Annual Report

Fish Passage Operations

at the Landsburg Dam Fish Passage Facilities

on the Cedar River from

July 2005 through June 2006

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Summary
This report summarizes the third season of fish passage operations from 7/1/05 through 6/30/06 at the 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 9/6/05 through 1/24/06 to prevent sockeye from passing above the Landsburg Dam and to aid in the collection of coho salmon for recolonization studies. It was operated in passive mode from 7/1/05 – 8/28/05 and from 1/25/06 - 6/30/06, providing unhindered passage above the dam for all native fish species. The facility was shut down for maintenance from 8/29/05 through 9/5/05 and from 5/15/06 through 5/19/06 (forebay cleaning). While in sorting mode a total of 1,250 adult sockeye entered the sorting facility, of which 359 were transported to the lower Cedar River and 865 were transported to the Cedar River Sockeye Hatchery for use as broodstock. A total of 69 adult Chinook salmon were passed above the dam from 9/20/05 to 11/4/05 and 170 adult coho were passed above the dam from 10/9/05 to 1/23/06. The sorting facility did experience some fish mortality, losing 1 female coho salmon (adipose fin present), 1 male Chinook salmon (adipose fin clipped) and 21 sockeye salmon with a majority of the losses attributed to jumping behavior.

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 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 2006 annual report focuses on the operation of the Landsburg Dam fish ladder and sorting facility from 7/1/05 through 6/30/06. Additional information including previous year's reports can be found at the Fish Passage Website at:
www.seattle.gov/util/About_SPU/Water_System/Habitat_Conservation_Plan--HCP/Landsburg_Mitigation.

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 schematic drawing of the fish ladder and sorting facility as well as a photograph of the sorting facility and Figure 2 shows the fish hopper on top of the fish transport truck.

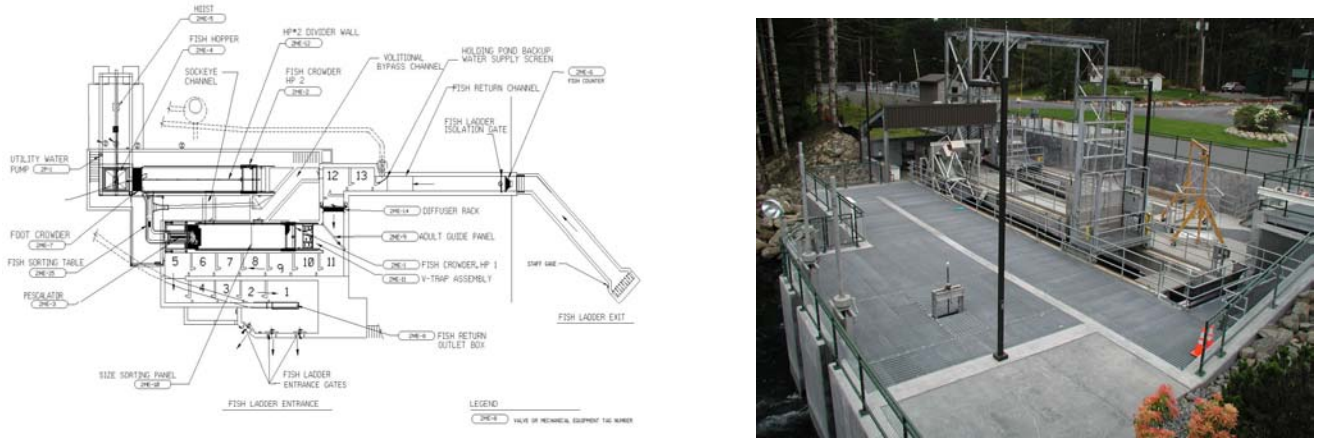

Figure 1: Layout of Landsburg Dam Fish Ladder and Sorting Facility

Methods and Procedures for 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 and trap. The crowder is 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 (Fig. 2) provides a workstation 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 is raised with a 5-ton hoist and placed on a water filled tank on the fish truck. As shown in Figure 2, the hopper is designed to provide a water-to-water transfer of sockeye from the hopper to the fish truck.

Figure 2: Sorting table operation and fish hopper on top of fish transport truck.

Passive Mode

When the fish ladder is operated in passive mode, fish are not allowed in the sorting facility and they move unhindered through the upper ladder and into river above the dam. The ladder was designed to be operated in this mode from late December through August (the time period when sockeye are generally absent from the river). In this mode, a Vaki River Watcher fish counter is used to monitor fish passage. 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 to count fish and calculate length and an underwater camera to aid in species identification, sex, and document the presence or absence of the adipose fin.

Results and Discussion

Sorting Mode

This was the second year SPU created a special assignment for Drainage and Wastewater (DWW) Collection Workers to work at fish passage facility. This opportunity was developed to encourage cross training within SPU and to allow the fish passage project to recruit staff that would return to the project on an annual basis, limiting the training of new recruits and developing an experienced technical staff. One trained DWW staff member from 2004 returned to fish passage operations in 2005. From 8/24/05 through 9/5/05 the new fish passage crew received preseason training in fish species identification, fish handling, facility equipment, fish hauling, and safety procedures. The ladder was configured in sorting mode on 9/6/05 and was staffed 7 days per week with hours of operation ranging from 7:00 AM to 5:00 PM. Fish were sorted daily to minimize delay of upstream migrating Chinook and coho. In late December the staffing level was reduced to the Landsburg Fish Passage Manager and a DWW Lead Collection Worker. The sorting operation continued into January 24th to get a better understanding of the 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 101 ft^3/s to 2,920 ft^3/s and the fish ladder operated as intended under these flow conditions (Fig. 3). The maximum flows (ft^3/s) recorded in sorting mode from 2003 and 2004 were 1,400 and 1,790 respectfully. Ambient water temperature at Landsburg ranged from 4.5 to 12 °C during this period (Fig 4).

Sockeye

From 9/15/05 to 12/20/05 1,250 sockeye entered the facility and 393 females and 845 males were collected and hauled to the river or the sockeye hatchery, less a few mortalities. The daily peak of the sockeye migration at Landsburg occurred on 10/1/05 with 90 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 21 (1.7%) sockeye with most mortalities (1%) attributed to fish jumping out of the holding ponds and the post-sort mortalities (.7%) attributed to holding over ripe fish.

Table 1: Count of sockeye sorted, transported and mortality at the Landsburg Fish Passage Facility in 2005

	Entered Facility	Presort Mortality	Number Sorted	Post-sort Mortality	Transported to Hatchery	Transported to River	Total Mortality	Total Transported
Female	398	5	393	1	389	1	6	390
Male	852	7	845	8	476	358	15	834
Total	**1250**	**12**	**1238**	**9**	**865**	**359**	**21**	**1224**

For the second year in a row, WDFW requested broodstock from the Landsburg fish ladder to spawn with fish held at the hatchery. This request was brought before the Anadromous Fish Committee (AFC) and members recommended that up to 1,000 sockeye or 20% of the broodstock for the hatchery could be collected from Landsburg. The fish passage operation provided 389 female and 476 male sockeye to the hatchery.

