond two contains a mechanical crowder and a wall that divides the pond lengthwise. The fish transport component contains a foot crowder, fish hopper, a 5-ton hoist, and parking area for the fish transport truck. The upper ladder contains 3 vertical slot steps, a fish counter, and the fish ladder exit. Figure 1 shows the layout of the fish ladder and sorting facility.

**Figure 1: Layout of Landsburg Dam Fish Ladder and Sorting Facility**




## Methods and Procedures

### *Sorting Mode*

The fish ladder and sorting facility were designed to operate in either sorting mode or passive mode. Sorting mode is used when sockeye are present at the ladder, typically from early September through December. In this mode, sockeye are sorted from Chinook or coho using a mechanical crowder in holding pond one. The crowder slowly moves fish towards a size sorting panel which passes smaller fish (mostly sockeye) into the upper half of pond one and retains Chinook and coho in the lower half. Fish retained in the lower half of holding pond one can be directed into a bypass channel. The mechanical crowder can then be used to move sockeye in the upper part of pond one to a pescalator that deposits fish on to the sorting table. The sorting table provides a work station to sort male and female sockeye into separate halves of holding pond two and move small Chinook or coho into totes or down a pipe to the bypass channel. To prepare sockeye for transport a mechanical crowder in holding pond two crowds sockeye into a hopper which can be raised with a 5-ton hoist and placed on a water filled tank on the fish truck. The hopper is designed to provide a water-to-water transfer of sockeye from the hopper to the fish truck.

***Passive Mode***

When the fish ladder is operated in passive mode all fish are allowed to bypass the sorting facility and move unhindered through the upper ladder and into river above the dam. The ladder was designed to be operated in this mode late December through late August (the period when sockeye are generally absent). In this mode, an electronic fish counting system in the upper ladder is designed to count and estimate the length of fish migrating upriver through the ladder. The system was installed to aid in the understanding of: run timing, the rate of passage upriver and the rate of recolonization of stream and river habitat in the watershed. The system uses a scanner unit to count fish and calculate the fish length, and an underwater camera takes up to five photographs of each fish passing upriver. A software package allows the photographic images to be displayed alongside each unique set of fish count data (i.e., date and time of upstream passage, fish depth, fish length, swimming direction, and water temperature).

## Results and Discussion

***Sorting Mode***

In late August, fish passage staff completed preseason projects for the first season of fish passage operations and the facility moved into sorting mode on September 16, 2003. Once in sorting mode the fish ladder and sorting facility was staffed 7 days per week with normal hours of operation ranging from 7:30 AM to 4:00 PM to 9:00 AM to 5:30 PM. The hours of operation were gradually shifted to later in the day to maximize the sorting operation based on observed fish movements. Fish were sorted approximately twice per day to minimize delay of upstream migrating Chinook and coho. In December, the staffing level was reduced to the fish passage operations project manager and one contract employee. The sorting operation was extended into January to get a better understanding of daily movement of coho within the ladder and to assist recolonization studies looking at coho movement and distribution within the watershed. Stream flows in the Cedar River (USGS gage 12117600 below Landsburg) during sorting mode ranged from 157 $ft^3/s$ to 1,400 $ft^3/s$ and the fish ladder operated as intended under these flow conditions (Fig. 2). Ambient water temperature at Landsburg ranged from 5.6 to 13 °C during this period (Fig 2).

***Sockeye***

From 9/16/2003 to 12/6/2003 1,107 sockeye entered the facility of which 283 females and 718 males were sorted. The daily peak of the sockeye migration at Landsburg occurred on 10/22/03 with 118 fish entering the facility (Table A2). Fish that entered the sorting facility were released back into in the Cedar River or they were moved to Cedar River Sockeye Hatchery for use as broodstock. As shown in Table 1, the facility lost roughly 10% of the sockeye that entered the facility with most of the mortalities attributed to fish jumping out of holding pond one. In addition, on 10/17/03 a back flow of chlorinated water from the Lake Youngs diversion pipeline entered the fish screen structure and flowed into the holding ponds killing 14 male and 13 female sockeye. Following this incident, SPU Treatment Operators at Landsburg modified their Standard Operating Protocols to prevent this accident from happening in the future.

**Table 1: Count of sockeye sorted, transported and mortality at the Landsburg Fish Passage Facility in 2003**

| | Entered Facility | Presort Mortality | Number Sorted | Post-sort Mortality | Transported to Hatchery | Transported to River | Total Mortality | Total Transported |
|---|---|---|---|---|---|---|---|---|
| Female | 318 | 22 | 283 | 13 | 184 | 87 | 35 | 271 |
| Male | 789 | 58 | 718 | 13 | 461 | 244 | 71 | 705 |
| **Total** | **1,107** | **80** | **1001** | **26** | **645** | **331** | **106** | **976** |

On October 21, 2003, a large flow event disabled the sockeye broodstock collection facility operated by the Washington Department of Fish and Wildlife (WDFW) at RM 6.5 on the Cedar River. WDFW requested broodstock from Landsburg to spawn with fish held at the hatchery. This request was brought before the Anadromous Fish Committee (AFC) at their regular meeting in October. AFC members reviewed the situation and recommended up to 1,000 sockeye or 20% of the broodstock for the hatchery could be collected from Landsburg. With guidance from the AFC, from mid-October to mid-November the fish passage and sorting facility provided 184 female sockeye and 461 male sockeye to the hatchery. All 645 sockeye delivered to the hatchery were marked with an opercle punch. The hatchery staff set aside most of these fish after spawning and fish passage staff removed otoliths from 564 of the Landsburg fish delivered to the hatchery. Otoliths were also removed from mortalities at the fish ladder and sorting facility. All otoliths were preserved in 4 ml vials filled with 70% ethyl alcohol and were provided to WDFW. This work was done to determine the origin (hatchery or wild) of sockeye migrating to Landsburg and to aid in the evaluation of the hatchery fry release strategy (i.e., how release timing and release location of fry affects the survival and homing of returning adults). An evaluation of the data in Table A3 (mortalities at Landsburg) indicated that 35% of the sockeye mortalities at Landsburg were of hatchery origin and 65% were of natural origin. An evaluation of the data in Table A4 (broodstock) indicated 36% of the sockeye provided to the hatchery were of hatchery origin, 61% were of natural origin and 3% were unreadable.

On 10/13/03 the fish passage staff started opercle punching all sockeye released in the river. The objective of this work was to monitor how many sockeye released in the lower river would return to Landsburg. A total of 33 females and 134 males were opercle punched and released at river mile 13.5 (also known as the trestle), 6 of the males returned to the ladder on the following days: 11/26, 12/3, 12/5, 12/6, 12/8, and 12/9. This represented less than four percent of the marked fish and suggests that few sockeye released at river mile 13.5 return to Landsburg.

***Chinook***

2003 marked the first year of a multi-year collaborative study to investigate and monitor the effects of recolonization by Chinook and coho on the Cedar River above the Landsburg Dam. Lead researchers included Peter Kiffney (NOAA), George Pess (NOAA), Joe Anderson and Tom Quinn (UW). The goal of the first year was to evaluate the movement and distribution of spawning Chinook and coho migrating above Landsburg and to collect tissue samples for future parentage DNA analysis. By tracking these fish, researchers hoped to learn which tributaries or reaches of the mainstem would be selected by first generation spawners in order to help identify what locations are associated with higher productivity as well as to provide insights into the overall productivity of fish that spawn upstream of Landsburg. To support the study, fish passage staff collected biological data from all adult Chinook passed above Landsburg and archived tissue samples for future parentage DNA analysis. To collect biological samples Chinook were captured in a fish trap located in the volitional bypass channel of the fish ladder. Fish were enumerated by species, sex, and the presence or absence of adipose fin; measured for length, and fin clipped on the dorsal fin to mark the fish and provide a tissue sample for future DNA analysis. A small portion of each fin clip was preserved in 100% ethanol for future genetic analysis (Table A1). The fin clips were triangle shaped and approximately 15 mm wide at the base. Each fish was examined at capture to determine if it had already been fin clipped and was recycling through the ladder.

Chinook salmon were passed upstream of the Landsburg Dam between September 19 and October 21. Table 2 shows that 16 female and 63 male adult Chinook were passed upstream in

2003. No Chinook recycled through the fish ladder in 2003. The majority of the fish passed upstream had clipped adipose fins indicating that they were of hatchery origin, however returning five year old Chinook may not have been clipped (pers. comm. Steve Foley, WDFW). Surveys conducted by Karl Burton (SPU) successfully located 15 redds in the mainstem above Landsburg. Four adipose-clipped male Chinook mortalities occurred in 2003, 3 were from jump outs and 1 was from the chlorine backflow event. These fish are not included in Table 2 because they were not passed above Landsburg.

**Table 2: Summary of Chinook passed above the Landsburg Dam on the Cedar River, 2003**

| | Fish Passed Upstream | | |
|---|---|---|---|
| | Adipose Absent | Adipose Present | **Total** |
| Female | 10 | 6 | **16** |
| Male | 45 | 18 | **63** |
| **Total** | **55** | **24** | **79** |

***Coho***

To support the recolonization study mentioned above, fish passage staff also collected biological data from all adult coho passed above Landsburg (same methods as with Chinook), implanted transmitters in some of these fish to track their movements and distribution, and archived tissue samples for future parentage DNA analysis.

Landsburg fish passage staff implanted 14 female and 23 male coho with radio transmitters for tracking with telemetry equipment. Most of the coho in this study were natural origin fish with only 2 females and 1 male missing their adipose fin. The implants were done with an esophageal insertion tube and the transmitters were placed in the stomach cavity. The first coho was implanted on 10/20/03 following the installation of radio tracking equipment above Landsburg. The sampling objective was to implant transmitters in as many coho as possible however Landsburg staff did have the discretion to not implant small coho. The transmitters were installed after the fish were anesthetized in a water bath containing MS222. Fish were allowed to recover for up to one hour before being released in the upper ladder.

Table 3 shows that 47 coho were passed upstream and that a vast majority of the fish had adipose fins indicating that they were of natural origin. No coho recycled through the ladder in 2003. The facility lost 1 male and 1 female wild coho from jumping out of pond one, these fish were not included in the total.

**Table 3: Summary of Coho passed above the Landsburg Dam on the Cedar River, 2003**

| | Fish Passed Upstream | | |
|---|---|---|---|
| | Adipose Absent | Adipose Present | Total |
| Female | 3 | 18 | 21 |
| Male | 1 | 25 | 26 |
| **Total** | **4** | **43** | **47** |

All the known and potential locations for fish jump outs were fortified with netting in late 2003.

Additional corrective measures were identified for the following season. The goal for the fish passage operation is to reduce mortality to less than 1%.

***Passive Mode***

On January 23, 2004, the fish passage operation shifted to passive mode providing fish unhindered passage above the Landsburg Dam. During passive mode, the Water Treatment Operators at Landsburg conducted routine inspections of the ladder facility to ensure there were no issues with debris, the water supply, or the fish counter/camera system. While in passive mode the fish counter/camera system installed in the upper ladder enumerated fish migrating upriver. The system was installed to aid in the understanding of run timing, the rate of passage upriver and the rate of recolonization of stream and river habitat in the watershed. The system is designed to count fish, calculate fish lengths, and take five photographs of each fish. A software package can be used to be display the photos alongside other data recorded by the system (i.e., date and time, fish depth, fish length, swimming direction, and water temperature). In some cases the imaging capabilities helped determine the species, sex, and if the fish had a clipped adipose fin. Stream flows in the Cedar River (USGS gage 12117600 below Landsburg) during passive mode ranged from 595 $ft^3/s$ to 1,650 $ft^3/s$ and the fish ladder operated as intended under these flow conditions (Fig. 3). Ambient water temperature at Landsburg ranged from 3.4 to 13.1 °C during this period (Fig 3).

***Trout***

A total 186 fish enumerated with the fish counter/camera in passive mode. It is possible that a few of the fish counted in late January and early February may have been coho. Fish counts showed the largest number of trout migrating above Landsburg from early March through early April (Fig. 3) with peak daily migration ranging from 1:00 PM to 6:00 PM (Fig. 4). Figure 5 shows the size distribution (estimated length) of trout moving above Landsburg with a fairly large number of 20 cm to 44 cm trout moving upstream in the winter and two presumptive steelhead in the 75-79 cm range.

In 2004, the camera system did not function on a continuous basis and was not able to take pictures at night or in low light conditions. The vendor did attempt to resolve these problems by replacing suspected faulty components. To date every component of the camera system has been replaced and despite these efforts the problems persisted throughout the first year of operations. The vendor has assured SPU that they will continue working on the problem. The fish counter and camera were not functioning 4/11/04 - 5/10/04 and 6/12/04 - 6/26/04.

