Toboggan Creek Coho Smolt Enumeration 1999

Prepared by

SKR Consultants Ltd.
Smithers, B.C.

for

Department of Fisheries and Oceans
Pacific Biological Station
Nanaimo, B.C.

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Executive Summary

Juvenile coho were sampled in Toboggan Creek for the fifth consecutive year. A wolf type weir constructed upstream of the Toboggan Creek hatchery was used for smolt enumeration in the spring of 1999. A rotary screw trap was used for smolt enumeration in the spring of 1998, and a fyke trap was used for coho smolt enumeration in 1995, 1996 and 1997. The wolf type weir was sampled 24 hours a day, except from May 23 to 25 and June 12 to 19 when elevated water levels required the removal of the fence panels. Data on discharge, water temperature, ambient temperature, weather conditions and trap performance were collected throughout the study.

Fish species captured during the study period include coho (*Oncorhynchus kisutch*), Dolly Varden (*Salvelinus malma*), rainbow trout/steelhead (*O. mykiss*), cutthroat trout (*O. clarki*), mountain whitefish (*Prosopium williamsoni*), longnose suckers (*Catastomus catastomus*) and lamprey (*Lampetra sp.*). A total of 7215 wild coho, 202 rainbow trout/steelhead, 52 Dolly Varden, 26 cutthroat trout, seven mountain whitefish, five longnose suckers and 108 lampreys were captured.

Trap performance was generally good, and it is felt that catches were a direct indicator of migration rates. Mark-recapture experiments resulted in a recapture rate of 12-21%. Adjusted Petersen estimates were determined for the three different mark-recapture experiments conducted. It is estimated that between 35,963.7 and 55,851.8 smolts were present upstream of the weir location in the spring of 1999. The peak migration of coho smolts appeared to occur between June 8 and June 19, but the exact timing of the peak could not be determined as the fence panels were removed due to high flow periods during the peak migration period.

Wild coho smolts captured at the Toboggan Creek weir were coded wire tagged and adipose fin clipped prior to their release. Tag retention ranged between 66.7 and 100 %. The lower percent tag retention was encountered earlier in the study due to difficulties with the head moulds used for fish ranging between 110 and 125 mm in fork length. Head molds adjustments yielded improved tag retention as the study progressed. Adjusting for 24 hour tag retention, the number of tagged coho smolts is estimated to be 6589 (1505 smolts between 60 and 100 mm fork length, and 5084 smolts greater than 100 mm fork length).

All data collected during the 1999 sampling period is located in Appendices 1 and 2. A general summary of the data and recommendations for the continuation of this sampling program, trap modifications, and trap operation on an annual basis are given.

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Acknowledgments

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1.0 Introduction

Toboggan Creek is a glacial tributary to the Bulkley River, within the Skeena watershed. Toboggan Creek has good spawning habitat, and its low gradient side channels and Toboggan Lake appear to provide a substantial amount of suitable rearing habitat for juvenile coho salmon (*Oncorhynchus kisutch*). Adult coho returns to Toboggan Creek have ranged from 394 to 4500 in the past ten years (O'Neill pers. comm.). In addition to coho, steelhead (*O. mykiss*), cutthroat trout (*O. clarki*), rocky mountain whitefish (*Prosopium williamsoni)*, Dolly Varden (*Salvelinus malma*), occasionally chinook (*Oncorhynchus tsatwytscha*), lamprey (*Lampetra sp.*) and sculpin (*Cottus sp.*) are known to utilize the system (SISS, FISS, Donas and Saimoto 1999).

Toboggan Creek is a relatively unique sub-drainage of the Skeena Watershed in that it has a hatchery facility which has augmented the Toboggan Creek coho stock since 1988 (1986 brood year). Smolts released from the hatchery are marked with coded wire tags and adipose fin clips. An adult counting fence, located approximately 2.5 km upstream of the confluence of the creek with the Bulkley River (Figure 1), has served for the detailed enumeration of adult coho since 1989 and adult steelhead since 1993 (O'Neill pers. comm.). The adult fence is maintained and managed by the Toboggan Creek hatchery staff. Due to the availability of reliable adult escapement data, and the presence of a known number of marked coho smolts in the system, Toboggan Creek lends itself to studies in freshwater survival, age distribution at smoltification, migration timing and recruitment of juvenile coho salmon.

The primary focus of the "Toboggan Creek Smolt Project" is to collect information which can be used for an estimation of the number of wild coho smolts leaving Toboggan Creek. The 1999 juvenile index work will be complimented by adult coho studies conducted in the fall of 1995, 1996, 1997 and 1998. The fall studies provided escapement estimates of 1762, 1166, 376 and 1970 adult coho returns upstream of the fence, respectively (O'Neill pers. comm.). In addition, future adult escapement estimates conducted in 1999, 2000 and 2001 will provide valuable information on smolt to adult survival.

This is the fifth consecutive year of the coho smolt enumeration project in Toboggan Creek. The project was initiated in the spring of 1995 (Saimoto 1995), and repeated in the spring of 1996 (SKR 1996) and 1997 (SKR 1997). In 1998, sampling techniques were altered to further reduce stress and mortalities on coho salmon in Toboggan Creek by using a rotary screw trap (SKR 1998). In 1999, the trapping location and methodology was changed to obtain a better estimate of the wild production of coho in the system, and to tag a large proportion of wild coho using coded wire tags. This report summarizes data collected in the 1999 field season. Data will be utilized by the Department of Fisheries to conduct abundance estimates, and to assess smolt to adult survival of wild steelhead from Toboggan Creek.

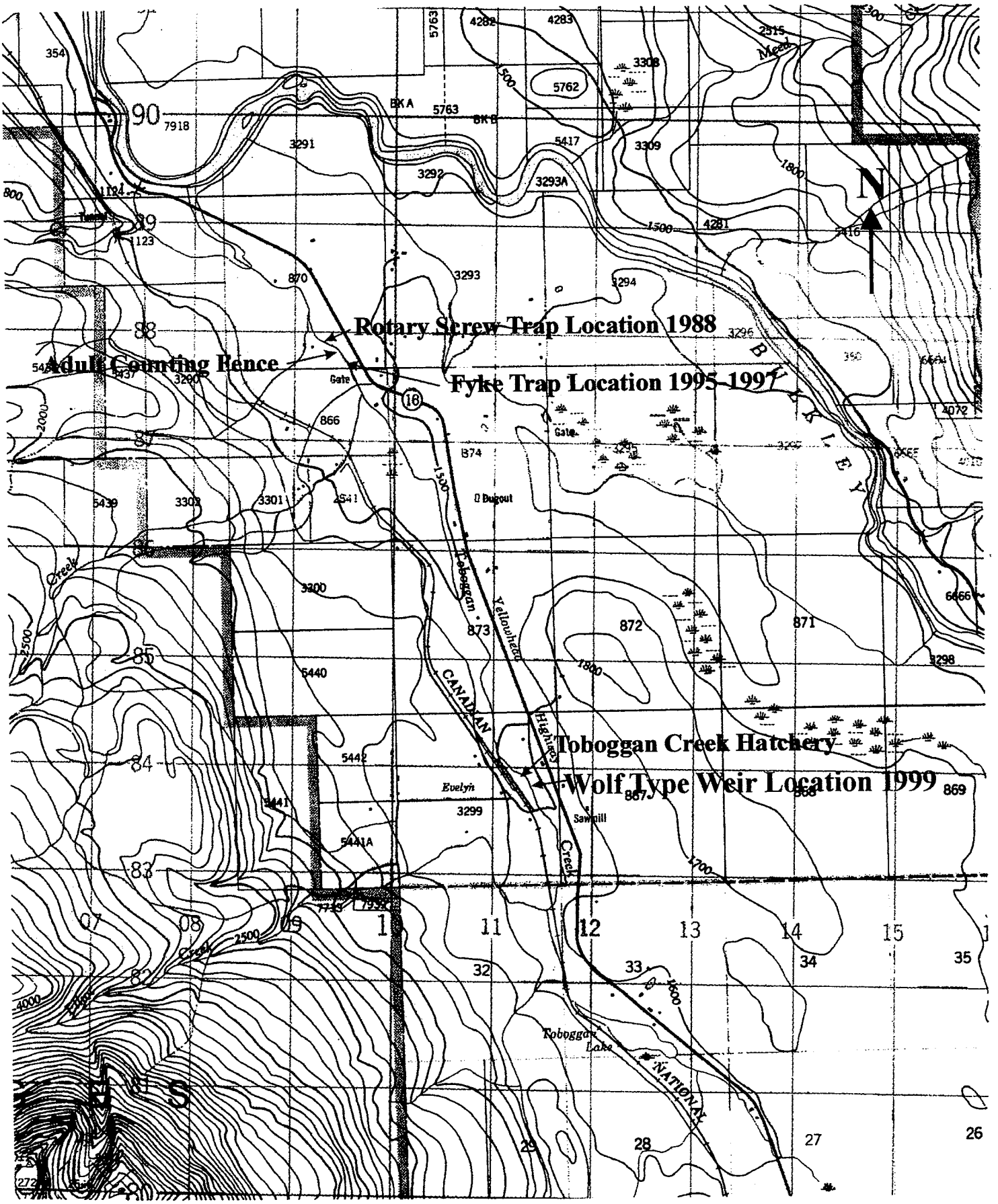

Figure 1. Location of study site (approximate scale = 1:50,000)

The Toboggan Creek smolt fence study had the following objectives:

- to construct, install and maintain a temporary wolf type trap,
- to identify to species and enumerate all fish captured in the trap,
- to collect standard biological data from a random sample of all fish captured,
- to mark natural origin coho using adipose fin clips and coded wire tags,
- to estimate the rate of tag loss,
- to remove and store all fish fence components for future use, and
- to summarize the field program, methodologies, and sampling results in a formal report.

2.0 Materials and Methods

2.1 Study Site

A site just upstream of the Toboggan Creek hatchery was chosen for the location of the smolt enumeration fence (Figure 1). The site was chosen due to its easy access, relatively uniform substrate, well developed banks, and lack of side or backwater channels. The site allowed for the construction of a wolf type weir across the majority of the channel width. The margins of the channel were sealed with seine nets and removable panels to allow for a maximum interception of migrating smolts (Figure 2).

2.2 Fence Design and Construction

The Toboggan Creek smolt enumeration fence consisted of a wolf type design. The frame of the fence was constructed of 2" by 4" lumber, and fence panels were removable from the frame to facilitate fence opening during high water levels. The fence panels were approximately 35" tall and 24" wide, and were covered with ¼" galvanized hardware cloth. The fence was equipped with a polyethelyne apron to minimize scouring and escape of fish. Two live boxes and a holding tank were constructed of 2" by 4" lumber and plywood. The fence frame, live boxes and holding tanks were anchored using rebar. Upstream passage of steelhead was provided in the upstream portion of the "W" via an opening that could be sealed during maximum smolt migration rates. Downstream passage of steelhead was provided by temporarily removing selected fence panels during the day, when smolt migration rates were low. The fence was constructed and installed between May 3 and May 18, 1999.

2.3 Fence Maintenance

The fence was monitored and cleaned regularly, including day and night. The fence was monitored continually during moderate and high flows, and checked periodically when panels were removed (during flood conditions; May 23 to May 25, and June 12 – June 19, 1999) and at low flow conditions. Live boxes were emptied on a regular basis, and fish were transferred to a holding tank. Fish were processed in the morning during low migration rates, and during night and day during peak migration. Removal of fish from the live boxes decreased

densities in the live boxes, resulting in reduced mortality and injury to fish. Processing of fish during the night at peak migration rates allowed for shorter handling time and reduced stress on fish, and kept fish densities in the live boxes and holding tanks to a minimum.

Water and ambient temperature, weather conditions, staff gauge readings (at the hatchery) and subjective notes on weir performance (low, medium, and high) were recorded at least once per day during the operations of the fence.

2.4 Fish sampling

All fish other than fry captured in the traps were transported to the Toboggan Creek fish hatchery for processing. Fry captured in the trap were estimated, and released prior to transporting fish to the holding tank and hatchery. At the hatchery, fish were sorted roughly by size, anaesthetized using MS 222, and identified to species.