Chinook

Brood year 2005 marked the third 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). To support the study fish passage staff collected biological data (presence/absence of adipose fin, sex, fork length and condition) and a dorsal fin clip from all adult Chinook passed above Landsburg. A small portion of each fin clip was preserved in 100% ethanol for future genetic parentage analysis (Table A1). The fin clips were triangle shaped and approximately 15 mm wide at the base. The oversized clips provided staff with a mechanism to determine if the fish had already passed through the fish ladder. In 2005 no Chinook were found to have recycled through the ladder

Chinook salmon were passed upstream of the Landsburg Dam between 9/20/05 and 11/4/05. Table 2 shows that, of the 69 adult Chinook were passed upstream, a majority of the fish had adipose fins indicating that they were not of hatchery origin. This was a shift from last years Chinook count in which a majority of the fish were adipose clipped. There was 1 male Chinook mortality (adipose fin clipped) in the ladder on 9/29/05. The fish jumped onto the top of the v-trap entrance gate in pond one. In response, staff secured this area with additional jump protection.

Table 2: Summary of Chinook passed above the Landsburg Dam on the Cedar River, 2005

	Adipose Absent	Adipose Present	**Total**
Female	5	12	**17**
Male	24	28	**52**
Total	**29**	**40**	**69**

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) and tissue samples for future parentage DNA analysis. After observing a number of jack coho migrating above Landsburg, scales were removed from coho for age analysis. Up to six scales were removed from a total of 107 coho (male and female) from 10/25/05 to 1/1/06. The scales were aged by Washington Department of Fish and Wildlife (J. Sneva) and the results are shown below in Table 3, using the Gilbert-Rich designated system. Using this system the first number indicates the total age of the fish at maturity and the subscript indicates the when the fish went to sea. Most of the scale samples were not from jacks but represented a 3_2 age group that went to sea in the second year which is common for returning adult coho in the Lake Washington Basin. Of the sampled returning jacks, there was some variation of when the fish went to sea, with some going to sea in their first year (2_1) and a couple going to sea for a very short period in their second year(2_2) . Not surprising, there appears to be a significant size difference between jacks that went to sea for one year verses one summer.

Table 3: Summary of coho ages from samples collected at the Landsburg Dam on the Cedar River from 10/25/2005 – 1/1/2006

Gilbert-Rich designation	2_1	2_2	3_1	3_2	R*
Year – olds	2	2	3	3	?
Count by age group	5	2	1	81	18
Max. of fork length (mm)	520	380	570	790	720
Min. of fork length (mm)	400	330	570	450	490

* R designates the scales were regenerated and not readable.

Table 4 shows that a total of 170 coho were passed upstream and that all but six of the fish had adipose fins, indicating that they were almost all of natural origin. The facility had 1 natural origin female coho mortality on 1/11/06 (not included in total). This was the only coho observed recycling through the ladder this season. The fish was discovered in the bottom of the fish trap in the bypass channel. There were no apparent injuries and it was partially spawned out with approximately 1,000 eggs retained in the body cavity. Prior to this discovery the trap was checked on 1-9-06.

Table 4: Summary of Coho passed above the Landsburg Dam on the Cedar River, 2005/2006

	Adipose Absent	Adipose Present	**Total**
Female	2	64	**66**
Male	4	100	**104**
Total	**6**	**164**	**170**

Passive Mode

From 7/1/05 – 8/28/05 and from 1/25/06 - 6/30/06, the fish passage facility operated in passive mode providing fish unhindered passage above the Landsburg Dam. In passive mode, the Water Treatment Operators at Landsburg conducted routine inspections of the ladder facility to ensure there were no issues with debris. While in passive mode a 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 93 ft^3/s to 1,530 ft^3/s and the fish ladder operated as intended under these flow conditions (Fig. 4). Ambient water temperature at Landsburg ranged from 5.3 to 13.6 °C during this period (Fig 4).

Fish Passed Upriver in Passive Mode

A total of 234 fish were enumerated with the fish counter/camera in passive mode. Species identification was based on length estimates and photographic interpretation. Of that total, 210 were identified as trout. The daily peak of the trout migration occurred on April 15 (Fig. 4) and April was the monthly peak (Fig. 5). The hourly fish count peaked between 4:00 PM and 8:00 PM (Fig. 6). Figure 7 shows the size distribution (total length as estimated by electronic fish counter software) of trout moving above Landsburg with fairly large numbers of 20 cm to 34 cm trout moving upstream. The counts for trout are likely conservative because the counter/camera was not operational for part of the season. Of the remaining 24 fish observed, 12 of the 234 fish

passed upriver were determined to be either Chinook, coho, presumptive steelhead, or sockeye, and 12 were categorized as undecided (Table 5).

Table 5: Summary of species passed above the Landsburg Dam on the Cedar River while in passive mode in 2005/2006

Species	Count
Chinook	3
Coho	3
Presumptive Steelhead	5
Sockeye	1
Trout	210
Undecided	12
Total	**234**

In the time period covered by this report (7/1/05-6/30/06), the fish counter/camera system started to malfunction in late April and was turned off during forebay cleaning from 5/14/06 to 5/18/06. Unfortunately, the fish counter/camera system was not functional after forebay cleaning. The vendor determined one of the scanner plates had faulty light emitting diodes and integrated circuits which may have resulted from power surges (i.e., lightning or power spikes). The system was repaired and reinstalled along with power protection equipment when the fish passage facility was switched from sorting mode to passive mode on 1/25/06.

Fish Passage Facility Improvements Completed in 2005

Throughout the fall and winter of 2005, the fish passage staff made changes to the facility that improved worker safety, job efficiency, and fish handling.

- Lightweight hanging jump protection was used with great success.
- The fish ladder access along the dam was gated and locked.
- Fish jump protection on adult guide panel and trap entrance to pond one

Conclusions

For the 2005-2006 season (7/1/05 – 6/30/06), the fish ladder and sorting facility operated as intended and provided SPU and researchers with a unique opportunity to participate in long-term recolonization studies and collect biological data on Chinook and coho salmon and trout passed above the Landsburg. This was the first opportunity to observe jack coho that could have been produced after fish passage facilities were completed. DNA results are expected in 2007 that will verify parental origin. The fish passage operation also aided WDFW in broodstock collection efforts by providing male and female sockeye from the fish sorting facility. Fish mortality for all species at the fish ladder and sorting facility was reduced from the previous year, with sockeye mortalities at 1.7%, coho mortalities at 0.6%, and Chinook mortalities at 1.4%. The third year of operations was considered very successful in terms of fish movement into and through the ladder.

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 upstream of the Landsburg.
- Providing a safe working environment for staff
- Make improvements to facility to ensure long term reliability of equipment

Acknowledgements
Fish passage staff from the Drainage and Wastewater Division (in particular John McDowell) for operating the ladder and sorting facility. Bruce Bachen and Rand Little for supporting improvements to the fish ladder and sorting facility and for their constructive comments on this report.