***Fish Passage Facility Improvements Completed in 2003***

As with any new facility minor changes were made to the structure, equipment, and standard operating procedures (SOP). Throughout the fall and winter of 2003, the fish passage operations staff worked closely and successfully with the Landsburg Fish Passage project construction team to make changes to the facility that improved worker safety, job efficiency, and fish handling. Below are some of the improvements completed in 2003.

- Signs on ladder gates stating EMPLOYEES' ONLY NO PUBLIC ACCESS.
- Fall protection was installed around the opening for fish counter and chinook trap.
- Lightweight hinged aluminum grating replaced steel grating that was routinely removed.
- A float ring was installed on the ladders main deck.
- A manual fish gate was installed on the v-trap entrance of pond one so staff could open and close the entrance from the ladders main deck.

- A heavy aluminum gate on the fish hopper was replaced with a lightweight barred gate.
- A swing arm and pulley system was installed to raise and lower the fish hopper gate.
- Padlocks were placed on all fish passage gates and mechanical equipment.
- A release handle was installed on the hopper hatch to assist in the fish transfer process.
- Flexible extensions were installed on the end of the sorting table flumes to provide a more streamlined passage for fish into pond two.
- Three ½ totes (42"x 29"x 28") and an oxygen delivery system were installed behind the sorting table to temporarily hold coho for processing.

**Conclusions**

In 2003, the fish ladder and sorting facility at the Landsburg Dam provided a unique opportunity for SPU to tag, enumerate, and collect baseline biological data on the first Chinook and coho salmon, and trout passed above the Landsburg Dam in over a century. These data will be analyzed as part of the recolonization studies above Landsburg. In addition, the Landsburg staff collected baseline data on sockeye which allowed WDFW to analyze the origin of adults that migrated to Landsburg; and supported the broodstock collection efforts of the Cedar River Sockeye Hatchery. The first year of operations was considered very successful in terms of fish movement into and through the ladder. While the first year identified the need for some relatively minor modifications, the facilities worked as designed. This speaks to the careful and deliberate collaborative design and construction efforts on the part of NMFS, USFWS, Montgomery Watson Harza Engineers, Natt McDougal Construction, the Cedar River Anadromous Fish Committee and SPU.

**Recommendations**

In future years the fish ladder and sorting facility should continue to focus on:

- Providing a safe, efficient, and timely passage for all native fish species (with the exception of sockeye) over the Landsburg Dam
- Providing a safe, efficient, and timely trap and haul operation for sockeye
- Handling fish with great care and limit the use of nets when handling fish
- Monitoring, evaluating, and maintaining the facility to reduce or limit fish mortality
- Collect relevant data from upstream migrating adult salmon to help monitor various qualitative and quantitative aspects of salmon recolonization in the habitat upstream of the Landsburg Dam.
- Providing a safe working environment for staff

***Facility Improvements in 2004***

The following are some of the improvements that were identified for the fish ladder and sorting facility in 2004.

- An anti-fatigue and anti-slip mat will be installed around the sorting table.
- Aluminum lids will cover the top of the hopper to serve as jump protection and eliminate a fall hazard when the hopper is in the down position in the hopper bay.
- Communication capabilities at the facility will be enhanced with the use of handheld radios.
- The 5-ton hoist control pendent will be replaced with a Remtron remote receiver/transmitter system. This will provide staff with increased safety while moving the fish hopper overhead.
- Switches will be installed on overhead lights to eliminate the need to access an electrical panel to turn the lights on or off.

- An on/off switch will be installed for radiant heater to eliminate access to the electrical panel.
- A speed bump or rail system will be installed on the truck platform to better align the fish truck for loading.
- Aluminum jump protection / fall protection will be installed over the drain at end of holding pond two.
- Lightweight floating covers will be used for jump protection on the holding ponds to reduce fish jump out and mortality. The covers should also be easier to install and remove when compared to the weighted netting used last year.
- The fish ladder access along the dam will be gated and locked.
- Fish jump protection on adult guide panel will be improved providing making it easier to install and maintain.
- The facility staff will continue to update the SOP.
- SPU biologists will calibrate the fish counter/camera system and fine tune the camera imaging system.

## List of Figures

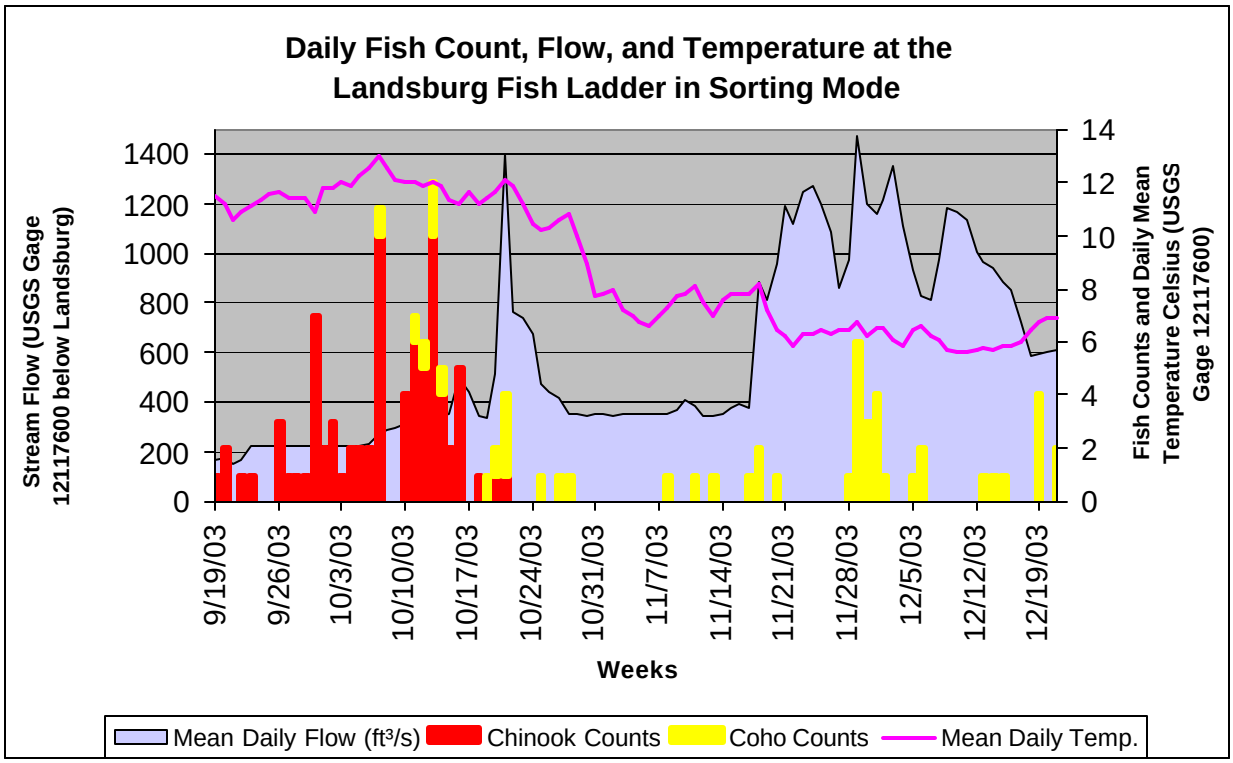



**Figure 2: Daily fish count, stream flow, and temperature by week while in sorting mode at the Landsburg Fish Ladder , 2003**

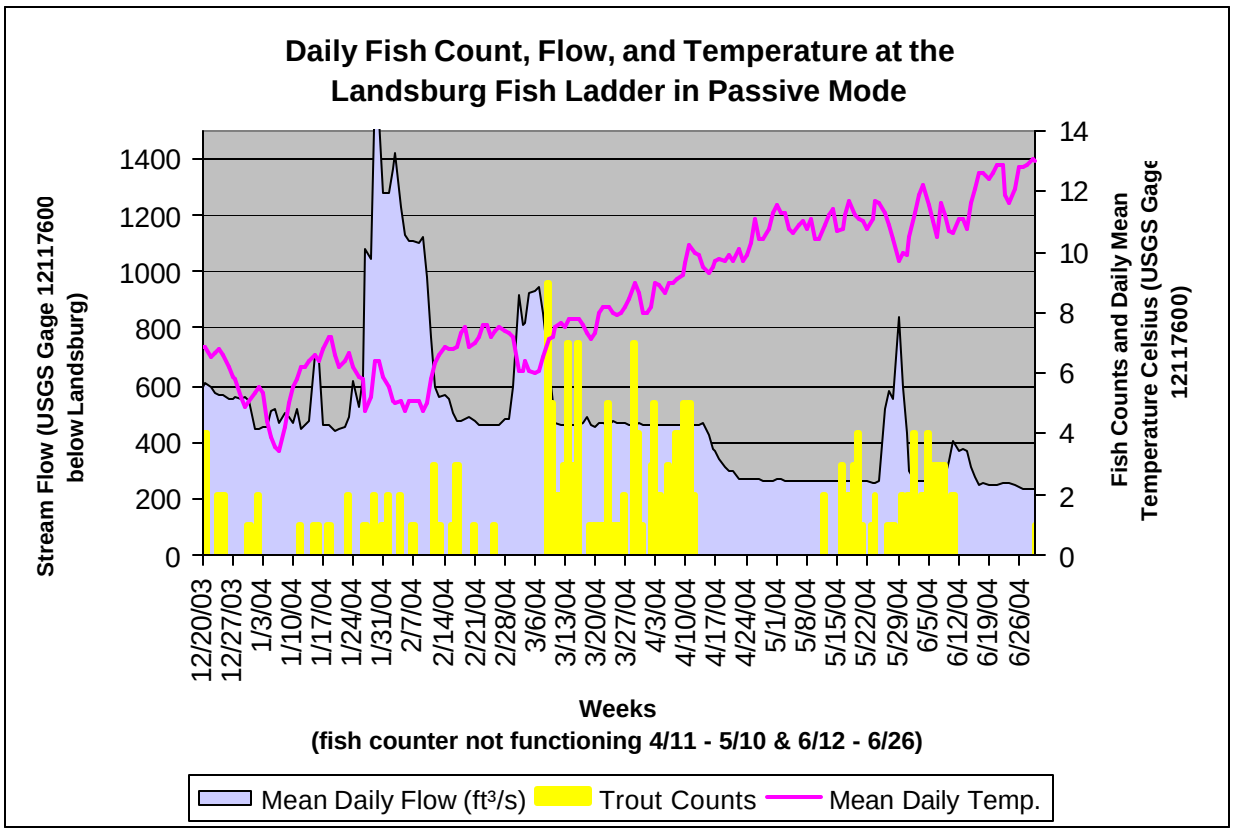



**Figure 3: Daily fish count, stream flow, and temperature by week while in passive mode at the Landsburg Fish Ladder , 2003/2004**
(Data provided by Karl Burton)

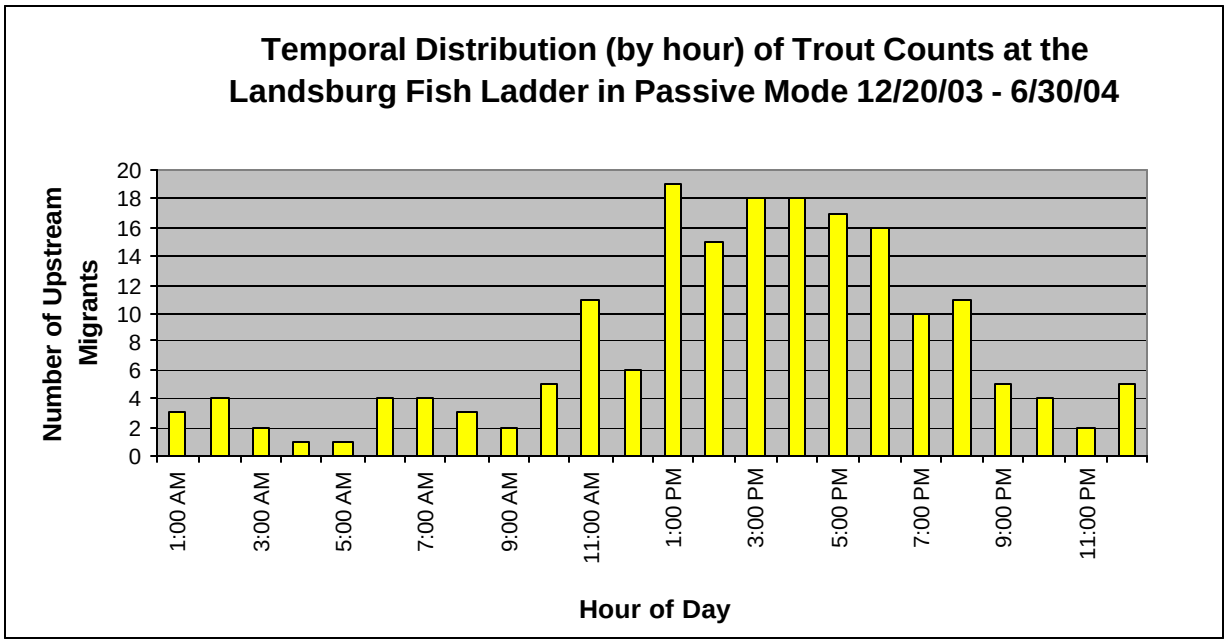



**Figure 4: Temporal Distribution (by hour) of Upstream Migrants passed above the Cedar River Landsburg Dam (Dec. 20, 2003 - June 30, 2004)**
(Data provided by Karl Burton)