Of the natural origin coho captured, a random subsample of 10% (not to exceed ~ 100 per day) were measured and weighed at the hatchery, in conjunction with the coded wire tagging protocol (see section 2.5 below). Fulton's condition factor was determined for coho (Ricker 1975). Scale smears (10 smears per 5 mm size category) were taken from anaesthetized coho. Weight and length data were also collected of all other species captured, except lamprey.

2.5 Coded wire tagging

Coho transported to the Toboggan Creek hatchery were coded wire tagged and adipose clipped. Ten percent of captured coho (up to 100 fish per day) were chosen at random, measured and weighed (see section 2.4). For tagging, smolts were divided into two size groups (75-100 mm and 101 mm or greater) to roughly represent two different age classes (age 1+ and 2+ respectively). A different coded wire tag was applied to distinguish between these two size groups. Coho were anaesthetized using MS222 prior to tagging. Prior to tagging, each coho was checked for physical damage or scale loss. The incidence of physical damage and/or scale loss was recorded, and fish exhibiting physical damage or scale loss were not included in the number of fish that were coded wire tagged. Following tagging, coho were allowed to recover in the hatchery, if possible, prior to their release. The total number of coho tagged, or a sub-sample of at least 200 coho, representing a variety of sizes were retained overnight except after June 10, when all tagged coho were released upon tagging. Time constraints and lack of availability of the hatchery facility during peak migration necessitated the release of all coho upon tagging during some days. Smolts with no tags after 24 hours were re-tagged with the appropriate code prior to release.

2.6 Trap efficiency

Trap efficiency was determined subjectively each day. Trap efficiency was determined by water level, scouring under the fence panels, ability of fish to migrate past the fence through openings (e.g. along stream margins and steelhead opening), debris, and necessity to remove

Trap efficiency was tested at three times during the operation of the fence, during the early, peak and late section of the smolt run. Up to 200 marked smolts were released above the trap, and recaptures were enumerated at the fence. Each batch of coho was marked differently (upper caudal and adipose, lower caudal and adipose, upper caudal only) to allow for three separate evaluations of trap efficiency. Mark-recapture rates were used to determine adjusted Petersen estimates (Ricker 1975).

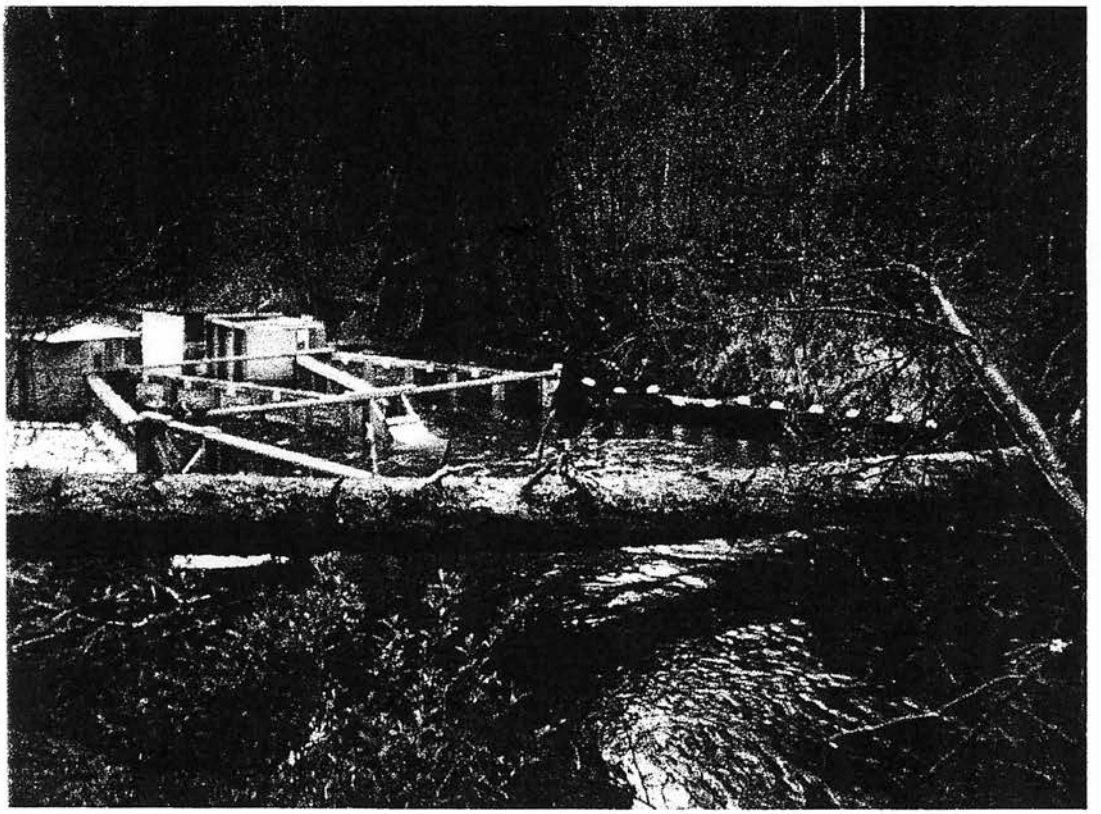

Figure 2. Wolf type weir used at Toboggan Creek in the spring of 1999.

3.0 Results and Discussion

3.1 Discharge and Temperature

Although snow pack at the beginning of spring was normal, cool spring conditions delayed snow melt in April and early May, resulting in a higher than normal snow pack toward the middle and end of May. Cool weather, coupled with showers, resulted in only moderate fluctuations in water level in mid to end of May. Peak discharge (indicated by high staff gauge readings) has been noted in the last week of May in previous years (May 28/29,1998). Although elevated discharge was noted in the last week of May (staff gauge = 61 cm), water levels were well below the peak water levels recorded on June 15-16 (staff gauge = 103 cm) (Figure 3). Water levels recorded at the hatchery staff gauge (Figure 3) are not directly comparable to water levels recorded at the rotary screw and fyke trap locations. The lowest water level recorded during this study was 34 cm, while the lowest reading recorded in 1998 (a generally low flow year) was 57 cm). The difference in base flows indicate that the hatchery staff gauge readings are approximately 20 cm lower than comparable readings of water height at the fyke trap and rotary screw trap locations. Accounting for this consistent difference, peak water levels in 1999 were considerably higher (103 cm) than peak water levels recorded in 1998 (98 cm – 20 cm = 78 cm), 1997 (~105 cm – 20 cm = 85 cm), 1996 (87 cm – 20 cm = 67 cm) or 1995 (75 cm – 20 cm = 55 cm). High maximum flows were observed throughout the Skeena watershed, and peak flows at Toboggan Creek roughly coincide with flooding of Terrace B.C.. The delayed and high peak flows are due to late snow melt combined with periods of heavy rain.

Peak water levels resulted in increased debris movement in 1999. Increased debris movement, and increased discharge required that fence panels be removed during two periods in the coho smolt weir operation. The fence was open between May 23 and May 25, and again between June 12 and June 19, 1999. These openings coincided with the peak flows, which reached the top of the live boxes (Figure 4). Some larger pieces of debris (logs) were caught against the fence even when fence panels had been removed, and were lifted over the fence. Despite the unusually high flows experienced in the middle of June, the fence frame and live boxes sustained little to no damage. This indicates that the weir location and design should render the weir operational under most flow conditions, and should allow for the maintenance of the frame under all but the highest discharge. The frame allowed for relatively easy re-installation of fence panels once water levels decreased.

Due to the relatively cool spring, water temperatures were slightly below those observed at the fyke trap location in 1998. Maximum water temperatures during the study were recorded on June 11-12 (12°C). This maximum temperatures were lower than that recorded for 1998 (15°C on June 7, 1998), or 1995 (13.5°C on May 25, 1995), but is similar to those observed in 1996 and 1997 (12°C and 13°C respectively). Temporal trends for water temperature in 1999 are similar to those observed in previous years. Although there was considerable fluctuation in water temperature throughout the study, water temperature generally increased over the duration of the study period. Peak water temperatures were observed on June 10, just prior to peak discharge (Figure 3).

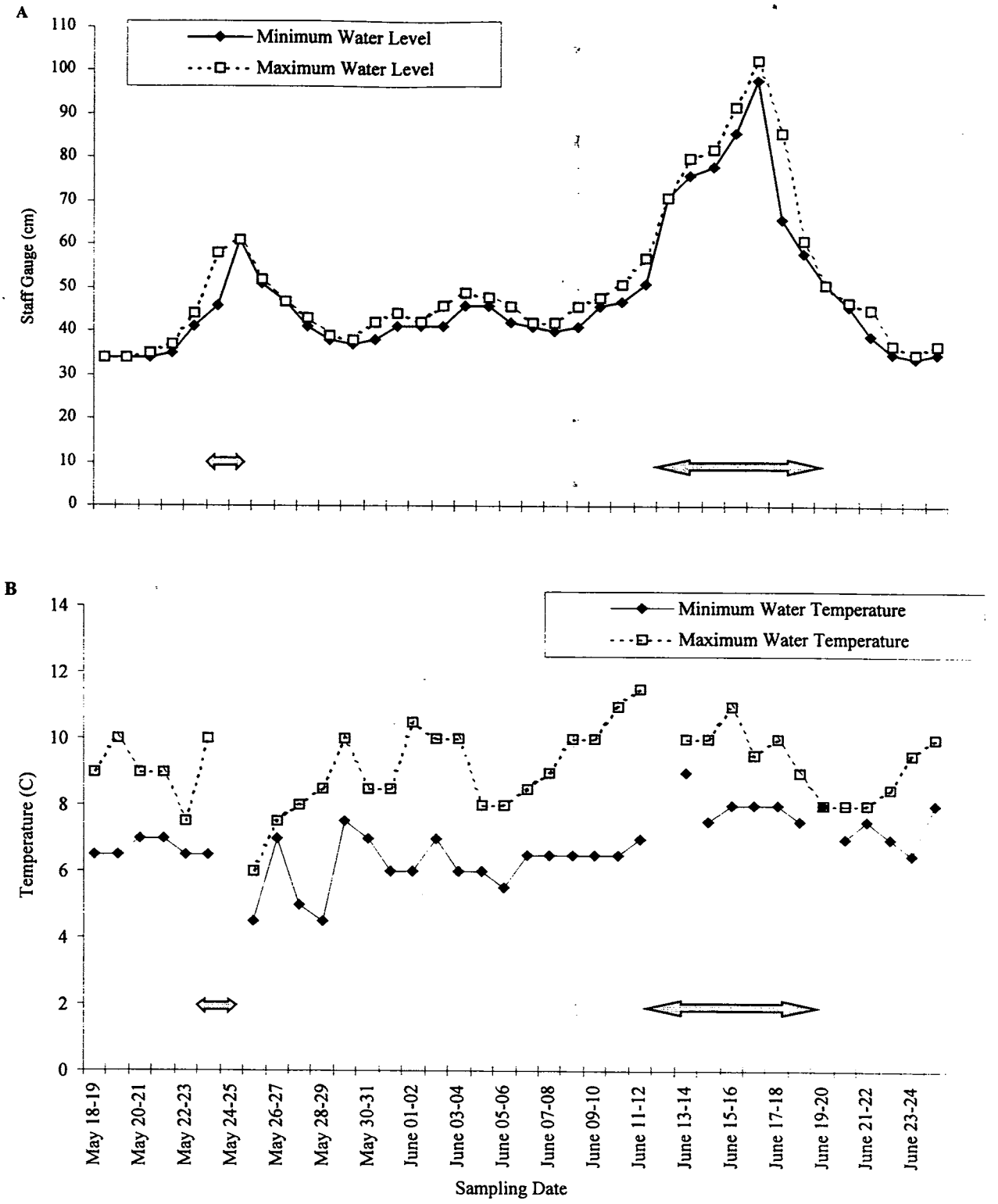

Figure 3. Staff gauge readings (A) and water temperature (B) recorded at the Toboggan Creek fish hatchery, just downstream of the Toboggan Creek smolt weir in 1999. Grey arrows indicate times when fence panels were removed.