List of Figures

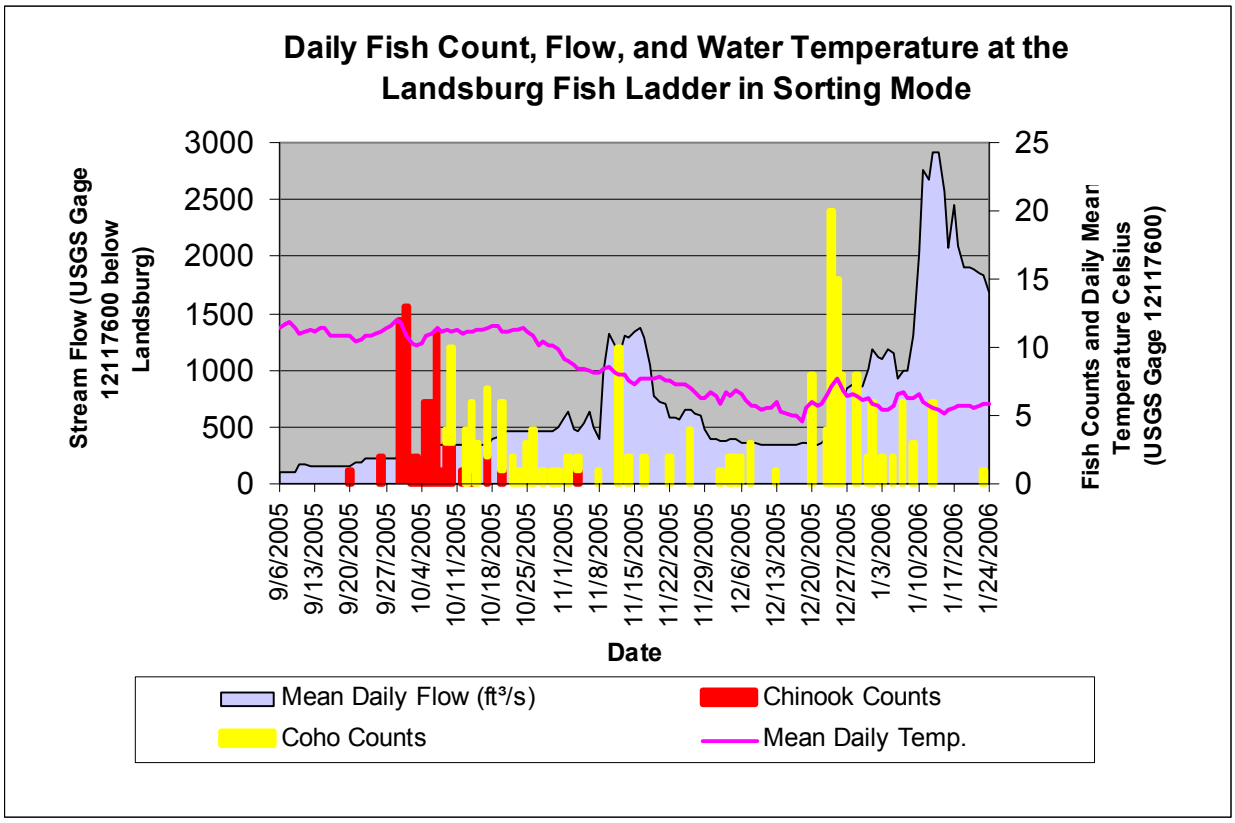

Figure 3: Daily fish count, stream flow, and temperature by week while in sorting mode at the Landsburg Fish Ladder, 2005/2006

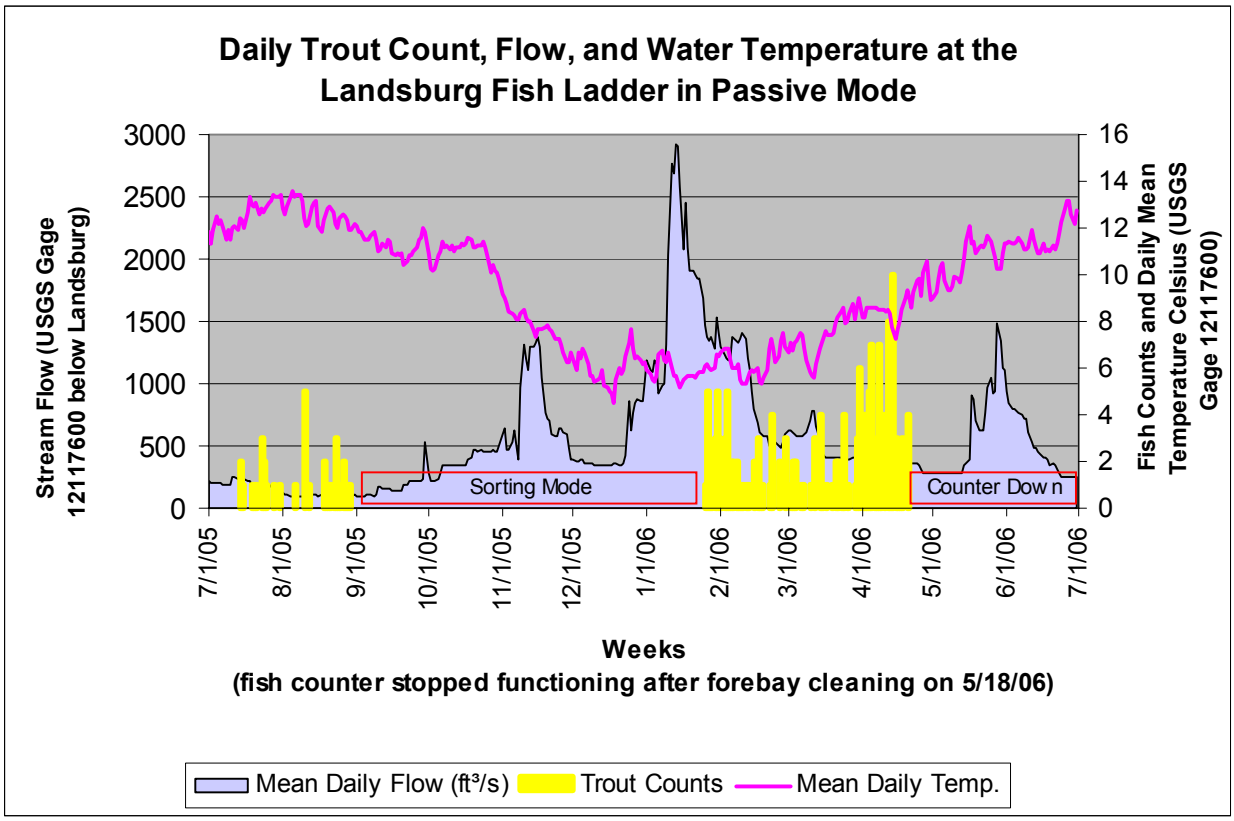

Figure 4: Daily trout count, stream flow, and temperature by week while in passive mode at the Landsburg Fish Ladder, 2005/2006