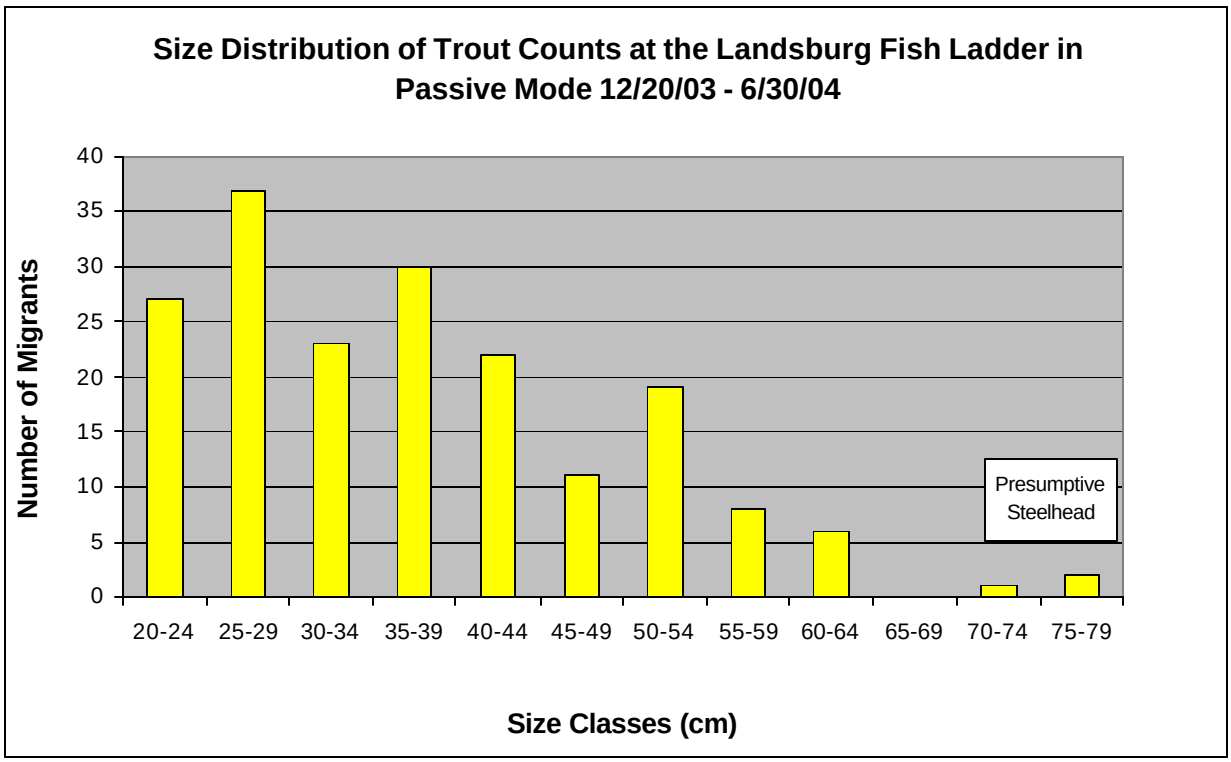



**Figure 5: Size Distribution of Upstream Migrants passed above the Cedar River Landsburg Dam (Dec. 20, 2003 - June 30, 2004)**
(Data provided by Karl Burton)

## Appendix A. Fish Count Data

**Table A 1: Daily Counts and Sample Numbers of Chinook and Coho passed above the Cedar River Landsburg Dam in Sorting Mode, 2003**

| Year | Sample No. | Species | Date | Fork length (mm) | Sex | Adipose | Original length metric |
|---|---|---|---|---|---|---|---|
| 2003 | CR001 | Chinook | 9/19/2003 | 557 | F | Present | Total Length |
| 2003 | CR002 | Chinook | 9/20/2003 | 475 | F | Absent | Total Length |
| 2003 | CR003 | Chinook | 9/20/2003 | 776 | M | Present | Total Length |
| 2003 | CR004 | Chinook | 9/22/2003 | 661 | M | Absent | Total Length |
| 2003 | CR005 | Chinook | 9/23/2003 | 517 | M | Absent | POH |
| 2003 | CR006 | Chinook | 9/26/2003 | 742 | M | Absent | POH |
| 2003 | CR007 | Chinook | 9/26/2003 | 896 | M | Present | POF |
| 2003 | CR008 | Chinook | 9/26/2003 | 682 | M | Absent | POF |
| 2003 | CR009 | Chinook | 9/27/2003 | 863 | M | Absent | POF |
| 2003 | CR010 | Chinook | 9/28/2003 | 586 | M | Present | Total Length |
| 2003 | CR011 | Chinook | 9/29/2003 | 855 | F | Present | Total Length |
| 2003 | CR012 | Chinook | 9/30/2003 | 616 | M | Present | Total Length |
| 2003 | CR013 | Chinook | 9/30/2003 | 816 | M | Present | Total Length |
| 2003 | CR014 | Chinook | 9/30/2003 | 866 | M | Present | Total Length |
| 2003 | CR015 | Chinook | 9/30/2003 | 666 | M | Absent | Total Length |
| 2003 | CR016 | Chinook | 9/30/2003 | 726 | M | Absent | Total Length |
| 2003 | CR017 | Chinook | 9/30/2003 | 726 | M | Absent | Total Length |
| 2003 | CR018 | Chinook | 9/30/2003 | 649 | F | Absent | Total Length |
| 2003 | CR019 | Chinook | 10/1/2003 | 806 | M | Absent | Total Length |
| 2003 | CR021 | Chinook | 10/1/2003 | 676 | M | Absent | Total Length |
| 2003 | CR022 | Chinook | 10/2/2003 | 806 | M | Present | Total Length |
| 2003 | CR023 | Chinook | 10/2/2003 | 796 | M | Absent | Total Length |
| 2003 | CR024 | Chinook | 10/2/2003 | 706 | M | Present | Total Length |
| 2003 | CR025 | Chinook | 10/3/2003 | 766 | M | Present | Total Length |
| 2003 | CR026 | Chinook | 10/4/2003 | 746 | M | Absent | Total Length |
| 2003 | CR027 | Chinook | 10/4/2003 | 686 | M | Absent | Total Length |
| 2003 | CR028 | Chinook | 10/5/2003 | 824 | F | Absent | Total Length |
| 2003 | CR029 | Chinook | 10/5/2003 | 826 | M | Absent | Total Length |
| 2003 | CR030 | Chinook | 10/6/2003 | 803 | F | Absent | Total Length |
| 2003 | CR031 | Chinook | 10/6/2003 | 656 | M | Absent | Total Length |
| 2003 | CR032 | Coho | 10/7/2003 | 547 | F | Present | Total Length |
| 2003 | CR033 | Chinook | 10/7/2003 | 636 | M | Absent | Total Length |
| 2003 | CR034 | Chinook | 10/7/2003 | 547 | F | Present | Total Length |
| 2003 | CR035 | Chinook | 10/7/2003 | 656 | M | Absent | Total Length |
| 2003 | CR036 | Chinook | 10/7/2003 | 676 | M | Absent | Total Length |
| 2003 | CR037 | Chinook | 10/7/2003 | 666 | M | Absent | Total Length |
| 2003 | CR038 | Chinook | 10/7/2003 | 690 | F | Absent | Total Length |
| 2003 | CR039 | Chinook | 10/7/2003 | 706 | M | Absent | Total Length |
| 2003 | CR040 | Chinook | 10/7/2003 | 598 | F | Absent | Total Length |
| 2003 | CR041 | Chinook | 10/7/2003 | 567 | F | Absent | Total Length |
| 2003 | CR042 | Chinook | 10/7/2003 | 616 | M | Absent | Total Length |
| 2003 | CR043 | Chinook | 10/9/2003 | 806 | M | Present | Total Length |
| 2003 | CR044 | Chinook | 10/9/2003 | 676 | M | Absent | Total Length |
| 2003 | CR045 | Chinook | 10/9/2003 | 776 | M | Absent | Total Length |
| 2003 | CR046 | Chinook | 10/9/2003 | 636 | M | Absent | Total Length |
| 2003 | CR047 | Chinook | 10/10/2003 | 726 | M | Absent | Total Length |
| 2003 | CR048 | Chinook | 10/10/2003 | 783 | F | Absent | Total Length |
| 2003 | CR049 | Chinook | 10/10/2003 | 656 | M | Absent | Total Length |
| 2003 | CR050 | Chinook | 10/10/2003 | 826 | M | Present | Total Length |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2003 | CR051 | Chinook | 10/10/2003 | 766 | M | Absent | Total Length |
| 2003 | CR052 | Chinook | 10/10/2003 | 716 | M | Absent | Total Length |
| 2003 | CR053 | Chinook | 10/11/2003 | 566 | M | Absent | Total Length |
| 2003 | CR054 | Chinook | 10/11/2003 | 706 | M | Absent | Total Length |
| 2003 | CR055 | Chinook | 10/11/2003 | 732 | F | Present | Total Length |
| 2003 | CR056 | Chinook | 10/11/2003 | 716 | M | Absent | Total Length |
| 2003 | CR057 | Coho | 10/11/2003 | 551 | M | Present | Total Length |
| 2003 | CR058 | Chinook | 10/11/2003 | 696 | M | Absent | Total Length |
| 2003 | CR059 | Chinook | 10/12/2003 | 786 | M | Present | Total Length |
| 2003 | CR060 | Chinook | 10/12/2003 | 756 | M | Absent | Total Length |
| 2003 | CR061 | Coho | 10/12/2003 | 727 | F | Present | Total Length |
| 2003 | CR062 | Chinook | 10/12/2003 | 736 | M | Present | Total Length |
| 2003 | CR063 | Chinook | 10/12/2003 | 773 | F | Present | Total Length |
| 2003 | CR064 | Chinook | 10/12/2003 | 746 | M | Absent | Total Length |
| 2003 | CR065 | Chinook | 10/12/2003 | 566 | M | Absent | Total Length |
| 2003 | CR066 | Chinook | 10/12/2003 | 741 | M | Absent | Total Length |
| 2003 | CR067 | Chinook | 10/12/2003 | 706 | M | Present | Total Length |
| 2003 | CR068 | Chinook | 10/12/2003 | 776 | M | Absent | Total Length |
| 2003 | CR069 | Chinook | 10/12/2003 | 766 | M | Absent | Total Length |
| 2003 | CR070 | Chinook | 10/13/2003 | 716 | M | Present | Total Length |
| 2003 | CR071 | Chinook | 10/13/2003 | 586 | M | Absent | Total Length |
| 2003 | CR072 | Coho | 10/13/2003 | 706 | F | Present | Total Length |
| 2003 | CR073 | Chinook | 10/13/2003 | 696 | M | Absent | Total Length |
| 2003 | CR074 | Chinook | 10/13/2003 | 706 | M | Absent | Total Length |
| 2003 | CR075 | Coho | 10/13/2003 | 558 | F | Present | Total Length |
| 2003 | CR076 | Coho | 10/14/2003 | 619 | M | Present | Total Length |
| 2003 | CR077 | Chinook | 10/14/2003 | 706 | M | Absent | Total Length |
| 2003 | CR078 | Chinook | 10/14/2003 | 636 | M | Absent | Total Length |
| 2003 | CR079 | Chinook | 10/15/2003 | 865 | F | Absent | Total Length |
| 2003 | CR080 | Chinook | 10/15/2003 | 726 | M | Present | Total Length |
| 2003 | CR081 | Chinook | 10/15/2003 | 716 | M | Present | Total Length |
| 2003 | CR082 | Chinook | 10/15/2003 | 646 | M | Present | Total Length |
| 2003 | CR083 | Chinook | 10/15/2003 | 773 | F | Present | Total Length |
| 2003 | CR084 | Chinook | 10/18/2003 | 611 | M | Absent | Total Length |
| 2003 | CR086 | Coho | 10/19/2003 | 621 | F | Absent | Total Length |
| 2003 | CR085 | Coho | 10/20/2003 | 605 | F | Absent | Total Length |
| 2003 | CR087 | Chinook | 10/20/2003 | 742 | F | Absent | Total Length |
| 2003 | CR088 | Chinook | 10/21/2003 | 796 | M | Absent | Total Length |
| 2003 | CR089 | Coho | 10/21/2003 | 697 | M | Present | Total Length |
| 2003 | CR090 | Coho | 10/21/2003 | 547 | F | Absent | Total Length |
| 2003 | CR091 | Coho | 10/21/2003 | 605 | M | Present | Total Length |
| 2003 | CR092 | Coho | 10/25/2003 | 536 | F | Present | Total Length |
| 2003 | CR093 | Coho | 10/27/2003 | 610 | M | Absent | Total Length |
| 2003 | CR095 | Coho | 10/28/2003 | 688 | M | Present | Total Length |
| 2003 | CR096 | Coho | 11/8/2003 | 649 | M | Present | Total Length |
| 2003 | CR094 | Coho | 11/11/2003 | 526 | F | Present | Total Length |
| 2003 | CR097 | Coho | 11/13/2003 | 527 | M | Present | Total Length |
| 2003 | CR098 | Chum | 11/15/2003 | | M | Present | Total Length |
| 2003 | CR099 | Coho | 11/17/2003 | 529 | F | Present | Total Length |
| 2003 | CR100 | Coho | 11/18/2003 | 668 | M | Present | Total Length |
| 2003 | CR101 | Coho | 11/18/2003 | 503 | M | Present | Total Length |
| 2003 | CR102 | Coho | 11/20/2003 | 674 | F | Present | Total Length |
| 2003 | CR103 | Cutthroat Trout | 11/21/2003 | | U | Present | Total Length |
| 2003 | CR104 | Coho | 11/28/2003 | 706 | F | Present | Total Length |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2003 | CR105 | Coho | 11/29/2003 | 683 | M | Present | Total Length |
| 2003 | CR106 | Coho | 11/29/2003 | 642 | F | Present | Total Length |
| 2003 | CR107 | Coho | 11/29/2003 | 707 | M | Present | Total Length |
| 2003 | CR108 | Coho | 11/29/2003 | 559 | M | Present | Total Length |
| 2003 | CR109 | Coho | 11/29/2003 | 671 | M | Present | Total Length |
| 2003 | CR110 | Coho | 11/29/2003 | 654 | M | Present | Total Length |
| 2003 | CR111 | Coho | 11/30/2003 | 641 | M | Present | Total Length |
| 2003 | CR112 | Coho | 11/30/2003 | 657 | M | Present | Total Length |
| 2003 | CR113 | Coho | 11/30/2003 | 711 | F | Present | Total Length |
| 2003 | CR114 | Coho | 12/1/2003 | 701 | F | Present | Total Length |
| 2003 | CR115 | Coho | 12/1/2003 | 556 | M | Present | Total Length |
| 2003 | CR116 | Coho | 12/1/2003 | 707 | M | Present | Total Length |
| 2003 | CR117 | Coho | 12/1/2003 | 732 | M | Present | Total Length |
| 2003 | CR118 | Coho | 12/2/2003 | 654 | M | Present | Total Length |
| 2003 | CR119 | Coho | 12/5/2003 | 621 | F | Present | Total Length |
| 2003 | CR120 | Coho | 12/6/2003 | 648 | F | Present | Total Length |
| 2003 | CR121 | Dead Coho | 12/6/2003 | 598 | F | Present | Total Length |
| 2003 | CR122 | Coho | 12/13/2003 | 564 | M | Present | Total Length |
| 2003 | CR123 | Coho | 12/14/2003 | 675 | F | Present | Total Length |
| 2003 | CR124 | Coho | 12/15/2003 | 722 | M | Present | Total Length |
| 2003 | CR125 | Coho | 12/19/2003 | 549 | F | Present | Total Length |
| 2003 | CR126 | Coho | 12/19/2003 | 548 | M | Present | Total Length |
| 2003 | CR127 | Coho | 12/19/2003 | 544 | F | Present | Total Length |
| 2003 | CR128 | Coho | 12/19/2003 | 600 | M | Present | Total Length |
| 2003 | CR129 | Coho | 12/21/2003 | 801 | F | Present | Total Length |
| 2003 | CR130 | Coho | 12/21/2003 | 619 | M | Present | Total Length |