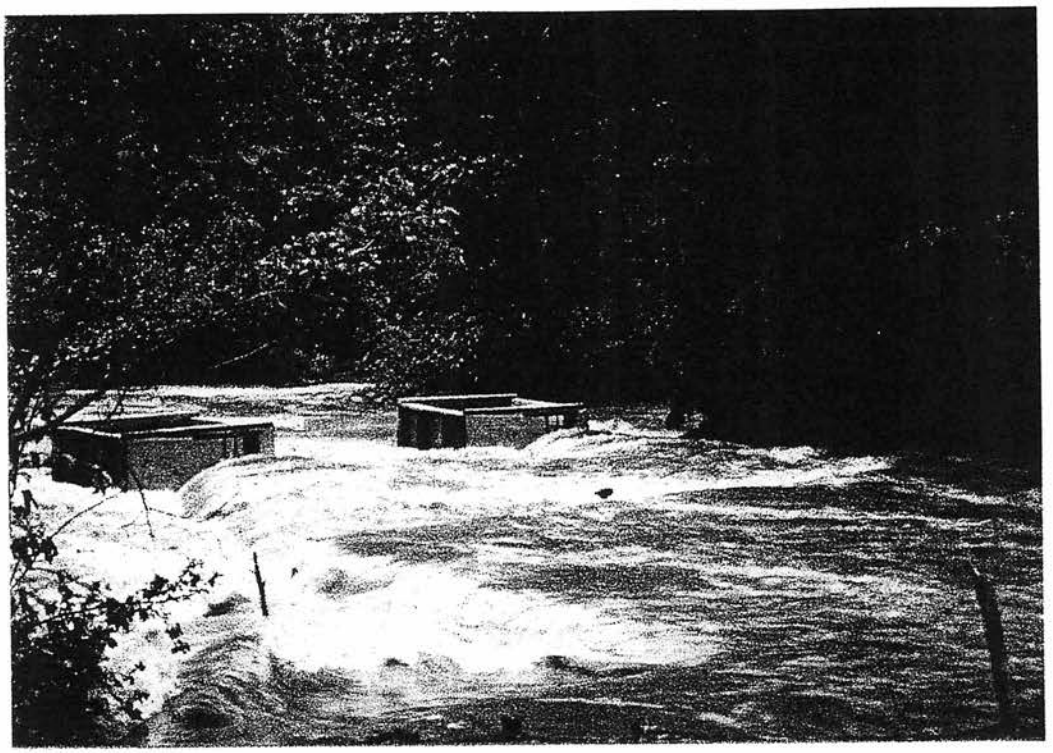

Figure 4. Wolf type weir used at Toboggan Creek in the spring of 1999 during high flows. The fence panels were removed during this high flow event.

3.2 Trap performance

In general, the wolf type weir operated well at all but the highest flow condition. Moderate to high flow condition required continual monitoring and cleaning of the weir. Initially, some coho fry mortalities were noted in the live boxes, but fry mortality was reduced by removing fry from the live box and releasing them at regular intervals. Some scale loss and other injuries (e.g. bruising, fin abrasion) was also observed (about 4.4% of coho captured), and the incidence of scale loss was reduced by transporting fish from live boxes into the holding tank.

At low flows, fish were able to move back out of the live box. However, the proportion of fish which may have exited the live box is likely low. In addition, when the weir was in operation, fish could not easily circumvent the weir. When the weir was fully operational, it is estimated that the majority of migrating smolts were captured in the live boxes.

The steelhead opening in the upstream V of the weir was closed during peak smolt migration (midnight to dawn on most days, dusk till dawn during peak smolt migration), and was opened periodically during the day to allow steelhead to move upstream and downstream through the weir. Some steelhead had difficulty finding the opening, especially fish attempting to move downstream. Fence panels were removed on occasion to aid the steelhead in migrating past the weir.

Despite high flows encountered during the 1999 coho smolt enumeration project, the weir was operational for most days. High flows necessitated the removal of fence panels on May 23 – 25, and again on June 12 – June 19. During the second peak, water levels reached the top of the live boxes (Figure 4), but the fence frame, live boxes and holding tanks remained relatively undamaged. Some scouring was noted at the fence during high flows, and the polyethylene aprons attached to the fence was not completely effective in reducing the scouring.

3.3 Coho Abundance, Size and Tagging

3.3.1 COHO ABUNDANCE

During previous years, coho abundance was estimated by enumerating wild and hatchery smolts, and comparing to the number of known hatchery coho released (Table 1). However, in the 1999 field season, the weir was constructed upstream of the hatchery outflow, and no hatchery origin smolts were captured. Three separate releases of marked coho upstream of the weir was used to estimate weir efficiency, and the number of wild coho in the system (Tables 2 - 5).

The three separate mark-recapture experiments show resulted in 12% and 21% of the marked fish being recaptured in the wolf type weir. Trap efficiency was reduced during periods of high flows, when the fence panels had to be removed. Since high flows occurred near or at the peak of coho smolt migration, it not surprising that a significant number of coho were not captured in the weir. The fence location and slight modifications to the design should allow the fence to remain operational during most flows. It is important to recognize that peak flows encountered in the spring of 1999 were exceptionally high. With more moderate flow conditions, which may be encountered in the spring of 2000, it is anticipated that a larger proportion of coho smolts can be captured and tagged at the weir using this methodology.

Re-capture rates for the smaller size group of coho smolts appears to be slightly higher than re-capture rates of smolts greater than 100 mm. It is possible that larger smolts choose to migrate during higher flows, and exhibited peak migrations during the time the fence panels were removed. Smaller fish may have a peak that was shifted from that of the larger fish, resulting in a higher proportion of the smaller size class being encountered in the weir. Alternatively, mortality may be different between the two size groups. However, this is mere speculation, and it is not known why the recapture rates of the two size groups should differ.

Although comparisons in abundance between the 1999 field season and the data previously collected for smolts at Toboggan Creek is difficult, adjusted Petersen estimates for the different years appear to be relatively similar (Tables 1 and 5). Confidence intervals generated for the mark-recaptured experiments (Tables 3-5) encompass the adjusted Petersen estimate calculated for the ratio of wild to hatchery fish captured downstream of the hatchery in pervious years (Table 1). Comparisons of estimates of population size determined in future years to the estimate generated for 1999 should allow comparisons of wild smolt production at Toboggan Creek.

Table 1. Summary of estimated total numbers of wild and hatchery coho during in the five years of the Toboggan Creek coho smolt enumeration project.

Year	# wild coho captured	# hatchery coho captured	ratio of wild:hatchery coho	# hatchery coho released	adjusted Petersen estimate for wild coho	method used to enumerate smolts
1995	2,867	2,552	**1.12:1**	not available	**insufficient data**	fyke trap
1996	1,829	1,692	**1.08:1**	32,638	**35,280.2**	fyke trap
1997	1,628	1,276	**1.27:1**	33,255	**42,422.9**	fyke trap
1998	408	208	**1.96:1**	33,935	**66,410.6**	rotary screw trap
1999	7215	none	**not applicable**	40,468	**not applicable**	fence [1]

[1] the fence used in coho smolt enumeration in 1999 was located upstream of the hatchery. Therefore, no coho of hatchery origin were captured in 1999.

Table 2. Summary of mark-recaptured data for four separate groups of marked coho smolts released upstream of the Toboggan Creek smolt enumeration weir to estimate weir performance, and the number of wild smolts upstream of the weir.

Mark*	Dates released (1999)	# released		Dates recaptured (1999)	# recaptured		total # captured[88]		adjusted Petersen estimate	
		60-100 mm	>100 mm		< 100 mm	> 100 mm	< 100 mm	> 100 mm	< 100 mm	> 100 mm
1	May 27-31	100	100	May 28-June 12	16	17	1596	5287	9,488.1	29,671.6
2	June 4	100	100	June 4-5	21	12	1596	5287	7,331.7	41,075.9
3	June 11	100	100	June 11-12	15	12	1596	5287	10,081.1	41,075.9
all	May 27–June 11	300	300	May 28-June 12	52	41	1596	5287	9,069.8	38,023.2

* mark 1 = lower caudal, coded wire tag and adipose clip; mark 2 = upper caudal, coded wire tag and adipose clip, mark 3 = lower caudal clip

[88] total captured reported in this table to do not include 117 mortalities of undetermined size and 215 un-tagged smolts of undetermined size. These fish were included in the total number of wild coho captured reported in Table 1.

Table 3. Adjusted Petersen estimates (N*) and confidence intervals determined for the mark-recapture estimates of population size for coho smolts between 60 and 100 mm fork length conducted at Toboggan Creek in the spring of 1999. Confidence intervals were determines assuming a Poisson distribution for the number of recaptured fish (Ricker 1975).

Mark	N^*	lower confidence limit	upper confidence limit
1	9,488.1	5,974.0	15,813.4
2	7,331.7	4,887.8	11,521.2
3	10,081.1	6,251.8	17,159.3
combined	9,069.8	6,934.5	11,863.2

Table 4. Adjusted Petersen estimates (N*) and confidence intervals determined for the mark-recapture estimates of population size for coho smolts larger than 100 mm fork length conducted at Toboggan Creek in the spring of 1999. Confidence intervals were determined assuming a Poisson distribution for the number of recaptured fish (Ricker 1975).

Mark	N^*	lower confidence limit	upper confidence limit
1	29,671.6	18,939.9	50,385.7
2	41,075.9	24,276.7	74,178.9
3	41,075.9	24,276.7	74,178.9
combined	38,023.2	28,022.7	52,531.0

Table 5. Adjusted Petersen estimates (N*) and confidence intervals determined for the mark-recapture estimates of population size for all coho smolts at Toboggan Creek in the spring of 1999. Confidence intervals were determined assuming a Poisson distribution for the number of recaptured fish (Ricker 1975).

Mark	N^*	lower confidence limit	upper confidence limit
1	42,659.3	29,905.5	59,200.7
2	42,269.3	29,905.5	59,200.7
3	51,800.6	35,034.2	74,000.8
combined	44,480.5	35,963.7	53,851.8

The timing of the mark-recapture experiments appeared to influence re-capture patterns of coho smolts at the weir. Recaptures were encountered over a longer time period for the first mark-recapture experiment than for the last two experiments (Table 2). This may be due to the fact that some of the fish marked during the first mark-recapture experiment were captured in minnow traps, and not in the weir. These fish may not have intended to migrate downstream early in the season, and remained upstream of the weir for a longer time period following tagging. In addition, it is conceivable that smolts have greater flexibility in their migration patterns early in the season, but exhibit a more strict migration rate during and after the peak of smolt migration. Smolts initially marked near or during the peak of smolt migration appeared to be re-captured at the weir within 48 hours of initial tagging.

The larger size class of smolts appeared to predominate the catch of smolts at the Toboggan Creek weir in 1999. These fish are likely age 2+, and resulted from a moderate to poor escapement year at Toboggan Creek in 1996 (866 adult coho upstream of the adult fence, Table 6). The smaller size class of smolts resulted from a poor escapement year in 1997 (376 adult coho upstream of the adult fence, Table 6). If the size distribution of juvenile coho smolts are a direct reflection of adult coho escapement in the system, the number of coho smolts < 100 mm (assumed to be primarily age 1+) are expected to predominate in the smolt migration at Toboggan Creek in spring 2000.