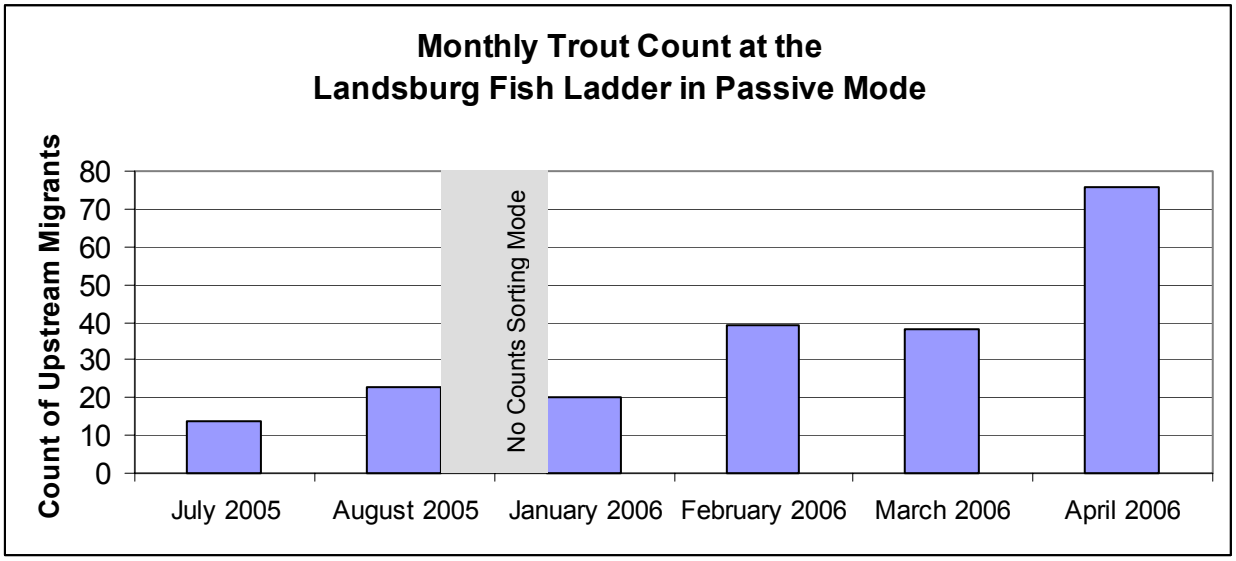

Figure 5: Monthly count of trout passed above the Cedar River Landsburg Dam (7/14/2005 – 4/20/2006)

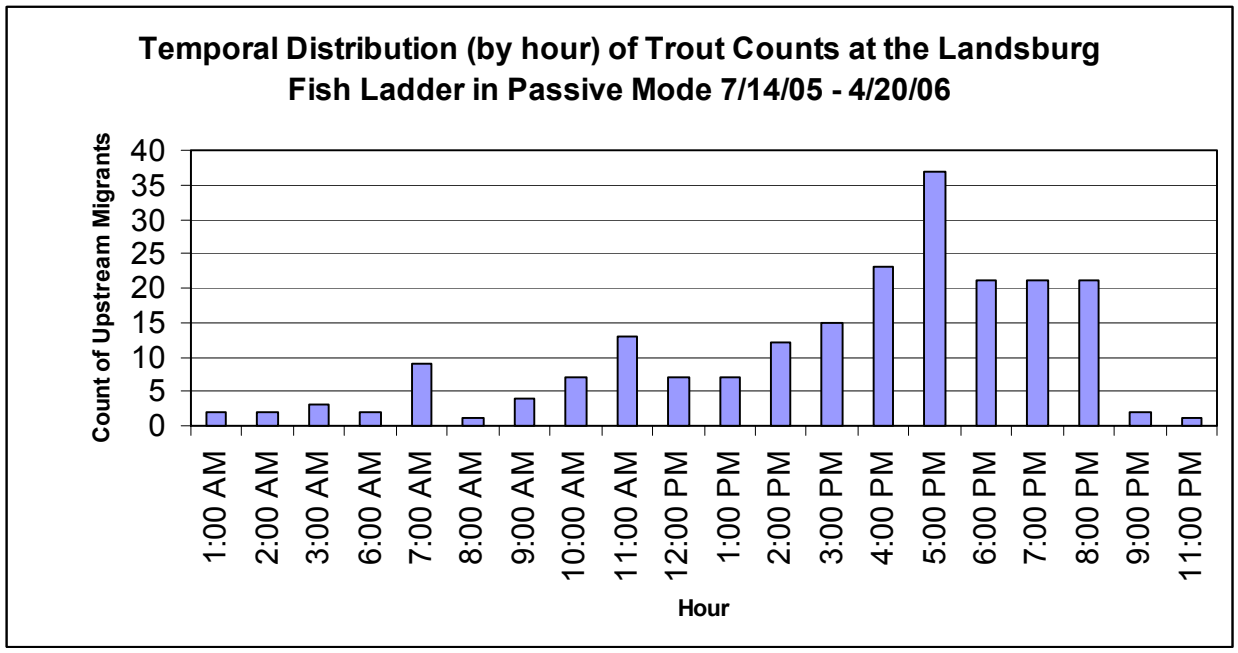

Figure 6: Temporal distribution (by hour) of trout passed above the Cedar River Landsburg Dam (7/14/2005 – 4/20/2006)

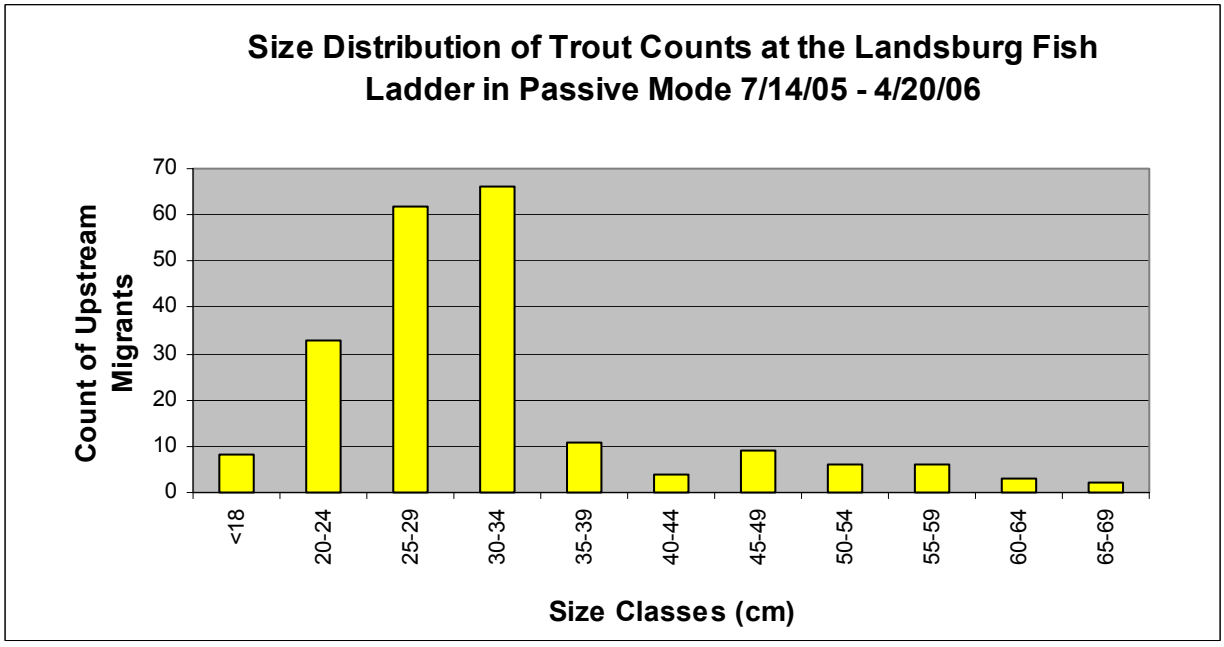

Figure 7: Size distribution of trout passed above the Cedar River Landsburg Dam (7/14/2005 – 4/20/2006)