**Table A 2: Sockeye counts and distribution from the Cedar River Landsburg Dam Fish Passage Facility in 2003**

| Date | Female Presort Mort. | Male Presort Mort. | Female Sorted | Male Sorted | Female Post Sort Mort. | Male Post Sort Mort. | Female to Hatchery | Male to Hatchery | Female to RM13 | Male to RM13 | Female to Landsburg Park | Male to Landsburg Park |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/16/2003 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9/17/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/18/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/19/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/20/2003 | 1 | 1 | 7 | 13 | 0 | 0 | 0 | 0 | 7 | 13 | 0 | 0 |
| 9/21/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/22/2003 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | 2 | 7 | 0 | 0 |
| 9/23/2003 | 0 | 0 | 7 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/24/2003 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/25/2003 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 11 | 21 | 0 | 0 |
| 9/26/2003 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/27/2003 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/28/2003 | 2 | 0 | 6 | 11 | 0 | 0 | 0 | 0 | 10 | 17 | 0 | 0 |
| 9/29/2003 | 0 | 3 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/30/2003 | 1 | 0 | 4 | 13 | 0 | 0 | 0 | 0 | 8 | 17 | 0 | 0 |
| 10/1/2003 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/2/2003 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 |
| 10/3/2003 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/4/2003 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/5/2003 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/6/2003 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/7/2003 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 3 | 14 | 0 | 0 |
| 10/8/2003 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/9/2003 | 0 | 0 | 5 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/10/2003 | 2 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 6 | 18 | 0 | 0 |
| 10/11/2003 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/12/2003 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 3 | 9 | 0 | 0 |
| 10/13/2003 | 0 | 0 | 10 | 19 | 0 | 1 | 0 | 0 | 10 | 18 | 0 | 0 |
| 10/14/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/15/2003 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/16/2003 | 0 | 2 | 9 | 25 | 0 | 1 | 0 | 24 | 0 | 0 | 0 | 0 |
| 10/17/2003 | 4 | 14 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/18/2003 | 0 | 3 | 2 | 12 | 0 | 0 | 0 | 0 | 2 | 12 | 0 | 0 |
| 10/19/2003 | 2 | 0 | 3 | 19 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/20/2003 | 1 | 0 | 7 | 16 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/21/2003 | 0 | 2 | 12 | 17 | 1 | 2 | 10 | 31 | 0 | 0 | 0 | 0 |
| 10/22/2003 | 0 | 1 | 43 | 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/23/2003 | 3 | 7 | 11 | 28 | 0 | 0 | 54 | 87 | 0 | 0 | 0 | 0 |
| 10/24/2003 | 1 | 2 | 0 | 0 | 0 | 1 | 11 | 27 | 0 | 0 | 0 | 0 |
| 10/25/2003 | 0 | 3 | 11 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/26/2003 | 0 | 1 | 18 | 38 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 |
| 10/27/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 38 | 0 | 0 | 0 | 0 |
| 10/28/2003 | 0 | 2 | 12 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/29/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/30/2003 | 0 | 0 | 3 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/31/2003 | 0 | 0 | 3 | 2 | 0 | 0 | 18 | 36 | 0 | 0 | 0 | 0 |
| 11/1/2003 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Date | Female Presort Mort. | Male Presort Mort. | Female Sorted | Male Sorted | Female Post Sort Mort. | Male Post Sort Mort. | Female to Hatchery | Male to Hatchery | Female to RM13 | Male to RM13 | Female to Landsburg Park | Male to Landsburg Park |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/2/2003 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/3/2003 | 0 | 1 | 9 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/4/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/5/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/6/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/7/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/8/2003 | 0 | 1 | 5 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/9/2003 | 0 | 0 | 6 | 18 | 1 | 0 | 16 | 50 | 0 | 0 | 0 | 0 |
| 11/10/2003 | 0 | 0 | 7 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/11/2003 | 0 | 0 | 7 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/12/2003 | 0 | 0 | 7 | 4 | 0 | 0 | 24 | 50 | 0 | 0 | 0 | 0 |
| 11/13/2003 | 0 | 0 | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/14/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/15/2003 | 0 | 0 | 6 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/16/2003 | 0 | 0 | 5 | 12 | 0 | 0 | 18 | 38 | 0 | 0 | 0 | 0 |
| 11/17/2003 | 1 | 0 | 6 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/18/2003 | 0 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/19/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/20/2003 | 0 | 0 | 1 | 12 | 1 | 0 | 0 | 0 | 7 | 31 | 0 | 0 |
| 11/21/2003 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/22/2003 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/23/2003 | 0 | 0 | 2 | 16 | 0 | 0 | 4 | 36 | 0 | 0 | 0 | 0 |
| 11/24/2003 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/25/2003 | 0 | 0 | 1 | 12 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/26/2003 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 4 | 17 | 0 | 0 |
| 11/27/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/28/2003 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/29/2003 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/30/2003 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 2 | 15 | 0 | 0 |
| 12/1/2003 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/2/2003 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/3/2003 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/4/2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/5/2003 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/6/2003 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 8 | 23 | 0 | 0 |
| 12/7/2003 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 12/8/2003 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 12/9/2003 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| **Subtotal** | **22** | **58** | **283** | **718** | **13** | **13** | **184** | **461** | **87** | **236** | **0** | **8** |

**Table A 3: Analysis of otoliths from sockeye mortalities at the Landsburg Fish Ladder in 2003** (Analysis provided by Washington Department of Fish and Wildlife)

| Date of Mortality | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 9/20/2003 | F | N/A | 1 | 1998 | E1 | 5 |
| 9/20/2003 | M | N/A | 0 | | | 5 |
| 9/24/2003 | M | 581 | 0 | | | 4 |
| 9/24/2003 | F | 565 | 0 | | | 4 |
| 9/29/2003 | M | 660 | 1 | 1998 | M1 | 4 |
| 9/29/2003 | M | 610 | 0 | | | 4 |
| 9/29/2003 | M | 610 | 0 | | | 4 |
| 9/30/2003 | F | 640 | 0 | | | 4 |
| 10/1/2003 | M | 715 | 0 | | | 4 |
| 10/5/2003 | M | 470 | 0 | | | 4 |
| 10/8/2003 | F | 590 | 0 | | | 4 |
| 10/10/2003 | F | 650 | 1 | 1998 | M3 | 5 |
| 10/10/2003 | F | 590 | 0 | | | 5 |
| 10/10/2003 | M | 635 | 0 | | | 4 |
| 10/10/2003 | M | 665 | 1 | 1998 | M1 | 5 |
| 10/10/2003 | M | 740 | 0 | | | 5 |
| 10/10/2003 | M | 635 | 0 | | | 4 |
| 10/13/2003 | M | 610 | 0 | | | 4 |
| 10/15/2003 | F | 630 | 1 | 1998 | M3 | 4 |
| 10/16/2003 | M | 720 | 1 | 1998 | M3 | 4 |
| 10/16/2003 | M | 671 | 1 | 1998 | M1 | 5 |
| 10/17/2003 | M | 650 | 0 | | | 4 |
| 10/17/2003 | M | 635 | 0 | | | 4 |
| 10/17/2003 | M | 430 | 0 | | | 4 |
| 10/17/2003 | M | 610 | 0 | | | 4 |
| 10/17/2003 | M | 620 | 0 | | | 4 |
| 10/17/2003 | M | 695 | 0 | | | 4 |
| 10/17/2003 | M | 645 | 0 | | | 4 |
| 10/17/2003 | F | 610 | 0 | | | 4 |
| 10/17/2003 | F | 605 | 0 | | | 4 |
| 10/17/2003 | F | 570 | 0 | | | 4 |
| 10/17/2003 | F | 595 | 0 | | | 4 |
| 10/17/2003 | F | 590 | 0 | | | 4 |
| 10/17/2003 | M | 670 | 1 | 1999 | E3 | 5 |
| 10/17/2003 | F | 648 | 1 | 1998 | L1 | 5 |
| 10/17/2003 | M | 700 | 1 | 1998 | L2 | 5 |
| 10/17/2003 | F | 600 | 1 | 1999 | E2 | 4 |
| 10/17/2003 | F | 595 | 1 | 1998 | M3 | 5 |
| 10/17/2003 | F | 660 | 1 | 1998 | M1 | 4 |
| 10/17/2003 | M | 700 | 1 | 1998 | L2 | 4 |
| 10/17/2003 | M | 720 | 0 | | | 5 |
| 10/17/2003 | F | 590 | 0 | | | 4 |
| 10/17/2003 | M | 685 | 1 | 1998 | M1 | 5 |
| 10/17/2003 | M | 690 | 0 | | | 5 |
| 10/17/2003 | M | 630 | 0 | | | 4 |
| 10/17/2003 | F | 570 | 0 | | | 4 |
| 10/17/2003 | F | 530 | 0 | | | 4 |