Table 6. Adult coho escapement recorded for 1993, 1994. 1995. 1996. 1997 and 1998. Numbers are courtesy of Mike O'Neil (pers. comm. 1999)

Year	Total Number	# upstream of fence	# females
1993		1700	
1994		2430	
1995	1854	1762	• 671 females upstream of fence (25 were used for brood stock) • 35 females downstream of fence
1996	1166	866	• 289 females upstream of fence (20 females were hatchery brood stock) • 83 females downstream of fence
1997	394	376	• number of females not available
1998	2470	1970	• number of females not available

As in previous years, two peaks of capture rates were noted during the coho smolt migration at Toboggan Creek. The first, smaller peak occurred between May 30 and June 4, 1999, while the second, larger peak occurred between June 8 and June 12, 1999 (Figure 5). Both peaks coincided with increases in water temperature (Figure 3B), and increases in water level (Figure 3A). The second peak in capture rates appeared to signal peak migration rates of coho smolts, which coincided with peak flows and water temperatures. The fence panels had to be removed due to high flows however, indicating that a significant proportion of migrating coho smolts were not encountered while the weir was operational.

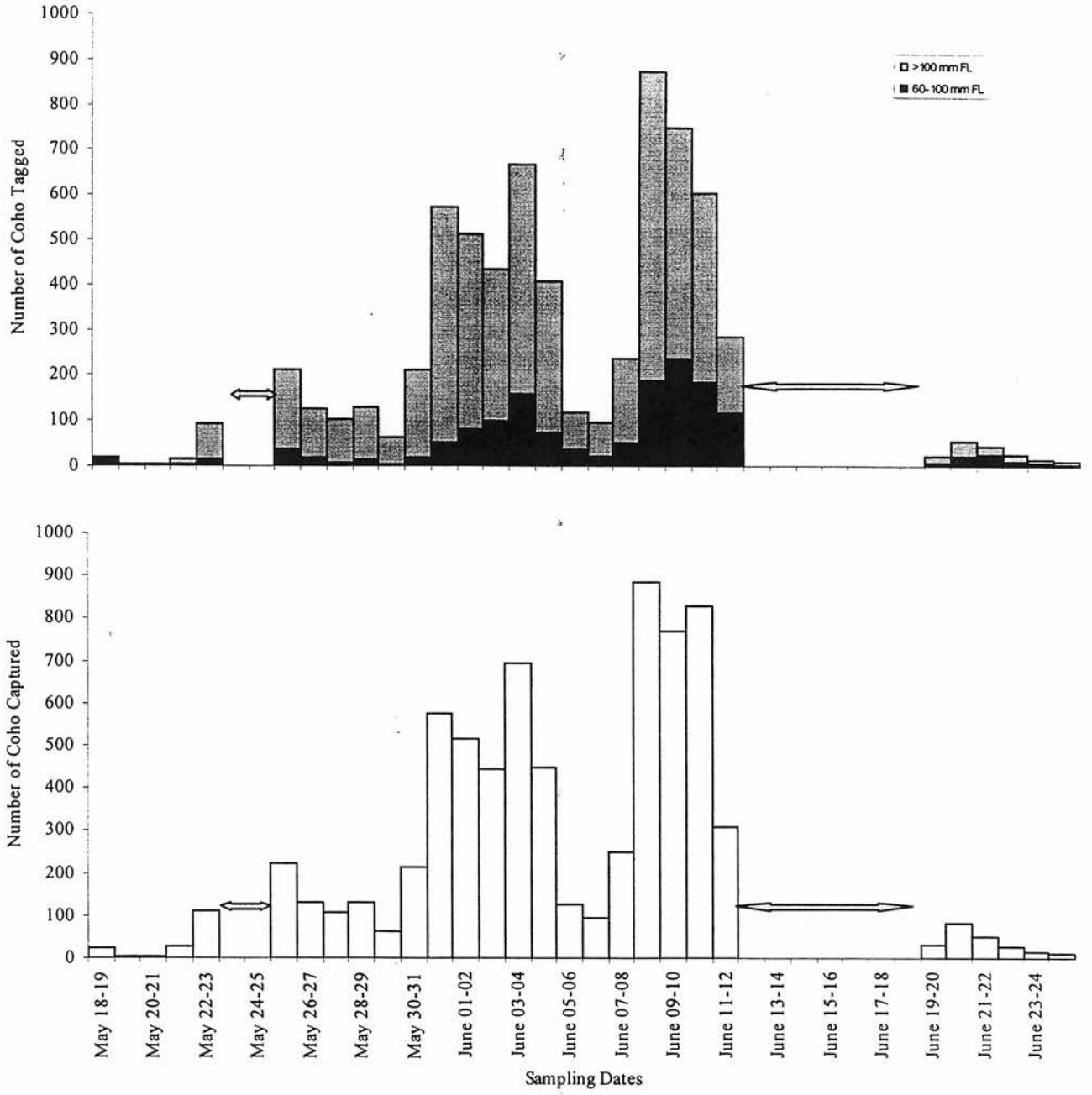

Figure 5. Number of coho captured in the Toboggan Creek smolt enumeration weir in May and June 1999. The upper graph shows the number of coho that were coded wire tagged, while the lower graph indicates the total number of smolts captured. Grey arrows indicate periods where the weir was not operational due to high discharge (see Figure 3).

3.3.2 COHO SIZE

Of the 7215 coho smolts captured during the smolt enumeration project, 1474 were measured (20.5%), and 1466 were weighed (20.4%) (Table 7). Fulton's condition factor was determined for all coho for which length and weight data were collected (Table 7). Coho fork length ranged between 54 and 205 mm, while weight ranged between 0.8 and 6.5 g, and the Fulton's condition factor ranged between 0.48 and 2.12 for the duration of the study. Mean condition factor and weight remained relatively consistent throughout the coho smolt enumeration program, but fork length was more variable at the beginning of the study. The variability may be due to some coho measured initially being captured in minnow traps rather than the smolt enumeration weir. The two different type of traps may have selected for different fish, based on behaviour and/or size. Mean fork length stabilized shortly after the beginning of the study, and showed a gradual and minor decrease as the study progressed, similarly to trends observed in 1997.

3.3.3 COHO TAGGING

Of the 7215 coho captured during the coho smolt enumeration project, 1539 smolts less than 100 mm and 5196 smolts greater than 100 mm were coded wire tagged (total of 6735 smolts). A sub-sample of coho were retained to check overnight tag retention during most of the study (4,928 smolts, 73 %). The percent of overnight tag retention varied between 66.7% and 100% (Tables 8 and 9), and increased at the beginning of the study as the crew learned to use the tagging machine more effectively. When adjusted for the percent tag retention for each day, the number of coho smolts marked that retained their tag is estimated to be 6589 (1505 < 100 mm and 5084 > 100 mm) (Tables 8 and 9).

Tag retention for the smaller size group of coho appeared to be slightly better than for the larger size group particularly at the beginning of the study (Tables 8 and 9). The variability in the head size of fish less than 100 mm in fork length was less than the variability in head size for the larger fish, and head molds required less adjustments for the smaller size group. Head molds required more frequent adjustments for the larger size groups, and needle depth during the initial days of tagging may have been insufficient to penetrate the cartilage of the fish, resulting in a higher frequency of tag loss. Overnight mortalities due to tagging were low for both size groups (14 fish, 0.3%).

Table 7. Summary of length and weight distribution of wild coho through out the 1999 coho smolt enumeration project.

Date	Fork Length (mm)				Weight (g)				Fulton's Condition Factor			
(1999)	N	Mean	SD	Range	N	Mean	SD	Range	N	Mean	SD	Range
May 18-19	24	82.0	10.52	61-98	24	6.40	2.127	2.8-10	24	1.12	0.083	0.89-1.27
May 19-20	5	99.2	24.47	62-122	5	10.82	6.359	2.4-18.1	5	0.98	0.050	0.92-1.04
May 20-21	3	89.3	28.31	72-122	3	9.13	8.204	4.1-18.6	3	1.09	0.068	1.02-1.16
May 21-22	15	114.7	15.32	82-134	15	16.79	7.138	6.7-36.6	15	1.06	1.061	0.91-1.52
May 22-23	116	113.4	17.88	55-160	116	15.34	6.031	2.5-40.0	116	1.01	0.115	0.50-1.50
May 25-26	92	104.4	24.28	44-205	92	13.40	8.297	0.8-66.5	92	1.05	0.091	0.77-1.25
May 26-27	64	114.1	15.98	65-165	64	15.41	6.284	3.2-49.0	64	0.99	0.057	0.87-1.17
May 27-28	55	110.6	15.56	46-139	55	14.32	5.040	0.9-26.7	55	1.01	0.071	0.77-1.23
May 28-29	52	114.5	11.49	71-143	52	15.40	4.197	3.8-29.3	52	1.00	0.079	0.82-1.34
May 29-30	65	115.4	10.24	89-142	65	16.00	4.020	7.9-27.8	65	1.02	0.053	0.87-1.13
May 30-31	54	117.4	12.37	97-153	54	16.89	6.192	9.8-36.7	54	1.01	0.053	0.84-1.15
May 31-June 1	61	112.1	10.40	93-141	60	14.74	4.453	7.6-30.2	60	1.03	0.064	0.89-1.21
June 1-2	62	112.8	10.95	83-159	62	14.57	5.562	6.0-49.5	62	0.98	0.052	0.90-1.23
June 2-3	55	108.5	8.78	83-130	55	12.84	3.221	5.8-23.0	55	0.99	0.050	0.85-1.11
June 3-4	67	108.3	11.81	76-146	67	12.99	4.700	4.6-33.7	67	0.99	0.049	0.85-1.09
June 4-5	57	103.4	11.17	68-126	50	12.09	3.183	4.5-20.8	50	1.03	0.051	0.07-1.19
June 5-6	50	106.8	7.66	90-124	50	12.12	2.702	7.5-18.4	50	0.98	0.045	0.90-1.05
June 6-7	55	107.2	8.45	93-136	55	12.78	3.155	8.5-26.1	55	1.02	0.048	0.92-1.12
June 7-8	60	110.4	10.30	92-141	60	13.66	3.964	7.6-27.5	60	0.99	0.046	0.87-1.12
June 8-9	88	104.7	10.70	54-125	88	11.93	3.343	1.6-19.5	88	1.01	0.046	0.92-1.14
June 9-10	0				0				0			
June 10-11	118	103.5	9.13	72-127	118	11.66	3.043	3.9-21.5	118	1.03	0.049	0.87-1.19
June 11-12	51	101.6	10.19	72-119	51	11.21	3.215	4.1-19.3	51	1.04	0.058	0.88-1.17
June 19-20	26	100.5	13.75	65-125	26	11.06	3.815	2.8-21.2	26	1.04	0.075	0.93-1.27
June 20-21	74	96.7	15.81	48-120	74	10.42	4.048	1.6-18.9	74	1.09	0.093	0.85-1.45
June 21-22	48	95.2	14.32	67-125	48	9.78	4.046	3.2-20.6	48	1.07	0.076	0.86-1.20
June 22-23	28	98.25	17.016	56-144	28	10.41	3.477	2.0-16.8	28	1.08	0.239	0.48-2.12
June 23-24	17	99.294	13.19	69-121	17	10.34	3.786	3.5-18.8	17	1.01	0.071	0.85-1.10
June 24-25	12	94.75	16.928	54-114	12	9.38	3.811	1.9-14.2	12	1.04	0.097	0.86-1.21

Table 8. Coho coded wire tag retention for coho smolts between 60 and 100 mm fork length during the initial 24 hours after marking.

Date (1999)	# tagged	# that did not retain tags[1]	% tag retention	estimated number of coho that retained tag (accounting for re-tagging)
May 18-19	19	2	89.5	19
May 19-20	1	0	100	1
May 20-21	2	0	100	2
May 21-22	3	0	100	3
May 22-23	14	0	100	14
May 25-26	39	0	100	39
May 26-27	17	0	100	17
May 27-28	9	0	100	9
May 28-29	14	2	85.8	14
May 29-30	4	0	100	4
May 30-31	20	0	100	20
May 31-June 1	51	8	84.4	50
June 1-2	83	5	94	83
June 2-3	101	14	86.2	99
June 3-4	162	14	91.4	161
June 4-5	73	3	95.9	73
June 5-6	37	0	100	37
June 6-7	22	1	95.5	22
June 7-8	53	0	100	53
June 8-9	189	2	99.0	189
June 9 - 25	626	not determined	~94.5	596
combined	1539		94.5	**1505**

Table 9. Coho coded wire tag retention for coho smolts greater than 100 mm fork length during the initial 24 hours after marking.