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, 2005/2006

Sample No.	Sample Date	Species	Fork length (mm)	Sex	Adipose
2080	9/20/2005	Chinook	530	F	Present
2082	9/26/2005	Chinook	380	M	Present
2083	9/26/2005	Chinook	450	M	Present
2085	9/30/2005	Chinook	840	M	Present
2086	9/30/2005	Chinook	770	F	Present
2087	9/30/2005	Chinook	600	M	Absent
2088	9/30/2005	Chinook	820	F	Present
2089	9/30/2005	Chinook	760	M	Present
2090	9/30/2005	Chinook	820	F	Present
2091	9/30/2005	Chinook	780	M	Present
2092	9/30/2005	Chinook	750	M	Present
2093	9/30/2005	Chinook	880	M	Present
2094	9/30/2005	Chinook	820	F	Present
2095	9/30/2005	Chinook	630	F	Present
2096	9/30/2005	Chinook	690	M	Present
2097	10/1/2005	Chinook	820	M	Present
2098	10/1/2005	Chinook	780	M	Present
2099	10/1/2005	Chinook	840	M	Absent
2100	10/1/2005	Chinook	530	M	Present
2101	10/1/2005	Chinook	740	M	Present
2102	10/1/2005	Chinook	790	M	Absent
2103	10/1/2005	Chinook	790	M	Present
2104	10/1/2005	Chinook	790	M	Absent
2105	10/1/2005	Chinook	910	F	Absent
2106	10/1/2005	Chinook	720	M	Present
2107	10/1/2005	Chinook	700	M	Present
2108	10/1/2005	Chinook	770	M	Present
2109	10/1/2005	Chinook	680	M	Absent
2110	10/2/2005	Chinook	770	M	Present
2111	10/2/2005	Chinook	840	F	Present
2112	10/3/2005	Chinook	760	M	Absent
2113	10/3/2005	Chinook	770	M	Absent
2114	10/4/2005	Chinook	750	F	Present
2115	10/5/2005	Chinook	760	M	Present
2116	10/5/2005	Chinook	400	M	Present
2117	10/5/2005	Chinook	910	M	Present
2118	10/5/2005	Chinook	880	F	Absent
2119	10/5/2005	Chinook	800	M	Present
2120	10/5/2005	Chinook	930	M	Present
2121	10/6/2005	Chinook	460	M	Present
2122	10/6/2005	Chinook	730	F	Absent
2123	10/6/2005	Chinook	710	M	Absent
2124	10/6/2005	Chinook	900	F	Absent
2125	10/6/2005	Chinook	880	M	Absent
2126	10/6/2005	Chinook	730	M	Absent
2127	10/7/2005	Chinook	740	M	Present
2128	10/7/2005	Chinook	760	M	Present
2129	10/7/2005	Chinook	890	M	Present

Sample No.	Sample Date	Species	Fork length (mm)	Sex	Adipose
2130	10/7/2005	Chinook	860	M	Present
2131	10/7/2005	Chinook	840	M	Absent
2132	10/7/2005	Chinook	780	M	Absent
2133	10/7/2005	Chinook	780	M	Absent
2134	10/7/2005	Chinook	800	M	Absent
2135	10/7/2005	Chinook	840	M	Absent
2136	10/7/2005	Chinook	870	F	Present
2137	10/7/2005	Chinook	890	F	Present
2138	10/8/2005	Chinook	930	F	Present
2139	10/9/2005	Chinook	840	F	Present
2140	10/9/2005	Chinook	700	F	Absent
2141	10/9/2005	Chinook	890	M	Absent
2142	10/9/2005	Coho	390	M	Present
2143	10/10/2005	Chinook	810	M	Absent
2144	10/10/2005	Chinook	810	M	Absent
2145	10/10/2005	Coho	730	F	Absent
2146	10/10/2005	Coho	510	M	Present
2147	10/10/2005	Coho	410	M	Present
2148	10/10/2005	Coho	390	M	Present
2149	10/10/2005	Coho	400	M	Present
2150	10/10/2005	Coho	390	M	Present
2151	10/10/2005	Coho	350	M	Present
2152	10/10/2005	Chinook	730	M	Absent
2153	10/12/2005	Chinook	810	M	Absent
2154	10/13/2005	Coho	460	F	Present
2155	10/13/2005	Coho	520	F	Present
2156	10/13/2005	Coho	430	M	Present
2157	10/13/2005	Coho	400	M	Present
2158	10/14/2005	Chinook	780	M	Absent
2159	10/14/2005	Coho	430	M	Present
2160	10/14/2005	Coho	460	F	Present
2161	10/14/2005	Coho	390	M	Present
2162	10/14/2005	Coho	410	M	Present
2163	10/14/2005	Coho	520	M	Absent
2164	10/15/2005	Coho	480	F	Present
2165	10/15/2005	Coho	420	M	Present
2166	10/15/2005	Coho	540	F	Present
2167	10/17/2005	Coho	440	F	Present
2168	10/17/2005	Coho	380	M	Present
2169	10/17/2005	Chinook	790	M	Present
2170	10/17/2005	Chinook	880	M	Absent
2171	10/17/2005	Coho	450	M	Present
2172	10/17/2005	Coho	640	F	Present
2173	10/17/2005	Coho	340	M	Present
2174	10/20/2005	Chinook	600	M	Absent
2175	10/20/2005	Coho	365	M	Present
2176	10/20/2005	Coho	340	M	Present
2177	10/20/2005	Coho	450	F	Present
2178	10/20/2005	Coho	520	M	Present
2179	10/20/2005	Coho	550	F	Present
2180	10/22/2005	Coho	510	M	Absent

Sample No.	Sample Date	Species	Fork length (mm)	Sex	Adipose
2181	10/22/2005	Coho	530	M	Present
2182	10/23/2005	Coho	720	M	Absent
2183	10/24/2005	Coho	510	F	Present
2184	10/25/2005	Coho	485	M	Present
2185	10/25/2005	Coho	490	F	Present
2186	10/25/2005	Coho	465	M	Present
2187	10/26/2005	Coho	500	M	Absent
2188	10/26/2005	Coho	520	F	Present
2189	10/26/2005	Coho	640	M	Present
2190	10/26/2005	Coho	700	F	Present
2191	10/28/2005	Coho	520	M	Present
2192	10/30/2005	Coho	400	M	Present
2193	10/31/2005	Coho	710	M	Present
2194	11/2/2005	Coho	490	M	Present
2195	11/2/2005	Coho	710	M	Present
2196	11/4/2005	Coho	520	F	Present
2197	11/4/2005	Chinook	810	M	Absent
2198	11/8/2005	Coho	380	M	Present
2199	11/12/2005	Coho	550	M	Present
2200	11/12/2005	Coho	600	F	Present
2201	11/12/2005	Coho	660	M	Present
2202	11/12/2005	Coho	570	M	Present
2203	11/12/2005	Coho	630	F	Present
2204	11/12/2005	Coho	640	F	Present
2205	11/12/2005	Coho	590	M	Present
2206	11/12/2005	Coho	640	M	Present
2207	11/12/2005	Coho	790	F	Present
2208	11/12/2005	Coho	730	F	Present
2209	11/14/2005	Coho	600	M	Present
2210	11/14/2005	Coho	680	M	Present
2211	11/17/2005	Coho	600	M	Present
2212	11/17/2005	Coho	760	F	Present
2213	11/22/2005	Coho	700	F	Present
2214	11/22/2005	Coho	520	M	Present
2215	11/26/2005	Coho	590	F	Present
2216	11/26/2005	Coho	610	F	Present
2217	11/26/2005	Coho	550	M	Present
2218	11/26/2005	Coho	740	M	Present
2219	12/2/2005	Coho	600	F	Present
2220	12/4/2005	Coho	550	M	Present
2221	12/4/2005	Coho	730	F	Present
2222	12/5/2005	Coho	740	M	Present
2223	12/5/2005	Coho	750	F	Absent
2224	12/6/2005	Coho	610	M	Present
2225	12/6/2005	Coho	700	F	Present
2226	12/8/2005	Coho	490	M	Present
2227	12/8/2005	Coho	590	M	Present
2228	12/8/2005	Coho	700	M	Present
2229	12/13/2005	Coho	530	M	Present
2230	12/20/2005	Coho	630	M	Present
2231	12/20/2005	Coho	570	M	Present