| Date of Mortality | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 10/17/2003 | F | 530 | 0 | | | 4 |
| 10/18/2003 | M | 675 | 1 | 1998 | L1 | 5 |
| 10/18/2003 | M | 690 | 0 | | | 4 |
| 10/18/2003 | M | 625 | 0 | | | 4 |
| 10/19/2003 | M | 640 | 0 | | | 4 |
| 10/19/2003 | M | 605 | 0 | | | 4 |
| 10/19/2003 | F | 590 | 0 | | | 4 |
| 10/19/2003 | F | 570 | 1 | ? | ? | 4 |
| 10/19/2003 | F | 600 | 0 | | | 4 |
| 10/20/2003 | M | 700 | 1 | 1998 | E2 | 4 |
| 10/20/2003 | M | 570 | 0 | | | 4 |
| 10/20/2003 | M | 680 | 0 | | | 5 |
| 10/20/2003 | F | 560 | 0 | | | 4 |
| 10/21/2003 | M | 670 | 1 | 1998 | M1 | 4 |
| 10/21/2003 | M | 630 | 0 | | | 4 |
| 10/21/2003 | M | 690 | 1 | 1998 | M1 | 5 |
| 10/21/2003 | M | 660 | 1 | 1998 | M3 | 5 |
| 10/22/2003 | M | 630 | 1 | 1998 | M1 | 5 |
| 10/23/2003 | M | 620 | 1 | 1998 | E2 | 4 |
| 10/23/2003 | M | 645 | 1 | 1998 | M3 | 5 |
| 10/23/2003 | M | 650 | 1 | 1998 | L1 | 5 |
| 10/23/2003 | M | 630 | 0 | | | 4 |
| 10/23/2003 | M | 650 | 0 | | | 4 |
| 10/23/2003 | F | 490 | 0 | | | 4 |
| 10/23/2003 | F | 600 | 0 | | | 4 |
| 10/23/2003 | F | 570 | 0 | | | 4 |
| 10/23/2003 | M | 690 | 1 | 1998 | M3 | 5 |
| 10/23/2003 | M | 670 | 1 | 1998 | M3 | 4 |
| 10/25/2003 | M | 705 | 0 | | | VAT |
| 10/25/2003 | M | 600 | 0 | | | 5 |
| 10/25/2003 | M | 580 | 1 | 1999 | M2 | 4 |
| 10/26/2003 | M | 660 | 1 | 1998 | L2 | 4 |
| 10/28/2003 | M | 600 | 0 | | | 4 |
| 10/28/2003 | M | 710 | 0 | | | 4 |
| 11/1/2003 | M | 675 | 0 | | | 4 |
| 11/2/2003 | M | 620 | 0 | | | 4 |
| 11/2/2003 | M | 640 | 0 | | | 4 |
| 11/3/2003 | M | 615 | 0 | | | 4 |
| 11/8/2003 | M | 647 | 0 | | | 4 |
| 11/9/2003 | F | 560 | 0 | | | 4 |
| 11/17/2003 | F | 610 | 0 | | | 4 |
| 11/18/2003 | M | 690 | 1 | 1998 | L3 | 5 |
| 11/28/2003 | M | 580 | 0 | | | 4 |
| N/A | F | N/A | 1 | 1998 | E1 | 5 |
| N/A | M | 610 | 1 | 1999 | E3 | 4 |
| Total Hatchery Fish | | | 32 (35%) | | | |
| Total Natural Production | | | 60 (65%) | | | |

**Table A 4: Analysis of otoliths from sockeye at the Landsburg Fish Passage that were used for broodstock at the Cedar River Sockeye Hatchery in 2003**
(Analysis provided by Washington Department of Fish and Wildlife)