Date (1999)	# tagged	# that did not retain tags[1]	% tag retention	estimated number of coho that retained tag (accounting for re-tagging)
May 18-19	0	0	n.a.	0
May 19-20	3	1	66.7	3
May 20-21	1	0	100	1
May 21-22	12	3	75.0	11
May 22-23	79	26	67.1	70
May 25-26	187	10	94.3	174
May 26-27	110	23	79.1	105
May 27-28	97	6	93.9	97
May 28-29	116	12	89.7	115
May 29-30	28	9	84.5	57
May 30-31	192	23	88.1	189
May 31-June 1	525	27	94.9	524
June 1-2	431	21	95.2	430
June 2-3	337	42	87.6	332
June 3-4	508	23	95.5	507
June 4-5	339	22	93.6	338
June 5-6	84	3	96.5	84
June 6-7	74	0	100	74
June 7-8	187	1	99.5	187
June 8-9	687	9	98.7	687
June 9 – 25	1199	not determined	~93.5	1099
combined	5196		93.5	**5084**

3.4 Other species

Other species caught in the smolt weir during the study include rainbow trout / steelhead, cutthroat trout, Dolly Varden, mountain whitefish longnose suckers and lampreys (Table 7). Cutthroat trout had not been captured in 1995 or 1996, but were captured in 1997 and 1998. Chinook were present in low numbers in previous smolt enumeration studies at Toboggan Creek, but were not encountered during the operation of the weir in the spring of 1999. Lampreys and frogs were caught on a regular basis through out the study.

As in the previous years of the coho smolt enumeration project, rainbow trout/steelhead was the second most abundant species captured. A total of 202 rainbow trout/steelhead were captured in the wolf type weir constructed upstream of the Toboggan Creek hatchery. Few rainbow trout/steelhead were captured initially, but the number of juvenile rainbow trout/steelhead increased, indicating that peak migration of this species occurs after peak migration of coho smolts. Pacific Lamprey was the third most abundant species (108 lamprey), and Dolly Varden was the fourth most abundant species (52 Dolly Varden),

cutthroat trout were captured during this study than in previous years. Longnose suckers were rarely captured during the coho smolt enumeration project, and had not been captured in previous years.

4.0 Recommendations

1. Toboggan Creek should be used as an index stream to monitor fluctuations in freshwater productivity, juvenile survival, and possible smolt to adult survival of coho in the Bulkley River watershed.

2. The wolf type weir constructed at Toboggan Creek allowed for feasible maintenance and removal of panels during high flows. Minor modifications to the design of the weir may reduce the scouring which resulted from weir installation at selected site.

3. The site chosen for installation of the weir allowed for easy installation of the structure, and facilitated access to the trapping site. It is suggested that the same site be used in future years. Large woody debris located upstream of the trapping site should be anchored prior to installation of the fence, and a leaning tree at the trapping location should be secured or removed for safety.

4. The duration of the smolt enumeration project allowed for the capture of a significant proportion of the smolts. It is assumed that the majority of coho smolts that were not captured migrated during peak flow, which necessitated the removal of the fence panels. The timing and duration of the smolt enumeration project was adequate to allow for maximum capture rates of coho.

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Appendix 1. Weir performance, fish capture summary and tagging summary for the Toboggan Creek coho smolt enumeration project, 1999

Toboggan Creek Smolt Enumeration 1999

Day 1 | Date from: 18-May-99 to: 19-May-99 | Discharge: moderate
Time from: 15:00 to: 8:00 | Trap performance: fair

Perfomance comment: Light debris accumulation. Minimal scouring. Good flow through fences.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
24	0	0	3	214

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	90	0
	>100m	0	X	0	0
	Combined	0	X	90	0
Coho with overnight retention of CWT	<100m	17			17
	>100m	0			0
	Combined	17			17
Coho re-tagged and released immediately	<100m	2	X	90	2
	>100m	0	X	0	0
	Combined	2	X	90	2
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**19**
	>100mm				**0**
	Combined				**19**

Coho Smolts not tagged: 5 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 2 | Date from: 19-May-99 to: 20-May-99 | Discharge: moderate

Time from: 16:50 to: 7:15 | Trap performance: fair

Perfomance comment: Debris accumulation is light. Some fish may be able to escape due to absence of deflector panels

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
5	1	1	2	469

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	67	0
	Combined	0	X	67	0
Coho with overnight retention of CWT	<100m	1			1
	>100m	2			2
	Combined	3			3
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	1	X	67	1
	Combined	1	X	67	1
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**1**
	>100mm				**3**
	Combined				**4**

Coho Smolts not tagged: 1 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 3 | Date from: 20-May-99 to: 21-May-99 | Discharge: moderate
Time from: 14:25 to: 7:00 | Trap performance: fair

Perfomance comment: Debris accumulation is light. Good flow through boxes. Deflectors installed.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
3	1	0	0	307

Chinook	CT	MW	LSU
0	0	0	1

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	2			2
	>100m	1			1
	Combined	3			3
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**2**
	>100mm				**1**
	Combined				**3**

Coho Smolts not tagged: [ ] including [0] mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 4 | Date from: 21-May-99 to: 22-May-99 | Discharge: moderate

Time from: 8:30 to: 8:00 | Trap performance: fair

Perfomance comment: Light debris accumulation. Minor scouring. Smolts able to escape out trap entrance.

Species Summary

Coho	27	RB/ST	4	DV	1	PL	1	Salmonid fry	342
Chinook	0	CT	0	MW	0	LSU	1		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	75	0
	Combined	0	X	75	0
Coho with overnight retention of CWT	<100m	3			3
	>100m	9			9
	Combined	12			12
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	3	X	75	2
	Combined	3	X	75	2
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**3**
	>100mm				**11**
	Combined				**14**

Coho Smolts not tagged: 12 including 12 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 5

Date from: 22-May-99 to: 23-May-99 Discharge: moderate

Time from: 19:00 to: 6:45 Trap performance: good

Perfomance comment: Light debris accumulation. Moderate scouring. Current is strong enough to keep smolts in the traps.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
112	3	2	40	304

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	67	0
	Combined	0	X	67	0
Coho with overnight retention of CWT	<100m	14			14
	>100m	53			53
	Combined	67			67
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	26	X	67	17
	Combined	26	X	67	17
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**14**
	>100mm				**70**
	Combined				**84**

Coho Smolts not tagged: 19 including 1 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 6

Date from: 23-May-99 to: 24-May-99 Discharge: high

Time from: 14:00 to: 7:00 Trap performance: fair

Perfomance comment: Water rose to 58cm by morning. Severe scouring. Panels pulled.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	1	0	7

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 7 Date from: 24-May-99 to: 25-May-99 Discharge very high

Time from: 11:00 to: 16:00 Trap performance

Perfomance comment All panels remain out. Rocks placed in scour holes.

Species Summary

Coho	0	RB/ST	0	DV	0	PL	0	Salmonid fry	0
Chinook	0	CT	0	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 8 | Date from: 25-May-99 to: 26-May-99 | Discharge: high
Time from: 10:50 to: 7:00 | Trap performance: good

Perfomance comment: Fence panels reinstalled. Constant cleaning required.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
224	11	15	4	99

Chinook	CT	MW	LSU
0	0	1	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m		X	0	0
	>100m		X	94	0
	Combined		X	94	0
Coho with overnight retention of CWT	<100m	39			39
	>100m	165			165
	Combined	204			204
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	10	X	94	9
	Combined	10	X	94	9
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**39**
	>100mm				**174**
	Combined				**213**

Coho Smolts not tagged: 10 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 9 | Date from: 26-May-99 to: 27-May-99 | Discharge: moderate
Time from: 16:45 to: 6:15 | Trap performance: good

Perfomance comment: Started traps fishing. Debris accumulation is dropping. Scouring still occurring.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
129	4	1	1	48

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	79	0
	Combined	0	X	79	0
Coho with overnight retention of CWT	<100m	17			17
	>100m	87			87
	Combined	104			104
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	23	X	79	18
	Combined	23	X	79	18
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**17**
	>100mm				**105**
	Combined				**122**

Coho Smolts not tagged: 2 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 10 | Date from: 27-May-99 to: 28-May-99 | Discharge: moderate
Time from: 16:00 to: 8:00 | Trap performance: good

Perfomance comment: Debris accumulation is light. Some scouring.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
109	2	1	0	172

Chinook	CT	MW	LSU
0	1	0	1

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Coho with overnight retention of CWT	<100m	9			9
	>100m	91			91
	Combined	100			100
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	6	X	94	6
	Combined	6	X	94	6
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**9**
	>100mm				**97**
	Combined				**106**

Coho Smolts not tagged: 3 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 11 | Date from: 28-May-99 to: 29-May-99 | Discharge: moderate

Time from: 17:00 to: 8:00 | Trap performance: excellent

Perfomance comment: New fence extension in place. Light debris accumulation.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
130	0	2	2	149

Chinook	CT	MW	LSU
0	1	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	86	0
	>100m	0	X	90	0
	Combined	0	X	89	0
Coho with overnight retention of CWT	<100m	12			12
	>100m	104			104
	Combined	116			116
Coho re-tagged and released immediately	<100m	2	X	86	2
	>100m	12	X	90	11
	Combined	14	X	89	13
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**14**
	>100mm				**115**
	Combined				**129**

Coho Smolts not tagged: 0 (including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 12 Date from: 29-May-99 to: 30-May-99 Discharge: moderate

Time from: 12:00 to: 7:00 Trap performance: excellent

Perfomance comment: Very little debris accumulation

Species Summary

Coho	65	RB/ST	2	DV	2	PL	1	Salmonid fry	120
Chinook	0	CT	0	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	85	0
	Combined	0	X	85	0
Coho with overnight retention of CWT	<100m	4			4
	>100m	49			49
	Combined	53			53
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	9	X	85	8
	Combined	9	X	85	8
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**4**
	>100mm				**57**
	Combined				**61**

Coho Smolts not tagged: 3 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 13 Date from: 30-May-99 to: 31-May-99 Discharge: moderate

Time from: 8:00 to: 7:59 Trap performance: excellent

Perfomance comment: Moderate amount of debris accumulation

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
216	1	0	0	436

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	88	0
	Combined	0	X	88	0
Coho with overnight retention of CWT	<100m	20			20
	>100m	169			169
	Combined	189			189
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	23	X	88	20
	Combined	23	X	88	20
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**20**
	>100mm				**189**
	Combined				**209**

Coho Smolts not tagged: 4 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 14 | Date from: 31-May-99 to: 01-Jun-99 | Discharge: moderate
Time from: 10:30 to: 7:00 | Trap performance: very good

Perfomance comment: Moderate debris accumulation. Scouring created a few large holes.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
576	3	5	0	1540

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	84	0
	>100m	0	X	95	0
	Combined	0	X	94	0
Coho with overnight retention of CWT	<100m	43			43
	>100m	498			498
	Combined	541			541
Coho re-tagged and released immediately	<100m	8	X	84	7
	>100m	27	X	95	26
	Combined	35	X	94	33
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**50**
	>100mm				**524**
	Combined				**574**

Coho Smolts not tagged: 0 (including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 15 | Date from: 01-Jun-99 to: 02-Jun-99 | Discharge: moderate
Time from: 8:00 to: 7:00 | Trap performance: excellent

Perfomance comment: Moderate debris accumulation. Light scouring.

Species Summary

Coho	516	RB/ST	6	DV	0	PL	1	Salmonid fry	234
Chinook	0	CT	1	MW	2	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	94	0
	>100m	0	X	95	0
	Combined	0	X	95	0
Coho with overnight retention of CWT	<100m	78			78
	>100m	410			410
	Combined	488			488
Coho re-tagged and released immediately	<100m	5	X	94	5
	>100m	21	X	95	20
	Combined	26	X	95	25
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**83**
	>100mm				**430**
	Combined				**513**

Coho Smolts not tagged: 2 including 1 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 16 | Date from: 02-Jun-99 to: 03-Jun-99 | Discharge: moderate
Time from: 16:30 to: 7:30 | Trap performance: excellent

Perfomance comment: Debris accumulation is high. Light scouring.