Sample No.	Sample Date	Species	Fork length (mm)	Sex	Adipose
2232	12/20/2005	Coho	620	F	Present
2233	12/20/2005	Coho	600	M	Present
2234	12/20/2005	Coho	730	M	Present
2235	12/20/2005	Coho	520	F	Present
2236	12/20/2005	Coho	590	F	Present
2237	12/20/2005	Coho	640	M	Present
2238	12/23/2005	Coho	630	M	Present
2239	12/23/2005	Coho	650	M	Present
2240	12/23/2005	Coho	700	M	Present
2241	12/23/2005	Coho	600	M	Present
2242	12/24/2005	Coho	530	M	Present
2243	12/24/2005	Coho	620	F	Present
2244	12/24/2005	Coho	710	M	Present
2245	12/24/2005	Coho	700	M	Present
2246	12/24/2005	Coho	630	M	Present
2247	12/24/2005	Coho	560	M	Present
2248	12/24/2005	Coho	740	M	Present
2249	12/24/2005	Coho	550	M	Present
2250	12/24/2005	Coho	630	M	Present
2251	12/24/2005	Coho	720	M	Present
2252	12/24/2005	Coho	560	F	Present
2253	12/24/2005	Coho	700	M	Present
2254	12/24/2005	Coho	680	M	Present
2255	12/24/2005	Coho	330	M	Present
2256	12/24/2005	Coho	630	M	Present
2257	12/24/2005	Coho	680	M	Present
2258	12/24/2005	Coho	570	M	Present
2259	12/24/2005	Coho	640	M	Present
2260	12/24/2005	Coho	630	F	Present
2261	12/24/2005	Coho	710	M	Present
2262	12/25/2005	Coho	600	M	Present
2263	12/25/2005	Coho	700	F	Present
2264	12/25/2005	Coho	550	M	Present
2265	12/25/2005	Coho	550	F	Present
2266	12/25/2005	Coho	750	M	Present
2267	12/25/2005	Coho	530	M	Present
2268	12/25/2005	Coho	610	F	Present
2269	12/25/2005	Coho	680	M	Present
2270	12/25/2005	Coho	640	M	Present
2271	12/25/2005	Coho	580	F	Present
2272	12/25/2005	Coho	570	F	Present
2273	12/25/2005	Coho	600	F	Present
2274	12/25/2005	Coho	580	F	Present
2275	12/25/2005	Coho	570	F	Present
2276	12/25/2005	Coho	580	F	Present
2277	12/26/2005	Coho	540	F	Present
2278	12/26/2005	Coho	680	F	Present
2279	12/26/2005	Coho	760	M	Present
2280	12/26/2005	Coho	710	M	Present
2281	12/26/2005	Coho	630	M	Present
2282	12/26/2005	Coho	650	M	Present

Sample No.	Sample Date	Species	Fork length (mm)	Sex	Adipose
2283	12/26/2005	Coho	620	F	Present
2284	12/26/2005	Coho	700	F	Present
2285	12/29/2005	Coho	670	M	Present
2286	12/29/2005	Coho	610	F	Present
2287	12/29/2005	Coho	640	M	Present
2288	12/29/2005	Coho	720	F	Present
2289	12/29/2005	Coho	720	F	Present
2290	12/29/2005	Coho	560	M	Present
2291	12/29/2005	Coho	530	F	Present
2292	12/29/2005	Coho	660	M	Present
2293	12/31/2005	Coho	700	F	Present
2294	12/31/2005	Coho	710	M	Present
2295	1/1/2006	Coho	550	F	Present
2296	1/1/2006	Coho	450	F	Present
2297	1/1/2006	Coho	550	F	Present
2298	1/1/2006	Coho	650	M	Present
2299	1/1/2006	Coho	530	F	Present
2300	1/1/2006	Coho	640	M	Present
2301	1/3/2006	Coho	610	F	Present
2302	1/3/2006	Coho	600	F	Present
2303	1/5/2006	Coho	550	F	Present
2304	1/5/2006	Coho	660	F	Present
2305	1/7/2006	Coho	470	M	Present
2306	1/7/2006	Coho	530	M	Present
2307	1/7/2006	Coho	510	M	Present
2308	1/7/2006	Coho	620	F	Present
2309	1/7/2006	Coho	575	F	Present
2310	1/7/2006	Coho	590	F	Present
2311	1/9/2006	Coho	600	F	Present
2312	1/9/2006	Coho	690	M	Present
2313	1/9/2006	Coho	700	M	Present
2314	1/11/2006	Coho (mort.)*	610	F	Present
2315	1/13/2006	Coho	630	M	Present
2316	1/13/2006	Coho	670	M	Present
2317	1/13/2006	Coho	650	F	Present
2318	1/13/2006	Coho	650	F	Present
2319	1/13/2006	Coho	660	M	Present
2320	1/13/2006	Coho	740	M	Present
2321	1/23/2006	Coho	600	M	Present

* Data was collected for genetic parentage analysis.

Table A 2: Sockeye counts from the Cedar River Landsburg Dam Fish Passage Facility in 2005

Date	Sockeye Female Presort Mortality	Sockeye Male Presort Mortality	Sockeye Female Sorted	Sockeye Male Sorted	Sockeye Female Post sort Mortality	Sockeye Male Post sort Mortality	Sockeye Female to Hatchery	Sockeye Male to Hatchery	Sockeye Female to RM 13	Sockeye Male to RM 13	Sockeye Female to Below Landsburg	Sockeye Male to Below Landsburg
9/15/2005	0	0	19	26	0	0	19	26	0	0	0	0
9/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/17/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/18/2005	0	1	24	27	0	0	0	0	0	0	0	0
9/19/2005	1	0	13	15	0	0	37	42	0	0	0	0
9/20/2005	0	1	2	3	0	0	0	0	0	0	0	0
9/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/22/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/25/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/27/2005	0	0	22	45	0	0	22	45	0	0	0	0
9/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
9/29/2005	0	0	13	37	0	0	0	0	0	0	0	0
9/30/2005	1	0	6	11	0	0	0	0	0	0	0	0
10/1/2005	0	1	37	53	0	0	0	0	0	101	0	0
10/2/2005	0	0	18	28	0	0	74	0	0	0	0	0
10/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
10/4/2005	0	0	3	8	0	1	0	0	0	0	0	0
10/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
10/6/2005	0	0	4	20	0	0	0	0	0	0	0	0
10/7/2005	3	1	11	23	0	0	0	0	0	76	0	0
10/8/2005	0	1	0	0	0	0	0	0	0	0	0	0
10/9/2005	0	0	16	36	0	0	0	0	0	0	0	0
10/10/2005	0	0	4	13	0	0	34	0	0	0	0	0
10/11/2005	0	0	0	0	0	0	0	0	0	51	0	0
10/12/2005	0	0	4	3	0	0	0	0	0	0	0	0
10/13/2005	0	1	13	24	0	0	0	0	0	0	0	0
10/14/2005	0	0	7	26	0	0	0	0	0	0	0	0
10/15/2005	0	0	0	12	0	0	0	0	0	0	0	0
10/16/2005	0	0	0	0	0	0	28	0	0	0	0	0
10/17/2005	0	0	5	19	0	0	0	0	0	81	0	0
10/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
10/19/2005	0	0	0	0	0	0	0	0	0	0	0	0
10/20/2005	0	0	13	33	0	0	0	0	0	0	0	0
10/21/2005	0	0	0	0	0	0	18	36	0	0	0	0
10/22/2005	0	0	9	18	0	0	0	0	0	0	0	0
10/23/2005	0	0	1	8	0	0	9	0	0	0	0	0
10/24/2005	0	0	6	17	0	0	0	0	0	43	0	0
10/25/2005	0	0	0	0	0	0	0	0	0	0	0	0
10/26/2005	0	0	8	33	0	0	15	33	0	0	0	0
10/27/2005	0	0	16	25	0	0	0	0	0	0	0	0
10/28/2005	0	0	5	8	0	0	0	0	0	0	0	0
10/29/2005	0	0	12	18	0	0	0	0	0	0	0	0
10/30/2005	0	0	8	14	0	0	41	0	0	0	0	0
10/31/2005	0	0	6	9	0	0	0	73	0	0	0	0
11/1/2005	0	0	0	0	0	0	0	0	0	0	0	0