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 10/20/2003 | F | 640 | 1 | 1998 | M2 | 5 |
| 10/23/2003 | M | 690 | 1 | 1998 | M3 | 5 |
| 10/23/2003 | M | 650 | 1 | 1998 | M1 | 5 |
| 10/23/2003 | M | 580 | 1 | 1999 | E3 | 4 |
| 10/23/2003 | M | 710 | 1 | 1998 | L3 | 5 |
| 10/23/2003 | M | 670 | 1 | 1998 | M3 | 4 |
| 10/23/2003 | M | 700 | 0 | | | 4 |
| 10/23/2003 | M | 660 | 1 | 1999 | E3 | 4 |
| 10/23/2003 | M | 520 | 1 | 2000 | E1 | 4 |
| 10/23/2003 | M | 620 | 0 | | | 4 |
| 10/23/2003 | M | 600 | 1 | 1999 | M2 | 4 |
| 10/23/2003 | M | 640 | 1 | 1999 | E2 | 4 |
| 10/23/2003 | F | 580 | 0 | | | 5 |
| 10/23/2003 | F | 550 | 999 | | | |
| 10/23/2003 | F | 600 | 0 | | | 5 |
| 10/23/2003 | F | 560 | 0 | | | 4 |
| 10/23/2003 | F | 620 | 0 | | | 4 |
| 10/24/2003 | M | 610 | 1 | 1999 | M2 | 4 |
| 10/24/2003 | M | 660 | 1 | 1998 | M3 | 5 |
| 10/24/2003 | M | 630 | 1 | 1998 | M1 | 5 |
| 10/26/2003 | M | 600 | 1 | 1999 | M2 | 4 |
| 10/26/2003 | M | 700 | 1 | 1998 | M3 | 5 |
| 10/26/2003 | M | 610 | 0 | | | 5 |
| 10/26/2003 | M | 700 | 1 | 1998 | L2 | VAT |
| 10/26/2003 | M | 570 | 1 | 1998 | M3 | 5 |
| 10/26/2003 | M | 690 | 0 | | | 5 |
| 10/26/2003 | M | 700 | 1 | 1998 | L1 | 4 |
| 10/26/2003 | F | 600 | 1 | 1998 | L2 | 5 |
| 10/26/2003 | F | 550 | 1 | 1998 | L2 | 5 |
| 10/26/2003 | F | 660 | 1 | 1998 | L1 | 5 |
| 10/26/2003 | F | 580 | 0 | | | 4 |
| 10/26/2003 | F | 630 | 1 | 1998 | L1 | 4 |
| 10/26/2003 | F | 600 | 0 | | | 4 |
| 10/26/2003 | F | 650 | 0 | | | 5 |
| 10/26/2003 | F | 630 | 1 | 1998 | L1 | 5 |
| 10/26/2003 | F | 630 | 0 | | | 5 |
| 10/26/2003 | F | 540 | 1 | 1998 | M3 | 4 |
| 10/26/2003 | F | 620 | 1 | 1998 | E2 | 5 |
| 10/26/2003 | F | 620 | 1 | 1998 | M3 | 5 |
| 10/26/2003 | F | 600 | 1 | 1998 | M1 | 5 |
| 10/26/2003 | F | 630 | 1 | 1998 | M3 | 4 |
| 10/26/2003 | F | 620 | 1 | 1998 | M1 | 5 |
| 10/26/2003 | F | 560 | 0 | | | 4 |
| 10/26/2003 | F | 610 | 1 | 1998 | L2 | 5 |
| 10/26/2003 | F | 680 | 1 | 1998 | M3 | 4 |
| 10/26/2003 | F | 640 | 1 | 1998 | M2 | 5 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 10/26/2003 | F | 580 | 0 | | | 4 |
| 10/26/2003 | F | 640 | 1 | 1998 | M3 | 5 |
| 10/26/2003 | F | 620 | 0 | | | 4 |
| 10/26/2003 | F | 640 | 1 | 1998 | L1 | 5 |
| 10/26/2003 | N/A | 550 | 0 | | | 4 |
| 10/26/2003 | F | N/A | 0 | | | 4 |
| 10/29/2003 | M | 720 | 1 | 1998 | E2 | 5 |
| 10/29/2003 | M | 790 | 1 | 1998 | L2 | 5 |
| 10/29/2003 | M | 575 | 0 | | | 4 |
| 10/29/2003 | M | 635 | 0 | | | 4 |
| 10/29/2003 | M | 730 | 1 | 1998 | M2 | 4 |
| 10/29/2003 | M | 670 | 1 | 1998 | M1 | VAT |
| 10/29/2003 | M | 735 | 0 | | | 4 |
| 10/29/2003 | M | 685 | 0 | | | 4 |
| 10/30/2003 | M | 650 | 1 | 1998 | L1 | 5 |
| 10/30/2003 | M | 640 | 0 | | | 4 |
| 10/30/2003 | M | 660 | 0 | | | 4 |
| 10/30/2003 | M | 710 | 0 | | | 4 |
| 10/30/2003 | M | 640 | 0 | | | 4 |
| 10/30/2003 | M | 620 | 1 | 1998 | L1 | 4 |
| 10/30/2003 | M | 670 | 1 | 1998 | L1 | 5 |
| 10/30/2003 | M | 700 | 0 | | | 5 |
| 10/30/2003 | M | 680 | 0 | | | 5 |
| 10/30/2003 | M | 660 | 0 | | | 4 |
| 10/30/2003 | M | 590 | 0 | | | 4 |
| 10/30/2003 | M | 580 | 1 | 1998 | M1 | 4 |
| 10/30/2003 | M | 700 | 1 | 1998 | L2 | 4 |
| 10/30/2003 | M | 710 | 1 | 1998 | E2 | 4 |
| 10/30/2003 | M | 620 | 0 | | | 4 |
| 10/30/2003 | M | 710 | 0 | | | 4 |
| 10/30/2003 | M | 721 | 0 | | | 4 |
| 10/30/2003 | M | 640 | 0 | | | 4 |
| 10/30/2003 | M | 570 | 1 | 1999 | E3 | 4 |
| 10/30/2003 | M | 630 | 0 | | | 4 |
| 10/30/2003 | M | 641 | 1 | 1998 | M1 | 5 |
| 10/30/2003 | M | 600 | 0 | | | 4 |
| 10/30/2003 | M | 611 | 1 | 1998 | L3 | 4 |
| 10/30/2003 | M | 620 | 1 | 1998 | M2 | 4 |
| 10/30/2003 | M | 671 | 0 | | | 5 |
| 10/30/2003 | M | 700 | 0 | | | 5 |
| 10/30/2003 | M | 610 | 0 | | | 4 |
| 10/30/2003 | M | 651 | 0 | | | 5 |
| 10/30/2003 | M | 660 | 1 | 1998 | M3 | 4 |
| 10/30/2003 | M | 700 | 1 | 1998 | M3 | 5 |
| 10/30/2003 | M | 640 | 0 | | | 4 |
| 10/30/2003 | M | 610 | 0 | | | |
| 10/30/2003 | M | 680 | 1 | 1998 | M3 | 5 |
| 10/30/2003 | M | 710 | 0 | | | 4 |
| 10/30/2003 | M | 611 | 0 | | | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 10/30/2003 | M | 650 | 0 | | | 4 |
| 10/30/2003 | M | 690 | 999 | | | |
| 11/3/2003 | M | 720 | 1 | 1998 | L2 | 5 |
| 11/3/2003 | M | 720 | 0 | | | 5 |
| 11/3/2003 | M | 670 | 0 | | | 5 |
| 11/3/2003 | F | 550 | 0 | | | 4 |
| 11/3/2003 | F | 675 | 0 | | | 5 |
| 11/3/2003 | F | 605 | 0 | | | 4 |
| 11/3/2003 | M | 635 | 0 | | | 4 |
| 11/3/2003 | M | 650 | 0 | | | 4 |
| 11/3/2003 | F | 535 | 0 | | | 4 |
| 11/3/2003 | M | 705 | 1 | 1998 | L1 | 5 |
| 11/3/2003 | M | 590 | 0 | | | 4 |
| 11/3/2003 | M | 690 | 1 | 1998 | L1 | 5 |
| 11/3/2003 | F | 640 | 1 | 1998 | E2 | 5 |
| 11/3/2003 | F | 600 | 0 | | | 4 |
| 11/3/2003 | M | 575 | 0 | | | 4 |
| 11/3/2003 | M | 630 | 0 | | | 5 |
| 11/3/2003 | F | 510 | 0 | | | 4 |
| 11/3/2003 | M | 470 | 1 | 2000 | L1 | 4 |
| 11/3/2003 | F | 590 | 1 | 1998 | L1 | 5 |
| 11/3/2003 | F | 640 | 0 | | | 4 |
| 11/3/2003 | M | 611 | 1 | 1998 | L2 | 5 |
| 11/3/2003 | F | 641 | 1 | 1998 | L1 | 4 |
| 11/3/2003 | M | 670 | 1 | 1998 | M1 | 5 |
| 11/3/2003 | M | 685 | 0 | | | 4 |
| 11/3/2003 | M | 695 | 1 | 1998 | M1 | 4 |
| 11/3/2003 | M | 630 | 999 | | | |
| 11/3/2003 | M | 625 | 1 | 1998 | L1 | 4 |
| 11/3/2003 | M | 620 | 0 | | | 4 |
| 11/3/2003 | M | 720 | 1 | 1998 | L2 | 4 |
| 11/3/2003 | F | 611 | 1 | 1998 | L1 | 4 |
| 11/3/2003 | M | 665 | 1 | 1999 | M2 | 4 |
| 11/3/2003 | F | 585 | 0 | | | 4 |
| 11/3/2003 | M | 700 | 1 | 1998 | M3 | 5 |
| 11/3/2003 | M | 620 | 0 | | | 4 |
| 11/3/2003 | M | 695 | 1 | 1998 | L1 | 4 |
| 11/3/2003 | F | 605 | 1 | 1998 | L1 | 4 |
| 11/3/2003 | M | 690 | 0 | | | 5 |
| 11/3/2003 | M | 675 | 1 | 1998 | M2 | 4 |
| 11/3/2003 | F | 610 | 0 | | | 4 |
| 11/3/2003 | F | 610 | 0 | | | 4 |
| 11/3/2003 | M | 640 | 0 | | | 4 |
| 11/3/2003 | F | 580 | 0 | | | 4 |
| 11/3/2003 | M | 691 | 1 | 1998 | M2 | 5 |
| 11/3/2003 | F | 570 | 1 | 1999 | M2 | 4 |
| 11/3/2003 | M | 701 | 0 | | | 5 |
| 11/3/2003 | M | 600 | 0 | | | 4 |
| 11/3/2003 | M | 620 | 1 | 1999 | M2 | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/3/2003 | F | 630 | 1 | 1998 | M2 | 5 |
| 11/3/2003 | M | 630 | 1 | 1998 | E3 | 4 |
| 11/3/2003 | M | 600 | 1 | 1998 | M1 | VAT |
| 11/3/2003 | F | 650 | 1 | 1998 | L2 | 4 |
| 11/3/2003 | F | 620 | 1 | 1998 | L1 | 4 |
| 11/3/2003 | M | 700 | 0 | | | VAT |
| 11/3/2003 | F | 600 | 0 | | | 4 |
| 11/3/2003 | M | 580 | 0 | | | 4 |
| 11/3/2003 | M | 630 | 1 | 1998 | M2 | 4 |
| 11/3/2003 | M | 670 | 0 | | | 4 |
| 11/3/2003 | M | 640 | 1 | 1998 | L2 | 5 |
| 11/3/2003 | F | 630 | 1 | 1998 | L1 | 5 |
| 11/3/2003 | F | 610 | 1 | 1998 | L1 | 5 |
| 11/3/2003 | M | 620 | 0 | | | 4 |
| 11/3/2003 | M | 660 | 1 | 1998 | M2 | 4 |
| 11/3/2003 | M | 580 | 1 | 1999 | M2 | 4 |
| 11/3/2003 | M | 580 | 1 | 1999 | M2 | 4 |
| 11/3/2003 | M | 680 | 999 | | | |
| 11/3/2003 | F | 520 | 999 | | | |
| 11/3/2003 | F | 540 | 0 | | | 4 |
| 11/3/2003 | M | 670 | 0 | | | 5 |
| 11/3/2003 | F | 590 | 0 | | | 4 |
| 11/3/2003 | M | 680 | 0 | | | 5 |
| 11/3/2003 | F | 700 | 0 | | | 5 |
| 11/3/2003 | F | 550 | 0 | | | 4 |
| 11/3/2003 | M | 620 | 0 | | | 4 |
| 11/3/2003 | F | 641 | 0 | | | 4 |
| 11/3/2003 | F | 610 | 1 | 1998 | L2 | 4 |
| 11/3/2003 | M | 440 | 0 | | | 4 |
| 11/6/2003 | F | 650 | 0 | | | 5 |
| 11/6/2003 | M | 610 | 1 | 1998 | M2 | 4 |
| 11/6/2003 | F | 580 | 1 | 1998 | M2 | 4 |
| 11/6/2003 | M | 610 | 999 | | | |
| 11/6/2003 | F | 670 | 0 | | | 5 |
| 11/6/2003 | M | 610 | 0 | | | 4 |
| 11/6/2003 | F | 600 | 0 | | | 4 |
| 11/6/2003 | F | 580 | 1 | 1998 | M3 | 4 |
| 11/6/2003 | F | 680 | 0 | | | 4 |
| 11/6/2003 | F | 591 | 999 | | | |
| 11/6/2003 | M | 740 | 1 | 1998 | E3 | 4 |
| 11/6/2003 | M | 615 | 0 | | | 4 |
| 11/6/2003 | M | 711 | 0 | | | 4 |
| 11/6/2003 | M | 660 | 1 | 1998 | M2 | 4 |
| 11/6/2003 | F | 589 | 0 | | | 4 |
| 11/6/2003 | M | 610 | 1 | 1998 | L1 | 4 |
| 11/6/2003 | F | 560 | 0 | | | 4 |
| 11/6/2003 | F | 580 | 0 | | | 4 |
| 11/6/2003 | F | 560 | 0 | | | 4 |
| 11/6/2003 | F | 540 | 0 | | | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/6/2003 | F | 610 | 1 | 1998 | M3 | 5 |
| 11/6/2003 | M | 490 | 1 | 2000 | L1 | 4 |
| 11/6/2003 | F | 490 | 1 | 1999 | M2 | 4 |
| 11/6/2003 | F | 540 | 0 | | | 4 |
| 11/6/2003 | F | 510 | 0 | | | 4 |
| 11/6/2003 | F | 620 | 0 | | | 4 |
| 11/6/2003 | F | 590 | 1 | 1998 | L1 | 5 |
| 11/6/2003 | F | 550 | 1 | 1999 | E2 | 4 |
| 11/6/2003 | F | 570 | 1 | 1998 | M2 | 4 |
| 11/6/2003 | F | 590 | 0 | | | 5 |
| 11/6/2003 | M | 640 | 0 | | | 4 |
| 11/6/2003 | M | 670 | 1 | 1998 | L1 | 4 |
| 11/6/2003 | F | 550 | 1 | 1998 | M1 | 4 |
| 11/6/2003 | M | 630 | 0 | | | 4 |
| 11/6/2003 | M | 660 | 0 | | | 4 |
| 11/6/2003 | M | 560 | 0 | | | 4 |
| 11/6/2003 | F | 570 | 0 | | | 5 |
| 11/6/2003 | F | 590 | 999 | | | |
| 11/6/2003 | M | 620 | 1 | 1998 | M2 | 5 |
| 11/6/2003 | M | 620 | 1 | 1998 | L2 | 5 |
| 11/6/2003 | F | 620 | 0 | | | 4 |
| 11/6/2003 | F | 630 | 1 | 1998 | M2 | 4 |
| 11/6/2003 | F | 560 | 1 | 1998 | M3 | 4 |
| 11/6/2003 | F | 500 | 0 | | | 4 |
| 11/6/2003 | M | 560 | 0 | | | 4 |
| 11/6/2003 | M | 625 | 1 | 1998 | M1 | 4 |
| 11/6/2003 | F | 575 | 0 | | | 4 |
| 11/6/2003 | M | 672 | 1 | 1998 | M3 | 4 |
| 11/6/2003 | M | 567 | 0 | | | 4 |
| 11/6/2003 | F | 571 | 0 | | | 4 |
| 11/6/2003 | F | 610 | 0 | | | 5 |
| 11/6/2003 | M | 578 | 999 | | | |
| 11/6/2003 | M | 594 | 0 | | | 4 |
| 11/6/2003 | M | 595 | 1 | 1999 | E3 | 4 |
| 11/6/2003 | F | 469 | 0 | | | 4 |
| 11/6/2003 | M | 635 | ~~0~~ | - | - | 4 |
| 11/6/2003 | F | 623 | 1 | 1998 | M2 | 4 |
| 11/6/2003 | F | 538 | 0 | | | 4 |
| 11/6/2003 | M | 634 | 1 | 1998 | L1 | 4 |
| 11/6/2003 | M | 626 | 0 | | | 4 |
| 11/6/2003 | M | 611 | 1 | 1998 | L1 | 4 |
| 11/6/2003 | M | 620 | 0 | | | 4 |
| 11/6/2003 | M | 619 | 1 | 1998 | L1 | 5 |
| 11/6/2003 | M | 605 | 1 | 1999 | M2 | 4 |
| 11/6/2003 | M | 642 | 0 | | | 5 |
| 11/6/2003 | M | 656 | 1 | 1998 | E2 | 4 |
| 11/6/2003 | M | 585 | 0 | | | 4 |
| 11/6/2003 | M | 615 | 0 | | | 4 |
| 11/6/2003 | F | 600 | 1 | 1998 | L1 | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/6/2003 | M | 600 | 1 | 1998 | M3 | 4 |
| 11/6/2003 | M | 678 | 0 | | | 4 |
| 11/6/2003 | M | 565 | 0 | | | 4 |
| 11/6/2003 | M | 645 | 0 | | | 5 |
| 11/6/2003 | M | 605 | 0 | | | 4 |
| 11/6/2003 | M | 630 | 0 | | | 4 |
| 11/6/2003 | M | 650 | 0 | | | 4 |
| 11/6/2003 | M | 620 | 1 | 1999 | E2 | 4 |
| 11/6/2003 | M | 462 | 0 | | | 4 |
| 11/6/2003 | M | 555 | 1 | 1999 | M2 | 4 |
| 11/6/2003 | M | 600 | 1 | 1998 | L2 | 4 |
| 11/6/2003 | F | 635 | 1 | 1998 | L1 | 4 |
| 11/6/2003 | M | 440 | 0 | | | 4 |
| 11/6/2003 | M | 545 | 1 | 1998 | E2 | 4 |
| 11/6/2003 | M | 645 | 0 | | | 5 |
| 11/6/2003 | M | 555 | 0 | | | 4 |
| 11/6/2003 | M | 618 | 1 | 1998 | L1 | 4 |
| 11/6/2003 | M | 596 | 0 | | | 4 |
| 11/6/2003 | M | 615 | 0 | | | 4 |
| 11/6/2003 | M | 595 | 0 | | | 4 |
| 11/6/2003 | M | 605 | 0 | | | 4 |
| 11/6/2003 | M | 670 | 0 | | | 4 |
| 11/6/2003 | M | 665 | 0 | | | 4 |
| 11/6/2003 | M | 675 | 1 | 1998 | L1 | 5 |
| 11/6/2003 | M | 665 | 1 | 1998 | M3 | 5 |
| 11/10/2003 | F | 620 | 0 | | | 5 |
| 11/10/2003 | F | 520 | 1 | 1999 | M2 | 4 |
| 11/10/2003 | F | 618 | 0 | | | 5 |
| 11/ 10/2003 | F | 638 | 0 | | | 4 |
| 11/10/2003 | F | 600 | 1 | 1998 | L1 | 5 |
| 11/10/2003 | F | 590 | 1 | 1998 | L3 | 4 |
| 11/10/2003 | F | 511 | 0 | | | 4 |
| 11/10/2003 | F | 555 | 0 | | | 4 |
| 11/10/2003 | M | 700 | 0 | | | 5 |
| 11/10/2003 | F | 600 | 999 | | | |
| 11/10/2003 | F | 555 | 0 | | | 4 |
| 11/10/2003 | F | 565 | 0 | | | 4 |
| 11/10/2003 | F | 557 | 0 | | | 4 |
| 11/10/2003 | F | 629 | 0 | | | 5 |
| 11/10/2003 | F | 618 | 1 | 1998 | L1 | 5 |
| 11/10/2003 | M | 620 | 999 | | | 4 |
| 11/10/2003 | M | 580 | 0 | | | 4 |
| 11/10/2003 | M | 508 | 0 | | | 4 |
| 11/10/2003 | M | 580 | 1 | 1998 | M1 | 4 |
| 11/10/2003 | F | 610 | 1 | 1998 | L2 | 4 |
| 11/10/2003 | F | 571 | 0 | | | 4 |
| 11/10/2003 | M | 620 | 1 | 1998 | L1 | 4 |
| 11/10/2003 | F | 590 | 0 | | | 5 |
| 11/10/2003 | F | 640 | 0 | | | 5 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/10/2003 | F | 600 | 1 | 1998 | E2 | 5 |
| 11/10/2003 | F | 540 | 0 | | | 4 |
| 11/10/2003 | M | 640 | 0 | | | 4 |
| 11/10/2003 | M | 541 | 0 | | | 4 |
| 11/10/2003 | M | 610 | 0 | | | 4 |
| 11/10/2003 | M | 540 | 999 | | frag | 4 |
| 11/10/2003 | F | 531 | 0 | | | 4 |
| 11/10/ 2003 | M | 621 | 0 | | | 5 |
| 11/10/2003 | M | 615 | 1 | 1998 | L1 | 4 |
| 11/10/2003 | M | 630 | 1 | 1998 | M3 | 4 |
| 11/10/2003 | M | 615 | 0 | | | 4 |
| 11/10/2003 | F | 510 | 1 | 1999 | E3 | 4 |
| 11/10/2003 | M | 635 | 1 | 1998 | M3 | 4 |
| 11/10/2003 | F | 575 | 0 | | | 4 |
| 11/10/2003 | M | 630 | 1 | 1998 | M2 | 5 |
| 11/10/2003 | M | 580 | 0 | | | 4 |
| 11/10/2003 | M | 645 | 0 | | | 4 |
| 11/13/2003 | F | 600 | 1 | 1998 | L1 | 4 |
| 11/13/2003 | F | 670 | 0 | | | 4 |
| 11/13/2003 | F | 610 | 0 | | | 4 |
| 11/13/2003 | F | 575 | 0 | | | 4 |
| 11/13/2003 | F | 621 | 1 | 1998 | L1 | 4 |
| 11/13/2003 | F | 640 | 0 | | | 4 |
| 11/13/2003 | F | 630 | 0 | | | 4 |
| 11/13/2003 | F | 580 | 0 | | | 4 |
| 11/13/2003 | F | 580 | 0 | | | 4 |
| 11/13/2003 | F | 610 | 1 | 1998 | L1 | 5 |
| 11/13/2003 | F | 600 | 0 | | | 4 |
| 11/13/2003 | F | 625 | ~~0~~ | | | |
| 11/13/2003 | F | 590 | 0 | | | 4 |
| 11/13/2003 | F | 620 | 0 | | | 4 |
| 11/13/2003 | F | 618 | 1 | 1998 | L2 | 5 |
| 11/13/2003 | F | 553 | 0 | | | 4 |
| 11/13/2003 | F | N/A | 0 | | | 4 |
| 11/13/2003 | M | 683 | 1 | 1998 | L2 | 4 |
| 11/13/ 2003 | F | 565 | 0 | | | 4 |
| 11/13/2003 | F | 552 | 0 | | | 4 |
| 11/13/2003 | M | 598 | 0 | | | 4 |
| 11/13/2003 | M | 635 | 0 | | | 4 |
| 11/13/2003 | M | 634 | 0 | | | 4 |
| 11/13/2003 | M | 623 | 0 | | | 4 |
| 11/13/2003 | M | 685 | 0 | | | 5 |
| 11/13/2003 | M | 586 | 0 | | | 4 |
| 11/13/2003 | M | 655 | 1 | 1998 | M3 | 4 |
| 11/13/2003 | M | 530 | 0 | | | 4 |
| 11/13/2003 | M | 645 | 0 | | | 5 |
| 11/13/2003 | M | 612 | 0 | | | 4 |
| 11/13/2003 | M | 695 | 1 | 1998 | L1 | 4 |
| 11/13/2003 | M | 679 | 0 | | | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/13/2003 | M | 703 | 0 | | | 5 |
| 11/13/2003 | M | 640 | 0 | | | 5 |
| 11/13/2003 | M | 668 | 1 | 1998 | L1 | 4 |
| 11/13/2003 | M | 658 | 1 | 1998 | L1 | 4 |
| 11/13/2003 | M | 543 | 0 | | | 4 |
| 11/13/2003 | M | 635 | 0 | | | 5 |
| 11/13/2003 | M | 635 | 1 | 1998 | L2 | 5 |
| 11/13/2003 | M | 538 | 0 | | | 4 |
| 11/13/2003 | M | 630 | 0 | | | 4 |
| 11/13/2003 | M | 590 | 0 | | | 5 |
| 11/13/2003 | M | 658 | 0 | | | 5 |
| 11/13/2003 | M | 618 | 0 | | | 4 |
| 11/13/2003 | M | 650 | 1 | 1998 | M3 | 4 |
| 11/13/2003 | M | 655 | 1 | 1998 | L1 | 4 |
| 11/13/2003 | M | 495 | 0 | | | 4 |
| 11/17/2003 | M | 610 | 0 | | | 4 |
| 11/17/2003 | M | 606 | 0 | | | 4 |
| 11/17/2003 | M | 618 | 0 | | | 4 |
| 11/17/2003 | M | 638 | 1 | 1998 | M2 | 4 |
| 11/17/2003 | M | 628 | 1 | 1998 | L2 | 4 |
| 11/17/2003 | M | 619 | 0 | | | 4 |
| 11/17/2003 | M | 655 | 0 | | | 5 |
| 11/17/2003 | M | 600 | 1 | 1998 | L2 | 4 |
| 11/17/2003 | M | 600 | 0 | | | 4 |
| 11/17/2003 | M | 629 | 0 | | | 4 |
| 11/17/2003 | M | 627 | 0 | | | 4 |
| 11/17/2003 | M | 530 | 0 | | | 4 |
| 11/17/2003 | M | 660 | 0 | | | 4 |
| 11/17/2003 | M | 655 | 0 | | | 4 |
| 11/17/2003 | M | 598 | 0 | | | 4 |
| 11/17/2003 | M | 592 | 0 | | | 4 |
| 11/17/2003 | M | 637 | 0 | | | 4 |
| 11/17/2003 | M | 575 | 0 | | | 4 |
| 11/17/2003 | M | 598 | 0 | | | 4 |
| 11/17/2003 | M | 643 | 1 | 1998 | L1 | 4 |
| 11/17/2003 | M | 672 | 1 | 1998 | L1 | 5 |
| 11/17/2003 | M | 575 | 1 | 1999 | M2 | 4 |
| 11/17/2003 | M | 628 | 0 | | | 5 |
| 11/17/2003 | M | 580 | 0 | | | 5 |
| 11/17/2003 | M | 645 | 0 | | | 4 |
| 11/17/2003 | F | 590 | 0 | | | 4 |
| 11/17/2003 | M | 680 | 0 | | | 4 |
| 11/17/2003 | F | 630 | 0 | | | 4 |
| 11/17/2003 | F | 580 | 0 | | | 4 |
| 11/17/2003 | F | 555 | 0 | | | 4 |
| 11/17/2003 | F | 615 | 0 | | | 4 |
| 11/17/2003 | F | 560 | 0 | | | 4 |
| 11/17/2003 | F | 645 | 0 | | | 4 |
| 11/17/2003 | F | 605 | 0 | | | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/17/2003 | F | 540 | 0 | | | 4 |
| 11/17/2003 | F | 655 | 0 | | | 5 |
| 11/17/2003 | F | 650 | 0 | | | 5 |
| 11/17/2003 | F | 665 | 0 | | | 5 |
| 11/17/2003 | F | 610 | 0 | | | 4 |
| 11/17/2003 | F | 630 | 0 | | | 4 |
| 11/17/2003 | F | 630 | 0 | | | 5 |
| 11/24/2003 | M | 618 | 1 | 1998 | L1 | 5 |
| 11/24/2003 | M | 608 | 1 | 1998 | L1 | 5 |
| 11/24/2003 | M | 618 | 0 | | | 5 |
| 11/24/2003 | M | 677 | 0 | | | 4 |
| 11/24/2003 | M | 618 | 0 | | | 4 |
| 11/24/2003 | M | 461 | 999 | | | |
| 11/24/2003 | M | 628 | 1 | 1998 | L1 | 4 |
| 11/24/2003 | M | 662 | 0 | | | 4 |
| 11/24/2003 | M | 560 | 0 | | | 4 |
| 11/24/2003 | M | 558 | 0 | | | 4 |
| 11/24/2003 | M | 639 | 1 | 1998 | L1 | 5 |
| 11/24/2003 | M | 635 | 999 | | | |
| 11/24/2003 | M | 623 | 1 | 1998 | L2 | 4 |
| 11/24/2003 | M | 668 | 1 | 1998 | L2 | 5 |
| 11/24/2003 | M | 648 | 0 | | | 4 |
| 11/24/2003 | M | 668 | 0 | | | 4 |
| 11/24/2003 | M | 628 | 1 | 1998 | L1 | 5 |
| 11/24/2003 | M | 892 | 0 | | | 5 |
| 11/24/2003 | M | 665 | 0 | | | 4 |
| 11/24/2003 | M | 568 | 0 | | | 4 |
| 11/24/2003 | M | 595 | 0 | | | 4 |
| 11/24/2003 | M | 565 | 0 | | | 4 |
| 11/24/2003 | M | 650 | 0 | | | 4 |
| 11/24/2003 | M | 660 | 0 | | | 4 |
| 11/24/2003 | M | 422 | 0 | | | 4 |
| 11/24/2003 | M | 620 | 0 | | | 4 |
| 11/24/2003 | M | 650 | 0 | | | 4 |
| 11/24/2003 | M | 595 | 0 | | | 4 |
| 11/24/2003 | M | 630 | 0 | | | 4 |
| 11/24/2003 | M | 620 | 0 | | | 4 |
| 11/24/2003 | M | 645 | 0 | | | 4 |
| 11/24/2003 | F | 600 | 0 | | | 4 |
| 11/24/2003 | F | 560 | 0 | | | 4 |
| 11/24/2003 | F | 555 | 0 | | | 4 |
| 11/24/2003 | M | 600 | 1 | 1998 | L2 | 4 |
| 11/24/2003 | M | 615 | 1 | 1998 | L1 | 4 |
| 11/24/2003 | M | 655 | 0 | | | 4 |
| 11/24/2003 | F | 610 | 0 | | | 5 |
| 11/24/2003 | M | 580 | 0 | | | 4 |
| 11/24/2003 | F | 635 | 0 | | | 4 |
| 11/24/2003 | F | 605 | 1 | 1998 | L2 | 5 |
| 11/24/2003 | F | 530 | 0 | | | 4 |