Species Summary

Coho	443	RB/ST	7	DV	5	PL	0	Salmonid fry	790
Chinook	0	CT	4	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	86	0
	>100m	0	X	88	0
	Combined	0	X	87	0
Coho with overnight retention of CWT	<100m	87			87
	>100m	295			295
	Combined	382			382
Coho re-tagged and released immediately	<100m	14	X	86	12
	>100m	42	X	88	37
	Combined	56	X	87	49
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**99**
	>100mm				**332**
	Combined				**431**

Coho Smolts not tagged: 5 including 2 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 17 | Date from: 03-Jun-99 to: 04-Jun-99 | Discharge: moderate

Time from: 8:30 to: 8:00 | Trap performance: good

Perfomance comment: Debris accumulation is high; extensive scouring observed and repaired

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
695	5	2	5	372

Chinook	CT	MW	LSU
0	2	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	91	0
	>100m	0	X	96	0
	Combined	0	X	94	0
Coho with overnight retention of CWT	<100m	148			148
	>100m	485			485
	Combined	633			633
Coho re-tagged and released immediately	<100m	14	X	91	13
	>100m	23	X	96	22
	Combined	37	X	94	35
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**161**
	>100mm				**507**
	Combined				**668**

Coho Smolts not tagged: 25 including 19 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 18 | Date from: 04-Jun-99 to: 05-Jun-99 | Discharge: moderate
Time from: 9:00 to: 8:00 | Trap performance: excellent

Perfomance comment: Had mortalities due to fast current in live box, fixed problem immediately; fence required hourly cleaning

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
448	16	3	2	276

Chinook	CT	MW	LSU
0	0	0	1

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	96	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Coho with overnight retention of CWT	<100m	70			70
	>100m	317			317
	Combined	387			387
Coho re-tagged and released immediately	<100m	3	X	96	3
	>100m	22	X	94	21
	Combined	25	X	94	24
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**73**
	>100mm				**338**
	Combined				**411**

Coho Smolts not tagged: 36 including 29 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 19 | Date from: 05-Jun-99 to: 06-Jun-99 | Discharge: moderate
Time from: 8:00 to: 7:00 | Trap performance: excellent

Perfomance comment: Moderate debris accumulation

Species Summary

Coho	127	RB/ST	3	DV	1	PL	0	Salmonid fry	370
Chinook	0	CT	1	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	97	0
	Combined	0	X	97	0
Coho with overnight retention of CWT	<100m	37			37
	>100m	81			81
	Combined	118			118
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	3	X	97	3
	Combined	3	X	97	3
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**37**
	>100mm				**84**
	Combined				**121**

Coho Smolts not tagged: 6 including 4 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 20 | Date from: 06-Jun-99 to: 07-Jun-99 | Discharge: moderate
Time from: 8:00 to: 7:50 | Trap performance: excellent

Perfomance comment: Light debris accumulation

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
96	4	2	0	440

Chinook	CT	MW	LSU
0	0	1	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	96	0
	>100m	0	X	0	0
	Combined	0	X	96	0
Coho with overnight retention of CWT	<100m	21			21
	>100m	74			74
	Combined	95			95
Coho re-tagged and released immediately	<100m	1	X	96	1
	>100m	0	X	0	0
	Combined	1	X	96	1
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**22**
	>100mm				**74**
	Combined				**96**

Coho Smolts not tagged: 0 (including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 21 | Date from: 07-Jun-99 to: 08-Jun-99 | Discharge: moderate
Time from: 12:30 to: 7:30 | Trap performance: excellent

Perfomance comment: Light debris accumulation.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
249	7	4	3	230

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	99	0
	Combined	0	X	99	0
Coho with overnight retention of CWT	<100m	53			53
	>100m	186			186
	Combined	239			239
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	1	X	99	1
	Combined	1	X	99	1
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**53**
	>100mm				**187**
	Combined				**240**

Coho Smolts not tagged: 9 (including 8 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 22 | Date from: 08-Jun-99 to: 09-Jun-99 | Discharge: moderate

Time from: 8:00 to: 7:00 | Trap performance: excellent

Perfomance comment: Light debris accumulation

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
885	16	0	0	316

Chinook	CT	MW	LSU
0	9	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	99	0
	>100m	0	X	99	0
	Combined	0	X	99	0
Coho with overnight retention of CWT	<100m	187			187
	>100m	678			678
	Combined	865			865
Coho re-tagged and released immediately	<100m	2	X	99	2
	>100m	9	X	99	9
	Combined	11	X	99	11
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**189**
	>100mm				**687**
	Combined				**876**

Coho Smolts not tagged: 9 including 5 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 23 Date from: 09-Jun-99 to: 10-Jun-99 Discharge: moderate

Time from: 8:00 to: 7:00 Trap performance: excellent

Perfomance comment: Moderate debris accumulation

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
769	11	1	1	292

Chinook	CT	MW	LSU
0	3	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	239	X	95	227
	>100m	516	X	94	485
	Combined	755	X	94	712
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 14 including 7 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 24 | Date from: 10-Jun-99 to: 11-Jun-99 | Discharge: high
Time from: 9:00 to: 7:00 | Trap performance: excellent

Perfomance comment: Debris accumulation is high

Species Summary

Coho	830	RB/ST	16	DV	0	PL	11	Salmonid fry	598
Chinook	0	CT	1	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	188	X	95	179
	>100m	419	X	94	394
	Combined	607	X	94	573
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 223 including 15 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 25 | Date from: 11-Jun-99 to: 12-Jun-99 | Discharge: high
Time from: 9:40 to: 1:52 | Trap performance: fair

Perfomance comment: High degree of debris accumulation. Panels removed at night.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
311	3	1	15	379

Chinook	CT	MW	LSU
0	1	3	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	121	X	95	115
	>100m	166	X	94	156
	Combined	287	X	94	271
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 24 including 8 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 26 | Date from: 12-Jun-99 to: 13-Jun-99 | Discharge: very high
Time from: 23:40 to: 23:40 | Trap performance:

Perfomance comment: Trap is not operational - high water.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	0	0	0

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: [ ] including [0] mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 27 | Date from: 13-Jun-99 to: 14-Jun-99 | Discharge: very high

Time from: 10:00 to: 0:30 | Trap performance:

Perfomance comment: Trap is not operational - high water.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	0	0	0

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 28 | Date from: 14-Jun-99 to: 15-Jun-99 | Discharge: very high

Time from: 9:00 to: 0:20 | Trap performance:

Perfomance comment: Trap is not operational - high water.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	0	0	0

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 29 | Date from: 15-Jun-99 to: 16-Jun-99 | Discharge: very high
Time from: 8:30 to: 23:00 | Trap performance:

Perfomance comment: Trap is not operational - high water. Water level is rising.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	0	0	0

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 30 | Date from: 16-Jun-99 to: 17-Jun-99 | Discharge: very high
Time from: 9:00 to: 21:00 | Trap performance:

Perfomance comment: Trap is not operational - high water. Water level is rising.

Species Summary

Coho	0	RB/ST	0	DV	0	PL	0	Salmonid fry	0
Chinook	0	CT	0	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 31 | Date from: 17-Jun-99 to: 18-Jun-99 | Discharge: very high
Time from: 9:00 to: 19:00 | Trap performance:

Perfomance comment: Trap is not operational - high water. Water level is dropping.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	0	0	0

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 32 | Date from: 18-Jun-99 to: 19-Jun-99 | Discharge: very high
Time from: 8:00 to: 16:00 | Trap performance:

Perfomance comment: Trap is not operational - high water. Water level is dropping.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
0	0	0	0	0

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	0	0
	>100m	0	X	0	0
	Combined	0	X	0	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 0 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 33 | Date from: 19-Jun-99 to: 20-Jun-99 | Discharge: high
Time from: 21:00 to: 7:00 | Trap performance: fair

Perfomance comment: Trap is back in operation, but the top panel is removed again. High debris accumulation.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
32	4	1	3	106

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	7	X	95	7
	>100m	16	X	94	15
	Combined	23	X	95	22
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	95	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 9 including 6 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 34 | Date from: 20-Jun-99 to: 21-Jun-99 | Discharge: moderate
Time from: 8:00 to: 7:00 | Trap performance: very good

Perfomance comment: Top panel on left bank is re-inserted. Debris accumulation is high.

Species Summary

Coho	82	RB/ST	10	DV	0	PL	0	Salmonid fry	377
Chinook	0	CT	0	MW	0	LSU	0		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	23	X	95	22
	>100m	32	X	94	30
	Combined	55	X	95	52
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	95	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 27 including 17 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 35 | Date from: 21-Jun-99 to: 22-Jun-99 | Discharge: moderate
Time from: 8:00 to: 7:59 | Trap performance: excellent

Perfomance comment: Debris accumulation is light. Scouring is light.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
53	15	0	3	281

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	26	X	95	25
	>100m	19	X	94	18
	Combined	45	X	95	43
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	95	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 8 including 7 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 36 | Date from: 22-Jun-99 to: 23-Jun-99 | Discharge: moderate
Time from: 9:00 to: 6:50 | Trap performance: excellent

Perfomance comment: Light debris accumulation. Moderate scouring.

Species Summary

Coho	29	RB/ST	15	DV	1	PL	4	Salmonid fry	332
Chinook	0	CT	2	MW	0	LSU	1		

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	11	X	95	10
	>100m	16	X	94	15
	Combined	27	X	94	25
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 2 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 37 | Date from: 23-Jun-99 to: 24-Jun-99 | Discharge: moderate
Time from: 9:00 to: 7:59 | Trap performance: excellent

Perfomance comment: Debris accumulation is light. Scouring is light. Panels are out during the day.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
17	14	0	2	247

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	6	X	95	6
	>100m	9	X	94	8
	Combined	15	X	94	14
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	94	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 2 including 0 mortalities)

Toboggan Creek Smolt Enumeration 1999

Day 38 | Date from: 24-Jun-99 to: 25-Jun-99 | Discharge: moderate
Time from: 8:30 to: 8:15 | Trap performance: excellent

Perfomance comment: Debris accumulation is light. Panels are out during the day. Last day of fishing.