11/2/2005	0	0	13	30	0	1	0	0	0	0	0	0
11/3/2005	0	0	0	0	0	0	19	30	0	0	0	0
11/4/2005	0	0	8	19	0	0	0	0	0	0	0	0
11/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/7/2005	0	0	1	12	0	1	9	30	0	0	0	0
11/8/2005	0	0	3	18	0	0	0	0	0	0	0	0
11/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/10/2005	0	0	18	53	0	0	0	0	0	0	0	0
11/11/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/12/2005	0	0	1	8	0	0	0	0	0	0	0	0
11/13/2005	0	0	1	4	0	2	23	81	0	0	0	0
11/14/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/16/2005	0	0	4	8	0	0	0	0	0	0	0	0
11/17/2005	0	0	3	8	0	0	0	0	0	0	0	0
11/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/19/2005	0	0	1	11	0	0	0	0	0	0	0	0
11/20/2005	0	0	4	11	0	0	0	0	0	0	0	0
11/21/2005	0	1	14	0	0	0	26	38	0	0	0	0
11/22/2005	0	0	3	13	0	0	0	0	0	0	0	0
11/23/2005	0	0	1	9	0	0	0	0	0	0	0	0
11/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/25/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/26/2005	0	0	6	9	0	0	0	0	0	0	0	0
11/27/2005	0	0	0	0	0	0	10	0	0	0	0	0
11/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/29/2005	0	0	0	0	0	0	0	0	0	0	0	0
11/30/2005	0	0	0	3	0	3	0	0	0	0	0	0
12/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/2/2005	0	0	1	3	0	0	0	0	0	0	0	0
12/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/4/2005	0	0	4	8	0	0	5	42	0	0	0	0
12/5/2005	0	0	2	4	0	0	0	0	0	0	0	0
12/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/8/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/11/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/12/2005	0	0	0	0	1	0	0	0	0	0	0	0
12/13/2005	0	0	0	1	0	0	0	0	0	0	0	0
12/14/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/17/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/19/2005	0	0	0	0	0	0	0	0	0	0	0	0
12/20/2005	0	0	0	1	0	0	0	0	0	0	1	6
Subtotal	**5**	**7**	**393**	**845**	**1**	**8**	**389**	**476**	**0**	**352**	**1**	**6**
Total	**12**		**1238**		**9**		**865**		**352**		**7**	

Table A 3: Fish counts from the electronic fish counter by date, hour, and length for species passed above the Cedar River Landsburg Dam in 2005/2006

Count	Date	Hour	Species	Length (cm)
1	7/14/05	2 AM	Chinook	99
2	7/14/05	6 PM	Trout	31
3	7/14/05	8 PM	Trout	24
4	7/15/05	10 AM	Trout	24
5	7/19/05	8 PM	Trout	33
6	7/20/05	7 PM	Trout	30
7	7/21/05	8 PM	Trout	31
8	7/21/05	11 PM	Undecided	51
9	7/23/05	2 AM	Undecided	58
10	7/23/05	11 AM	Trout	12
11	7/23/05	11 AM	Trout	18
12	7/23/05	7 PM	Trout	33
13	7/24/05	2 PM	Chinook	70
14	7/24/05	8 PM	Trout	27
15	7/24/05	8 PM	Trout	30
16	7/25/05	3 PM	Trout	33
17	7/28/05	8 PM	Trout	30
18	7/28/05	11 PM	Undecided	60
19	7/30/05	7 PM	Trout	27
20	7/31/05	5 AM	Sockeye	64
21	7/31/05	10 PM	Undecided	66
22	8/6/05	7 PM	Trout	22
23	8/10/05	7 AM	Trout	12
24	8/10/05	7 AM	Trout	12
25	8/10/05	7 AM	Trout	12
26	8/10/05	7 AM	Trout	12
27	8/10/05	7 AM	Trout	12
28	8/12/05	7 PM	Trout	31
29	8/18/05	3 AM	Trout	30
30	8/18/05	8 PM	Trout	30
31	8/19/05	8 PM	Trout	27
32	8/20/05	8 PM	Trout	30
33	8/21/05	8 PM	Trout	30
34	8/22/05	5 AM	Undecided	72
35	8/22/05	7 PM	Trout	27
36	8/23/05	6 PM	Trout	24
37	8/23/05	7 PM	Trout	30
38	8/23/05	8 PM	Trout	25
39	8/24/05	4 AM	Undecided	69
40	8/24/05	8 PM	Trout	25
41	8/25/05	8 PM	Trout	30
42	8/26/05	3 AM	Chinook	72
43	8/26/05	7 PM	Trout	21
44	8/26/05	8 PM	Trout	30
45	8/26/05	9 PM	Undecided	57
46	8/27/05	8 PM	Trout	30
47	8/28/05	7 PM	Trout	28
48	8/29/05	2 AM	Trout	18

Count	Date	Hour	Species	Length (cm)
49	1/25/06	4 PM	Coho	54
50	1/25/06	5 PM	Trout	39
51	1/26/06	11 AM	Trout	22
52	1/26/06	11 AM	Trout	27
53	1/26/06	11 AM	Trout	33
54	1/26/06	12 PM	Trout	31
55	1/26/06	2 PM	Coho	76
56	1/26/06	5 PM	Trout	34
57	1/27/06	2 PM	Trout	57
58	1/27/06	3 PM	Trout	28
59	1/28/06	6 PM	Trout	28
60	1/29/06	11 AM	Trout	27
61	1/29/06	4 PM	Undecided	61
62	1/29/06	4 PM	Trout	30
63	1/29/06	6 PM	Trout	30
64	1/30/06	6 AM	Trout	51
65	1/30/06	8 AM	Trout	33
66	1/30/06	9 AM	Trout	37
67	1/30/06	9 AM	Trout	43
68	1/30/06	11 AM	Trout	46
69	1/30/06	11 AM	Undecided	72
70	1/30/06	2 PM	Undecided	72
71	1/30/06	7 PM	Undecided	70
72	1/31/06	7 AM	Trout	24
73	1/31/06	1 PM	Trout	24
74	1/31/06	3 PM	Trout	45
75	1/31/06	7 PM	Coho	87
76	2/1/06	5 PM	Trout	21
77	2/1/06	6 PM	Trout	24
78	2/2/06	11 AM	Trout	33
79	2/2/06	4 PM	Trout	34
80	2/2/06	5 PM	Trout	28
81	2/3/06	10 AM	Trout	40
82	2/3/06	4 PM	Trout	27
83	2/3/06	5 PM	Trout	28
84	2/3/06	9 PM	Trout	46
85	2/3/06	11 PM	Trout	42
86	2/4/06	4 PM	Trout	24
87	2/5/06	2 AM	Undecided	64
88	2/5/06	5 PM	Trout	28
89	2/5/06	5 PM	Trout	24
90	2/6/06	5 PM	Trout	27
91	2/6/06	5 PM	Trout	30
92	2/7/06	5 PM	Trout	22
93	2/7/06	5 PM	Trout	28
94	2/8/06	5 PM	Trout	30
95	2/9/06	5 PM	Trout	30
96	2/10/06	5 PM	Trout	30
97	2/11/06	5 PM	Trout	28
98	2/12/06	12 PM	Trout	36