| Date of Otolith Removal | Sex | Total Length (mm) | Mark Status 1=hatchery 0=Natural Prod. | Brood Year | Fry Release Location | Otolith Age |
|---|---|---|---|---|---|---|
| 11/24/2003 | F | 490 | 0 | | | 4 |
| 11/24/2003 | F | 540 | 0 | | | 4 |
| 11/24/2003 | F | 560 | 0 | | | 4 |
| 11/24/2003 | M | 615 | 0 | | | 4 |
| 11/24/2003 | F | 550 | 0 | | | 4 |
| 11/24/2003 | F | 570 | 0 | | | 4 |
| 11/24/2003 | F | 540 | 0 | | | 4 |
| 11/24/2003 | M | 595 | 0 | | | 4 |
| 11/24/2003 | M | 660 | 1 | 1998 | L2 | 5 |
| 11/24/2003 | M | 655 | 0 | | | 5 |
| 11/24/2003 | F | 620 | 1 | 1998 | M3 | 5 |
| 11/24/2003 | F | 620 | 1 | 1998 | M2 | 4 |
| 11/24/2003 | F | 560 | 0 | | | 4 |
| 12/2/2003 | M | 600 | 0 | | | 4 |
| 12/2/2003 | M | 620 | 0 | | | 4 |
| 12/2/2003 | M | 620 | 0 | | | 4 |
| 12/2/2003 | M | 575 | 0 | | | 4 |
| 12/2/2003 | M | 655 | 0 | | | 5 |
| 12/2/2003 | F | 565 | 0 | | | 4 |
| 12/2/2003 | M | 630 | 1 | 1998 | L1 | 4 |
| 12/2/2003 | F | 555 | 0 | | | 4 |
| 12/2/2003 | M | 665 | 0 | | | 4 |
| 12/2/2003 | M | 650 | 1 | 1998 | L1 | 4 |
| 12/2/2003 | M | 710 | 0 | | | 4 |
| 12/2/2003 | M | 615 | 0 | | | 4 |
| 12/2/2003 | M | 625 | 0 | | | 4 |
| 12/2/2003 | M | 620 | 0 | | | 4 |
| 12/2/2003 | M | 610 | 1 | 1998 | M3 | 4 |
| 12/2/2003 | F | 555 | 0 | | | 4 |
| 12/2/2003 | M | 680 | 0 | | | 4 |
| 12/2/2003 | F | 550 | 0 | | | 4 |
| 12/2/2003 | M | 650 | 0 | | | 4 |
| 12/2/2003 | M | 605 | 0 | | | 4 |
| 12/02/200. | M | 670 | 1 | 1998 | L1 | 4 |
| Total Hatchery Fish | | | 170 (36%) | | | |
| Total Natural Production | | | 288 (61%) | | | |
| Unreadable | | | 14 (3%) | | | |