Species Summary

Coho	RB/ST	DV	PL	Salmonid fry
13	18	0	0	

Chinook	CT	MW	LSU
0	0	0	0

Coho Summary

				CWT % Retention	Estimated number with 24hr. retention
Coho CWT'ed and released immediately	<100m	5	X	95	5
	>100m	6	X	94	6
	Combined	11	X	95	11
Coho with overnight retention of CWT	<100m	0			0
	>100m	0			0
	Combined	0			0
Coho re-tagged and released immediately	<100m	0	X	95	0
	>100m	0	X	94	0
	Combined	0	X	95	0
Estimated Release of Coho with 24 hour retention of CWT	**<100mm**				**0**
	>100mm				**0**
	Combined				**0**

Coho Smolts not tagged: 2 including 1 mortalities)

Appendix 2. Individual fish data for the Toboggan Creek coho smolt enumeration project, 1999

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
1	C0	61	2.8	33954	11		
1	C0	65	3.5	33954	15		
1	C0	69	3.9	33954	18		
1	C0	69	3.9	33954	16		
1	C0	69	3.6	33954	2		
1	C0	72	4.3	33954	5	08/03/16	
1	C0	75	4.5	33954	12	08/03/16	
1	C0	76	4.9	33954	24	08/03/16	
1	C0	76	5.2	33954	14	08/03/16	
1	C0	78	4.7	33954	4	08/03/16	
1	C0	82	6.4	33954	17	08/03/16	
1	C0	86	7	33954	3	08/03/16	
1	C0	87	7.7	33954	21	08/03/16	
1	C0	87	7.9	33954	19	08/03/16	
1	C0	88	7.1	33954	1	08/03/16	
1	C0	89	6.3	33954	20	08/03/16	
1	C0	89	7.4	33954	6	08/03/16	
1	C0	90	8.6	33954	10	08/03/16	
1	C0	91	8.1	33954	23	08/03/16	
1	C0	91	8.3	33954	9	08/03/16	
1	C0	92	8.4	33954	13	08/03/16	
1	C0	93	8.7	33954	8	08/03/16	
1	C0	95	9.3	33954	7	08/03/16	
1	C0	98	10	33954	22	08/03/16	
2	C0	62	2.4	33954	25		
2	C0	90	7.6	33954	26	08/03/16	
2	C0	103	10	33954	27	08/03/21	
2	C0	119	16	33954	28	08/03/21	
2	C0	122	18.1	33954	29	08/03/21	
2	DV	75	3.5				
2	RB/ST	101	11.3				
3	C0	72	4.1	33954	30	08/03/16	Either this coho or 74mm coho escaped from bucket through hose
3	C0	74	4.7	33954	31	08/03/16	Either this coho or 72mm coho escaped from bucket through hose
3	C0	122	18.6	33954	32	08/03/21	
3	RB/ST	57	1.6				
4	C0	114	17.8	33954	41	08/03/21	
4	C0	116	16	33954	42	08/03/21	
4	C0	117	16.7	33954	43	08/03/21	
4	C0	123	17.8	33954	45	08/03/21	
4	C0	128	21	33954	40	08/03/21	
4	C0	129	19.6	33954	44	08/03/21	
4	C0	132	22.4	33954	46	08/03/21	
4	C0	134	36.6	33954	47	08/03/21	
4	CO	82	6.9	33954	33	08/03/16	
4	CO	87	6.7	33954	34	08/03/16	
4	CO	99	10.1	33954	35	08/03/16	
4	CO	110	13.9	33954	36	08/03/21	
4	CO	112	14.2	33954	38	08/03/21	
4	CO	117	15.5	33954	37	08/03/21	
4	CO	121	16.7	33954	39	08/03/21	
4	DV	74	4				
4	LSU						
4	RB/ST	61	2.1				
4	RB/ST	61	2.2				
4	RB/ST	69	3.2				

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
4	RB/ST	86	6.9	33954			
5	C0	93	9			08/03/16	sample 7 omitted
5	C0	106	11.5			08/03/21	
5	C0	106	12.7			08/03/21	
5	C0	107	11.1			08/03/21	
5	C0	108	12.9			08/03/21	
5	C0	108	13.6			08/03/21	
5	C0	108	14.9	33955	33		extensive scale loss, not tagged
5	C0	112	14.6				scale loss, not tagged
5	C0	112	14.8			08/03/21	
5	C0	112	14			08/03/21	
5	C0	112	13	33955	30		scale loss, not tagged
5	C0	112	14.3			08/03/21	
5	C0	112	13.9			08/03/21	
5	C0	112	14.7			08/03/21	
5	C0	112	13.1	33955	32		scale loss, not tagged
5	C0	113	14.2			08/03/21	
5	C0	113	14				lower lobe of caudal fin torn off, not tagged
5	C0	113	13.6				upper caudal torn, not tagged
5	C0	113	15.1			08/03/21	
5	C0	114	14.9			08/03/21	
5	C0	114	16.5			08/03/21	
5	C0	114	15.2			08/03/21	
5	C0	114	13.8	33955	29	08/03/21	
5	C0	115	15.4			08/03/21	
5	C0	116	15.3			08/03/21	
5	C0	116	15.3			08/03/21	
5	C0	117	15.6	33955	28	08/03/21	
5	C0	117	16.7			08/03/21	
5	C0	117	16.6			08/03/21	
5	C0	117	15			08/03/21	
5	C0	117	15.3	33955	41	08/03/21	
5	C0	117	15.4	33955	48	08/03/21	
5	C0	118	17			08/03/21	
5	C0	118	15			08/03/21	
5	C0	118	16.2	51351	4	08/03/21	
5	C0	118	15.8	51351	1	08/03/21	
5	C0	118	15.2			08/03/21	
5	C0	118	15.5			08/03/21	
5	C0	118	15.8	33955	40	08/03/21	
5	C0	119	16.6	33955	39	08/03/21	
5	C0	119	16.5			08/03/21	
5	C0	119	15.9			08/03/21	
5	C0	120	16.4			08/03/21	
5	C0	121	19.2	33955	49	08/03/21	
5	C0	121	18	51351	3	08/03/21	
5	C0	122	16.8	33955	47	08/03/21	
5	C0	122	18.6			08/03/21	
5	C0	122	17.8			08/03/21	
5	C0	122	18.3			08/03/21	
5	C0	122	16.4				scale loss on caudal peduncle, not tagged
5	C0	123	18.3	33955	45	08/03/21	
5	C0	123	15.6	33955	31	08/03/21	
5	C0	123	12.5			08/03/21	
5	C0	123	20.9			08/03/21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
5	C0	123	17.1	33955	36	08/03/21	
5	C0	123	18.6			08/03/21	
5	C0	124	19.4			08/03/21	
5	C0	124	20.1	33955	46	08/03/21	
5	C0	124	19.4	33955	34	08/03/21	
5	C0	126	18.7			08/03/21	
5	C0	127	19.8			08/03/21	
5	C0	127	19.2			08/03/21	
5	C0	127	20.5	33955	38	08/03/21	
5	C0	127	22.7	33955	44	08/03/21	
5	C0	128	20.3	33955	42	08/03/21	
5	C0	128	21.8	33955	37	08/03/21	
5	C0	128	20.3			08/03/21	
5	C0	128	21.8			08/03/21	
5	C0	128	19.5			08/03/21	
5	C0	128	21.6			08/03/21	
5	C0	129	20.9	51351	2	08/03/21	
5	C0	132	21	51351	10		scale loss, not tagged
5	C0	132	20.1	51351	11	08/03/21	
5	C0	137	24.5			08/03/21	
5	C0	138	25.1	33955	35		scale loss, not tagged
5	C0	139	25.7	33955	50	08/03/21	
5	C0	142	27.9	51351	6	08/03/21	
5	C0	154	18.3	33955	43	08/03/21	
5	C0	154	34.3	51351	5	08/03/21	
5	C0	154	35.9	51351	8	08/03/21	
5	C0	160	40	51351	9		scale loss, not tagged
5	CO	55	2.5	33955	1		
5	CO	66	3.4	33955	5		
5	CO	67	3.2	33954	48		missing left eye, not tagged
5	CO	67	3.1	33955	2		
5	CO	72	5.6	33954	49	08/03/16	
5	CO	73	4.3	33955	3	08/03/16	
5	CO	74	5.3	33954	50	08/03/16	
5	CO	75	4.6	33955	4	08/03/16	
5	CO	81	5.8	33955	6	08/03/16	
5	CO	82	6	33955	7	08/03/16	
5	CO	93	8.8	33955	18	08/03/16	
5	CO	93	8	33955	8	08/03/16	
5	CO	97	9.2	33955	10	08/03/16	
5	CO	97	9			08/03/16	
5	CO	97	8.4	33955	9		scale loss, not tagged
5	CO	98	8.4	33955	13	08/03/16	
5	CO	99	12.2	33955	16	08/03/16	
5	CO	100	9.5	33955	14	08/03/16	
5	CO	102	12.1			08/03/21	
5	CO	104	11.8			08/03/21	
5	CO	104	11.7	33955	11	08/03/21	
5	CO	104	12.9	33955	20	08/03/21	
5	CO	104	13	33955	22		bruise on head, not tagged
5	CO	104	13.3	33955	17	08/03/21	
5	CO	106	11.4	33955	21	08/03/21	
5	CO	107	12.9	33955	19	08/03/21	
5	CO	107	12.9	33955	12		scale loss, not tagged
5	CO	107	12.6			08/03/21	
5	CO	107	11.7			08/03/21	
5	CO	108	12.2	33955	15	08/03/21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
5	CO	112	14.6	33955	25	08/03/21	
5	CO	114	15.2	33955	24	08/03/21	
5	CO	114	14.5	33955	23	08/03/21	
5	CO	116	15.4	33955	26		scale loss, not tagged
5	CO	117	15.4	33955	27	08/03/21	
5	DV	88	7				
5	DV	88	7				
5	RB/ST	51	1.4				mort
5	RB/ST	102	11.8				
5	RB/ST	102	11.4				
6	DV						
8	C0	44	0.8	51352	1		Captured in gee trap
8	C0	48	1.1				Captured in gee trap
8	C0	50	1.4			16	Captured in gee trap
8	C0	62	2.8	51351	15		G trapped and lower caudal clip
8	C0	63	2.6				Captured in gee trap
8	C0	64	3	51351	12		G trapped and lower caudal clip
8	C0	64	3.2	51351	14		G trapped and lower caudal clip
8	C0	64	2.9	51351	17		G trapped and lower caudal clip
8	C0	66	3.5	51351	13		G trapped and lower caudal clip
8	C0	69	3.8	51351	16		G trapped and lower caudal clip
8	C0	75	4.8	51351	19	16	G trapped and lower caudal clip
8	C0	77	5.4	51351	30	16	G trapped and lower caudal clip
8	C0	77	5.1	51351	20	16	G trapped and lower caudal clip
8	C0	77	5.3	51351	18	16	G trapped and lower caudal clip
8	C0	81	6.1	51351	23	16	G trapped and lower caudal clip
8	C0	81	6.3	51351	24	16	G trapped and lower caudal clip
8	C0	82	6	51351	21	16	G trapped and lower caudal clip
8	C0	82	6.3	51351	25	16	G trapped and lower caudal clip
8	C0	85	6.8	51351	27	16	Void scale sample. G trapped and lower caudal clip
8	C0	86	7.1	51351	22	16	G trapped and lower caudal clip
8	C0	87	7.8	51351	28	16	G trapped and lower caudal clip
8	C0	87	7.4	51351	26	16	Void scale sample. G trapped and lower caudal clip
8	C0	90	9.1	51352	4	16	Captured in gee trap
8	C0	90	9	51351	31	16	G trapped and lower caudal clip
8	C0	91	7.7	51351	33	16	G trapped and lower caudal clip
8	C0	91	8.2	51351	42	21	G trapped and lower caudal clip
8	C0	93	7.7			16	Captured in gee trap
8	C0	93	8.8	51351	34	16	G trapped and lower caudal clip
8	C0	95	9.4	51351	29	16	G trapped and lower caudal clip
8	C0	96	11.1	51351	43	21	G trapped and lower caudal clip
8	C0	97	9.6	51352	2	16	Captured in gee trap
8	C0	98	10.3	51351	32	16	G trapped and lower caudal clip
8	C0	99	10.6	51351	41	16	G trapped and lower caudal clip
8	C0	100	10.2	51351	35	16	G trapped and lower caudal clip
8	C0	100	10.3			16	Captured in gee trap
8	C0	101	12.9	51351	44	21	G trapped and lower caudal clip
8	C0	102	11.6	51351	38	21	G trapped and lower caudal clip
8	C0	102	10.9			21	Captured in gee trap
8	C0	103	11.1	51352	3	gged with <100	Captured in gee trap
8	C0	103	12.4	51351	36	21	G trapped and lower caudal clip
8	C0	103	11.1			21	G trapped and lower caudal clip
8	C0	104	10.6			21	Captured in gee trap
8	C0	105	13.5	51351	39	21	G trapped and lower caudal clip