Count	Date	Hour	Species	Length (cm)
99	2/15/06	5 PM	Trout	24
100	2/15/06	5 PM	Trout	39
101	2/16/06	5 PM	Trout	24
102	2/16/06	7 PM	Trout	30
103	2/16/06	9 PM	Trout	33
104	2/17/06	5 PM	Trout	25
105	2/18/06	5 PM	Trout	22
106	2/21/06	3 PM	Trout	67
107	2/22/06	3 PM	Trout	28
108	2/22/06	4 PM	Trout	24
109	2/22/06	5 PM	Trout	27
110	2/22/06	5 PM	Trout	25
111	2/25/06	5 PM	Trout	24
112	2/25/06	5 PM	Trout	27
113	2/28/06	11 AM	Trout	46
114	2/28/06	5 PM	Trout	24
115	2/28/06	6 PM	Trout	25
116	3/2/06	5 PM	Trout	31
117	3/3/06	2 AM	Trout	30
118	3/3/06	5 PM	Trout	27
119	3/4/06	5 PM	Trout	25
120	3/4/06	6 PM	Trout	30
121	3/6/06	9 AM	Trout	49
122	3/7/06	10 AM	Trout	57
123	3/10/06	5 PM	Trout	25
124	3/12/06	4 PM	Trout	31
125	3/12/06	5 PM	Trout	39
126	3/12/06	6 PM	Trout	25
127	3/14/06	10 AM	Trout	25
128	3/14/06	12 PM	Trout	25
129	3/14/06	5 PM	Trout	24
130	3/14/06	5 PM	Trout	24
131	3/15/06	6 PM	Trout	30
132	3/17/06	6 PM	Trout	27
133	3/19/06	6 PM	Trout	37
134	3/21/06	11 AM	Trout	60
135	3/21/06	6 PM	Trout	28
136	3/22/06	1 AM	Trout	31
137	3/22/06	6 PM	Trout	22
138	3/23/06	3 AM	Trout	22
139	3/24/06	6 AM	Trout	25
140	3/24/06	7 AM	Trout	52
141	3/24/06	1 PM	Trout	31
142	3/24/06	1 PM	Trout	28
143	3/25/06	4 PM	Presumptive Steelhead	75
144	3/26/06	7 AM	Trout	30
145	3/29/06	6 PM	Trout	27
146	3/30/06	11 AM	Trout	52
147	3/30/06	2 PM	Trout	55
148	3/30/06	4 PM	Trout	60

Count	Date	Hour	Species	Length (cm)
149	3/31/06	10 AM	Trout	63
150	3/31/06	11 AM	Trout	24
151	3/31/06	12 PM	Trout	33
152	3/31/06	12 PM	Trout	27
153	3/31/06	2 PM	Trout	24
154	3/31/06	3 PM	Trout	25
155	4/1/06	12 AM	Presumptive Steelhead	79
156	4/1/06	1 AM	Trout	49
157	4/1/06	12 PM	Trout	58
158	4/1/06	2 PM	Trout	28
159	4/1/06	6 PM	Trout	25
160	4/2/06	10 AM	Trout	25
161	4/2/06	11 AM	Trout	51
162	4/2/06	6 PM	Presumptive Steelhead	73
163	4/2/06	6 PM	Presumptive Steelhead	78
164	4/2/06	6 PM	Presumptive Steelhead	81
165	4/2/06	7 PM	Trout	39
166	4/2/06	7 PM	Trout	36
167	4/3/06	1 PM	Trout	30
168	4/3/06	4 PM	Trout	28
169	4/4/06	10 AM	Trout	42
170	4/4/06	2 PM	Trout	28
171	4/4/06	3 PM	Trout	33
172	4/4/06	4 PM	Trout	28
173	4/4/06	8 PM	Trout	66
174	4/5/06	2 PM	Trout	30
175	4/5/06	2 PM	Trout	27
176	4/5/06	2 PM	Trout	31
177	4/5/06	3 PM	Trout	46
178	4/5/06	4 PM	Trout	46
179	4/5/06	7 PM	Trout	24
180	4/5/06	7 PM	Trout	31
181	4/6/06	12 PM	Trout	31
182	4/6/06	5 PM	Trout	58
183	4/7/06	4 PM	Trout	28
184	4/7/06	5 PM	Trout	28
185	4/7/06	7 PM	Trout	39
186	4/8/06	1 PM	Trout	31
187	4/8/06	4 PM	Trout	27
188	4/8/06	4 PM	Trout	28
189	4/8/06	5 PM	Trout	28
190	4/8/06	7 PM	Trout	31
191	4/8/06	7 PM	Trout	28
192	4/8/06	7 PM	Trout	31
193	4/9/06	9 AM	Trout	27
194	4/9/06	4 PM	Trout	52
195	4/9/06	4 PM	Trout	33
196	4/9/06	7 PM	Trout	25
197	4/10/06	2 PM	Trout	48
198	4/10/06	2 PM	Trout	54

Count	Date	Hour	Species	Length (cm)
199	4/10/06	4 PM	Trout	24
200	4/10/06	6 PM	Trout	27
201	4/12/06	2 PM	Trout	24
202	4/12/06	4 PM	Trout	33
203	4/12/06	4 PM	Trout	22
204	4/12/06	4 PM	Trout	28
205	4/12/06	5 PM	Trout	33
206	4/12/06	5 PM	Trout	21
207	4/12/06	6 PM	Trout	24
208	4/12/06	8 PM	Trout	28
209	4/13/06	4 PM	Trout	30
210	4/13/06	6 PM	Trout	22
211	4/14/06	3 AM	Trout	33
212	4/14/06	7 AM	Trout	55
213	4/14/06	1 PM	Trout	31
214	4/14/06	1 PM	Trout	31
215	4/14/06	2 PM	Trout	33
216	4/14/06	3 PM	Trout	31
217	4/14/06	3 PM	Trout	28
218	4/14/06	4 PM	Trout	33
219	4/14/06	4 PM	Trout	31
220	4/14/06	4 PM	Trout	36
221	4/15/06	6 PM	Trout	33
222	4/15/06	6 PM	Trout	25
223	4/15/06	8 PM	Trout	36
224	4/16/06	3 PM	Trout	25
225	4/16/06	8 PM	Trout	34
226	4/17/06	3 PM	Trout	33
227	4/17/06	8 PM	Trout	34
228	4/18/06	7 PM	Trout	24
229	4/18/06	7 PM	Trout	25
230	4/18/06	8 PM	Trout	27
231	4/20/06	3 PM	Trout	28
232	4/20/06	3 PM	Trout	30
233	4/20/06	3 PM	Trout	28
234	4/20/06	6 PM	Trout	31