**Table A 5: Fish counts from the electronic fish counter by date and length for species passed above the Cedar River Landsburg Dam in 2004**

| Count | Passage Date and Time | Length Est. [cm] | Species |
|---|---|---|---|
| 1 | 12/20/2003 0:41 | 51 | Trout |
| 2 | 12/20/2003 10:43 | 57 | Trout |
| 3 | 12/21/2003 11:43 | 53 | Trout |
| 4 | 12/21/2003 12:05 | 52 | Trout |
| 5 | 12/21/2003 15:23 | 30 | Trout |
| 6 | 12/21/2003 22:49 | 61 | Trout |
| 7 | 12/24/2003 0:06 | 22 | Trout |
| 8 | 12/24/2003 12:38 | 60 | Trout |
| 9 | 12/25/2003 13:01 | 35 | Trout |
| 10 | 12/25/2003 16:02 | 27 | Trout |
| 11 | 12/31/2003 3:12 | 25 | Trout |
| 12 | 1/2/2004 16:09 | 27 | Trout |
| 13 | 1/2/2004 17:01 | 23 | Trout |
| 14 | 1/12/2004 15:55 | 28 | Trout |
| 15 | 1/15/2004 6:46 | 22 | Trout |
| 16 | 1/16/2004 10:59 | 21 | Trout |
| 17 | 1/18/2004 17:04 | 20 | Trout |
| 18 | 1/19/2004 12:43 | 20 | Trout |
| 19 | 1/23/2004 13:08 | 38 | Trout |
| 20 | 1/23/2004 17:00 | 28 | Trout |
| 21 | 1/27/2004 12:32 | 42 | Trout |
| 22 | 1/29/2004 2:55 | 35 | Trout |
| 23 | 1/29/2004 10:00 | 46 | Trout |
| 24 | 1/31/2004 13:20 | 51 | Trout |
| 25 | 2/1/2004 14:52 | 32 | Trout |
| 26 | 2/1/2004 14:55 | 57 | Trout |
| 27 | 2/4/2004 7:50 | 61 | Trout |
| 28 | 2/4/2004 12:55 | 37 | Trout |
| 29 | 2/7/2004 16:48 | 40 | Trout |
| 30 | 2/12/2004 14:30 | 26 | Trout |
| 31 | 2/12/2004 17:20 | 23 | Trout |
| 32 | 2/12/2004 19:01 | 53 | Trout |
| 33 | 2/13/2004 15:21 | 38 | Trout |
| 34 | 2/16/2004 17:31 | 25 | Trout |
| 35 | 2/17/2004 14:09 | 52 | Trout |
| 36 | 2/17/2004 20:33 | 43 | Trout |
| 37 | 2/17/2004 21:15 | 42 | Trout |
| 38 | 2/21/2004 5:38 | 38 | Trout |
| 39 | 2/26/2004 8:56 | 25 | Trout |
| 40 | 3/9/2004 16:10 | 46 | Trout |
| 41 | 3/9/2004 16:57 | 21 | Trout |
| 42 | 3/9/2004 17:14 | 26 | Trout |
| 43 | 3/9/2004 17:57 | 27 | Trout |
| 44 | 3/9/2004 18:31 | 24 | Trout |
| 45 | 3/9/2004 19:35 | 35 | Trout |
| 46 | 3/9/2004 19:51 | 25 | Trout |
| 47 | 3/9/2004 20:08 | 40 | Trout |
| 48 | 3/9/2004 23:33 | 25 | Trout |
| 49 | 3/10/2004 5:35 | 56 | Trout |
| 50 | 3/10/2004 10:20 | 27 | Trout |

| | | | |
|---|---|---|---|
| 51 | 3/10/2004 12:48 | 35 | Trout |
| 52 | 3/10/2004 14:58 | 27 | Trout |
| 53 | 3/10/2004 16:38 | 43 | Trout |
| 54 | 3/11/2004 15:12 | 56 | Trout |
| 55 | 3/11/2004 16:49 | 30 | Trout |
| 56 | 3/12/2004 7:52 | 33 | Trout |
| 57 | 3/12/2004 17:31 | 37 | Trout |
| 58 | 3/13/2004 15:29 | 51 | Trout |
| 59 | 3/13/2004 19:35 | 30 | Trout |
| 60 | 3/13/2004 23:32 | 40 | Trout |
| 61 | 3/14/2004 5:12 | 37 | Trout |
| 62 | 3/14/2004 6:29 | 55 | Trout |
| 63 | 3/14/2004 8:36 | 38 | Trout |
| 64 | 3/14/2004 8:36 | 37 | Trout |
| 65 | 3/14/2004 10:38 | 36 | Trout |
| 66 | 3/14/2004 14:56 | 40 | Trout |
| 67 | 3/14/2004 15:21 | 41 | Trout |
| 68 | 3/15/2004 1:42 | 25 | Trout |
| 69 | 3/15/2004 9:51 | 45 | Trout |
| 70 | 3/15/2004 17:32 | 42 | Trout |
| 71 | 3/16/2004 11:14 | 45 | Trout |
| 72 | 3/16/2004 13:23 | 22 | Trout |
| 73 | 3/16/2004 13:26 | 40 | Trout |
| 74 | 3/16/2004 14:28 | 32 | Trout |
| 75 | 3/16/2004 14:51 | 32 | Trout |
| 76 | 3/16/2004 15:45 | 20 | Trout |
| 77 | 3/16/2004 15:58 | 56 | Trout |
| 78 | 3/19/2004 17:21 | 20 | Trout |
| 79 | 3/20/2004 14:51 | 40 | Trout |
| 80 | 3/21/2004 16:42 | 41 | Trout |
| 81 | 3/22/2004 13:50 | 28 | Trout |
| 82 | 3/23/2004 10:56 | 50 | Trout |
| 83 | 3/23/2004 10:56 | 37 | Trout |
| 84 | 3/23/2004 15:05 | 21 | Trout |
| 85 | 3/23/2004 17:42 | 22 | Trout |
| 86 | 3/23/2004 20:28 | 39 | Trout |
| 87 | 3/24/2004 15:36 | 23 | Trout |
| 88 | 3/25/2004 1:37 | 25 | Trout |
| 89 | 3/26/2004 15:37 | 37 | Trout |
| 90 | 3/27/2004 7:46 | 22 | Trout |
| 91 | 3/27/2004 13:51 | 46 | Trout |
| 92 | 3/29/2004 13:13 | 21 | Trout |
| 93 | 3/29/2004 14:07 | 50 | Trout |
| 94 | 3/29/2004 14:16 | 20 | Trout |
| 95 | 3/29/2004 14:35 | 41 | Trout |
| 96 | 3/29/2004 16:08 | 48 | Trout |
| 97 | 3/29/2004 16:32 | 21 | Trout |
| 98 | 3/29/2004 18:24 | 27 | Trout |
| 99 | 3/30/2004 6:06 | 53 | Trout |
| 100 | 3/30/2004 13:10 | 31 | Trout |
| 101 | 3/30/2004 14:31 | 37 | Trout |
| 102 | 3/30/2004 14:59 | 26 | Trout |
| 103 | 3/31/2004 9:40 | 52 | Trout |
| 104 | 4/2/2004 17:16 | 46 | Trout |

| | | | |
|---|---|---|---|
| 105 | 4/2/2004 17:16 | 38 | Trout |
| 106 | 4/2/2004 20:34 | 23 | Trout |
| 107 | 4/3/2004 11:50 | 50 | Trout |
| 108 | 4/3/2004 12:06 | 37 | Trout |
| 109 | 4/3/2004 12:20 | 37 | Trout |
| 110 | 4/3/2004 13:37 | 50 | Trout |
| 111 | 4/3/2004 13:56 | 41 | Trout |
| 112 | 4/4/2004 12:03 | 38 | Trout |
| 113 | 4/4/2004 23:38 | 20 | Trout |
| 114 | 4/6/2004 2:50 | 53 | Trout |
| 115 | 4/6/2004 12:53 | 41 | Trout |
| 116 | 4/6/2004 18:20 | 20 | Trout |
| 117 | 4/7/2004 10:21 | 53 | Trout |
| 118 | 4/8/2004 11:37 | 53 | Trout |
| 119 | 4/8/2004 11:37 | 50 | Trout |
| 120 | 4/8/2004 11:51 | 36 | Trout |
| 121 | 4/8/2004 23:18 | 36 | Trout |
| 122 | 4/9/2004 16:56 | 71 | Trout |
| 123 | 4/9/2004 18:03 | 31 | Trout |
| 124 | 4/10/2004 4:25 | 38 | Trout |
| 125 | 4/10/2004 12:19 | 40 | Trout |
| 126 | 4/10/2004 12:50 | 30 | Trout |
| 127 | 4/10/2004 15:04 | 43 | Trout |
| 128 | 4/10/2004 16:11 | 26 | Trout |
| 129 | 4/11/2004 14:31 | 37 | Trout |
| 130 | 4/11/2004 16:23 | 20 | Trout |
| 131 | 4/11/2004 16:40 | 21 | Trout |
| 132 | 4/11/2004 17:50 | 21 | Trout |
| 133 | 4/11/2004 18:40 | 20 | Trout |
| 134 | 4/12/2004 12:41 | 40 | Trout |
| 135 | 4/12/2004 12:49 | 32 | Trout |
| 136 | 5/12/2004 15:33 | 33 | Trout |
| 137 | 5/12/2004 19:55 | 43 | Trout |
| 138 | 5/16/2004 10:25 | 37 | Trout |
| 139 | 5/16/2004 16:37 | 34 | Trout |
| 140 | 5/16/2004 21:15 | 25 | Trout |
| 141 | 5/17/2004 13:00 | 30 | Trout |
| 142 | 5/18/2004 1:05 | 42 | Trout |
| 143 | 5/18/2004 11:35 | 64 | Trout |
| 144 | 5/19/2004 10:09 | 24 | Trout |
| 145 | 5/19/2004 10:26 | 45 | Trout |
| 146 | 5/19/2004 20:10 | 28 | Trout |
| 147 | 5/20/2004 1:03 | 57 | Trout |
| 148 | 5/20/2004 13:11 | 30 | Trout |
| 149 | 5/20/2004 16:08 | 39 | Trout |
| 150 | 5/20/2004 18:10 | 54 | Trout |
| 151 | 5/21/2004 2:26 | 25 | Trout |
| 152 | 5/23/2004 7:16 | 28 | Trout |
| 153 | 5/24/2004 14:35 | 28 | Trout |
| 154 | 5/24/2004 17:38 | 75 | Presumptive Steelhead |
| 155 | 5/27/2004 17:22 | 39 | Trout |
| 156 | 5/28/2004 14:55 | 37 | Trout |
| 157 | 5/30/2004 12:29 | 28 | Trout |
| 158 | 5/30/2004 20:12 | 33 | Trout |

| | | | |
|---|---|---|---|
| 159 | 6/1/2004 11:55 | 45 | Trout |
| 160 | 6/1/2004 13:04 | 36 | Trout |
| 161 | 6/2/2004 2:13 | 42 | Trout |
| 162 | 6/2/2004 16:01 | 27 | Trout |
| 163 | 6/2/2004 18:31 | 25 | Trout |
| 164 | 6/2/2004 19:27 | 30 | Trout |
| 165 | 6/4/2004 14:22 | 28 | Trout |
| 166 | 6/4/2004 19:32 | 33 | Trout |
| 167 | 6/5/2004 11:05 | 28 | Trout |
| 168 | 6/5/2004 14:49 | 46 | Trout |
| 169 | 6/5/2004 20:43 | 25 | Trout |
| 170 | 6/5/2004 22:39 | 75 | Presumptive Steelhead |
| 171 | 6/6/2004 15:21 | 31 | Trout |
| 172 | 6/6/2004 20:08 | 25 | Trout |
| 173 | 6/6/2004 23:47 | 57 | Trout |
| 174 | 6/7/2004 13:06 | 60 | Trout |
| 175 | 6/7/2004 16:48 | 33 | Trout |
| 176 | 6/7/2004 20:44 | 27 | Trout |
| 177 | 6/8/2004 6:41 | 30 | Trout |
| 178 | 6/8/2004 17:39 | 34 | Trout |
| 179 | 6/8/2004 20:14 | 27 | Trout |
| 180 | 6/9/2004 0:39 | 51 | Trout |
| 181 | 6/9/2004 16:59 | 25 | Trout |
| 182 | 6/9/2004 19:57 | 27 | Trout |
| 183 | 6/10/2004 20:32 | 28 | Trout |
| 184 | 6/11/2004 15:50 | 48 | Trout |
| 185 | 6/11/2004 16:12 | 63 | Trout |
| 186 | 6/30/2004 19:44 | 30 | Trout |