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
8	C0	105	12.2	51351	40	21	G trapped and lower caudal clip
8	C0	105	11.5			21	Captured in gee trap
8	C0	108	13.5	51351	37	21	G trapped and lower caudal clip
8	C0	110	13.3	51352	11	21	Captured in gee trap
8	C0	110	13.9	51352	8	21	Captured in gee trap
8	C0	111	14.6			21	Captured in gee trap
8	C0	111	14.3	51352	9	21	Captured in gee trap
8	C0	112	14.8			21	Captured in gee trap
8	C0	112	12.9	51352	5	21	Captured in gee trap
8	C0	112	14.9	51351	46	21	G trapped and lower caudal clip
8	C0	112	14.9	51351	45	21	G trapped and lower caudal clip
8	C0	115	15.6	51352	7	21	Captured in gee trap
8	C0	117	16.6	51351	47	21	G trapped and lower caudal clip
8	C0	118	17.6			21	Captured in gee trap
8	C0	118	16.7	51351	48	21	G trapped and lower caudal clip
8	C0	118	15.8			21	Captured in gee trap
8	C0	118	17.1	51352	13	21	Captured in gee trap
8	C0	118	16.1	51352	10	21	Captured in gee trap
8	C0	118	15.6	51352	6	21	Captured in gee trap
8	C0	119	15.8			21	Captured in gee trap
8	C0	119	18.9	51351	49	21	G trapped and lower caudal clip
8	C0	120	17.6			21	Captured in gee trap
8	C0	120	16			21	Captured in gee trap
8	C0	120	16			21	Captured in gee trap
8	C0	120	17			21	Captured in gee trap
8	C0	120	20.9	51351	50	21	G trapped and lower caudal clip
8	C0	121	18.3	51352	12	21	Captured in gee trap
8	C0	122	17.6	51352	22	21	Captured in gee trap
8	C0	122	19.1			21	Captured in gee trap
8	C0	123	18.2			21	Captured in gee trap
8	C0	123	19.6	51352	24	21	Captured in gee trap
8	C0	124	18.2	51352	17	21	Captured in gee trap
8	C0	124	18.9			21	Captured in gee trap
8	C0	125	21.2	51352	14	21	Captured in gee trap
8	C0	125	19.5			21	Captured in gee trap
8	C0	126	18.8	51352	19	21	Captured in gee trap
8	C0	126	18.9	51352	15	21	Captured in gee trap
8	C0	126	19.4			21	Captured in gee trap
8	C0	126	19.3				Severe scale loss, not tagged
8	C0	128	21			21	Captured in gee trap
8	C0	128	20.4	51352	21	21	Captured in gee trap
8	C0	129	21.6			21	Captured in gee trap
8	C0	129	20.3	51352	23	21	Captured in gee trap
8	C0	130	21			21	Captured in gee trap
8	C0	130	21.4	51352	16	21	Captured in gee trap
8	C0	133	22.6	51352	25	21	Captured in gee trap
8	C0	133	24.2	51352	20	21	Captured in gee trap
8	C0	136	26.7	51352	18	21	Captured in gee trap
8	C0	205	66.5			21	Captured in gee trap
8	DV	70	3.1				Captured in gee trap
8	DV	80	5.3				Captured in gee trap
8	DV	81	5				Captured in gee trap
8	DV	82	5.4				Captured in gee trap
8	DV	98	10				Captured in gee trap
8	DV	105	12				Captured in gee trap

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
8	DV	110	14.9				Captured in gee trap
8	DV	114	15.4				Captured in gee trap
8	DV	115	16.4				Captured in gee trap
8	DV	116	14.9				Captured in gee trap
8	DV	117	15.6				Captured in gee trap
8	DV	121	19.6				Captured in gee trap
8	DV	128	22.8				Captured in gee trap. Bruising and scale loss.
8	DV	133	24.9				Captured in gee trap
8	DV	149	41.3				Captured in gee trap
8	MW	139	23.8				Captured in gee trap
8	RB/ST	51	2.4				Captured in gee trap
8	RB/ST	63	2.4				Captured in gee trap
8	RB/ST	92	8.7				Captured in gee trap
8	RB/ST	94	10				Captured in gee trap
8	RB/ST	97	10.2				Captured in gee trap
8	RB/ST	98	11.2				Captured in gee trap
8	RB/ST	105	13.6				Captured in gee trap
8	RB/ST	106	13.3				Captured in gee trap
8	RB/ST	110	15.2				Captured in gee trap
8	RB/ST	143	31.9				Captured in gee trap
8	RB/ST	146	28.6				Captured in gee trap
9	C0	65	3.2				Caudal clip, not tagged
9	C0	71	3.8	51352	41	16	
9	C0	78	4.9	51352	43	16	
9	C0	84	6.5	51352	42	16	
9	C0	86	6.6			16	Caudal clip
9	C0	86	6.7	51352	40	16	Not part of random sample
9	C0	88	6.7	51352	39	16	Not part of random sample
9	C0	90	7	51352	37	16	Not part of random sample
9	C0	93	8.7	51352	38	16	Not part of random sample
9	C0	95	9.5	51352	36	16	Not part of random sample
9	C0	97	9			16	Caudal clip
9	C0	98	9.3			16	Caudal clip
9	C0	98	9.7			16	Caudal clip
9	C0	99	10			16	Caudal clip
9	C0	100	10.3			16	Caudal clip
9	C0	100	10.3			16	Caudal clip
9	C0	100	10.1			16	Caudal clip
9	C0	101	10.5			21	
9	C0	105	11.8			21	
9	C0	106	12	51352	26	21	
9	C0	107	12.4			21	
9	C0	108	13.9			21	
9	C0	109	13.4			21	
9	C0	110	14.5			21	
9	C0	110	12.6	51352	27	21	
9	C0	110	13.9			21	
9	C0	110	12.4			21	
9	C0	111	13.9			21	
9	C0	112	14.2			21	
9	C0	112	12.9			21	
9	C0	113	15			21	
9	C0	113	13.7			21	
9	C0	115	14.8			21	
9	C0	115	14.5			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
9	C0	115	16.1			21	
9	C0	115	15.1			21	
9	C0	116	14.8			21	
9	C0	118	16.1			21	
9	C0	119	16.8			21	
9	C0	119	17			21	
9	C0	119	16.3			21	
9	C0	119	16			21	
9	C0	120	16.9			21	
9	C0	120	17			21	
9	C0	120	17.6			21	
9	C0	120	15			21	
9	C0	120	15.9			21	
9	C0	120	16.6			21	
9	C0	121	16.1			21	
9	C0	121	17.5			21	
9	C0	122	15.8			21	
9	C0	122	17.5			21	
9	C0	122	18			21	Not part of random sample
9	C0	122	17.1			21	
9	C0	122	18.1			21	
9	C0	124	18.2			21	
9	C0	124	17.3				Scale loss by right dorsal, not tagged
9	C0	125	19			21	
9	C0	125	18.1			21	
9	C0	125	19.9			21	
9	C0	126	19.5			21	
9	C0	126	19.1			21	Not part of random sample
9	C0	126	19.4			21	
9	C0	127	20			21	
9	C0	128	20			21	
9	C0	130	22			21	
9	C0	130	22.2			21	Not part of random sample
9	C0	131	22.5	51352	28	21	
9	C0	132	24.1	51352	34	21	Not part of random sample
9	C0	135	23.9	51352	35	21	Not part of random sample
9	C0	137	24.2	51352	29	21	
9	C0	137	22.3	51352	30	21	
9	C0	139	25.7	51352	31	21	
9	C0	151	34.3	51352	33	21	Not part of random sample
9	C0	165	49	51352	32	21	
9	DV	70	3.2				
9	RB/ST	53	1.6				
9	RB/ST	56	1.7				
9	RB/ST	110	16.7				Not part of random sample
9	RB/ST	152	39.9				Not part of random sample
10	C0						25<100 and 100>100 were released upstream with a lower caudal clip and adipose clip
10	C0	46	0.9				not tagged, caudal clip
10	C0	76	4.5	51352	48	16	caudal clip
10	C0	85	6.5	51352	49	16	caudal clip
10	C0	87	7.4	51352	50	16	caudal clip
10	C0	91	9.3	51352	44	16	caudal clip
10	C0	92	7.9			16	caudal clip
10	C0	93	8.4			16	caudal clip
10	C0	94	7.9			16	caudal clip

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
10	C0	100	10.3			16	caudal clip
10	C0	101	10.6			21	
10	C0	101	10.9			21	
10	C0	101	7.9			21	
10	C0	103	10.8			21	
10	C0	103	10.1			21	
10	C0	104	12.5			21	
10	C0	105	11.4			21	
10	C0	105	11.3			21	
10	C0	107	11.5			21	
10	C0	107	13			21	
10	C0	110	15			21	
10	C0	110	14.1			21	
10	C0	110	13.2			21	
10	C0	111	13.7				abdominal puncture, not tagged
10	C0	111	14.3			21	
10	C0	111	13.2			21	
10	C0	111	14.1			21	
10	C0	112	12.9			21	
10	C0	113	14.2			21	
10	C0	114	14.8			21	
10	C0	114	14.5			21	
10	C0	115	14.9			21	
10	C0	115	17.3			21	
10	C0	115	17.6			21	
10	C0	115	15			21	
10	C0	116	15.5			21	
10	C0	117	16.3				scale loss on left side, not tagged
10	C0	117	15.8			21	
10	C0	118	16.3			21	
10	C0	119	16.3			21	
10	C0	119	16.1			21	
10	C0	120	17.1			21	
10	C0	120	18.6			21	
10	C0	120	16.9			21	
10	C0	120	16.1			21	
10	C0	121	17.5			21	
10	C0	121	17.9			21	
10	C0	121	17.2			21	
10	C0	122	18.2			21	
10	C0	124	18.2			21	
10	C0	126	20.4			21	
10	C0	128	20.3			21	
10	C0	135	22.9	51352	45	21	
10	C0	135	24.8	51352	46	21	
10	C0	135	26.7	51352	47	21	
10	C0	139	26.5	51353	1	21	
10	CT	157	34.6				
10	DV	139	25.2				R 11 L 12 (Br. Rays)
10	LSU						
10	RB/ST	63	2.6				
10	RB/ST	91	9.1				
11	C0						30<100 were released upstream with a lower caudal clip and adipose clip
11	C0	71	3.8	51353	2	16	caudal clip
11	C0	76	4.4	51353	7	16	not part of random sample
11	C0	83	6.5			16	caudal clip

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
11	C0	98	8.6			16	caudal clip
11	C0	102	11.1			21	
11	C0	103	11.4			21	
11	C0	103	10.6			21	
11	C0	105	11.8			21	
11	C0	106	12.8			21	
11	C0	106	12.7			21	
11	C0	106	11.5			21	
11	C0	107	12.5			21	
11	C0	108	12.5			21	
11	C0	109	13.5			21	
11	C0	109	12.6			21	
11	C0	110	14			21	
11	C0	112	13.3			21	
11	C0	112	18.8			21	
11	C0	113	13.8			21	
11	C0	113	13.8			21	
11	C0	113	12.8			21	
11	C0	114	13.8			21	
11	C0	114	14.8			21	
11	C0	114	15			21	
11	C0	114	15.8			21	
11	C0	114	14.3			21	
11	C0	115	18.2			21	
11	C0	115	12.4			21	
11	C0	116	15.4			21	
11	C0	116	15.4			21	
11	C0	116	14.7			21	
11	C0	116	15.3			21	
11	C0	117	16.2			21	
11	C0	117	16.2			21	
11	C0	117	14.5			21	
11	C0	117	15.4			21	
11	C0	118	16.7			21	
11	C0	119	16.4			21	
11	C0	120	19.2			21	
11	C0	121	17			21	
11	C0	122	18.2			21	
11	C0	122	18			21	
11	C0	123	18			21	
11	C0	125	18.7			21	
11	C0	126	19			21	
11	C0	126	20.2			21	
11	C0	126	20.6			21	
11	C0	126	19.1			21	
11	C0	127	20.3			21	
11	C0	130	21.8			21	
11	C0	130	20.1			21	
11	C0	130	22.3			21	
11	C0	140	26.7	51353	5	21	not part of random sample
11	C0	143	29.3	51353	3	21	
11	C0	147	34	51353	4	21	not part of random sample
11	C0	152	36.4	51353	6	21	not part of random sample
11	CT	110	12.4				
11	DV	154	34				R 11 L 12 (Br. Rays)
11	DV	195	78.7				R 10 L 11 (Br. Rays)

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
12	C0						4<100 were released upstream with a lower caudal clip and adipose clip
12	C0	89	7.9			16	lower caudal clip
12	C0	90	8.2			16	lower caudal clip
12	C0	95	9.4			16	lower caudal clip
12	C0	96	9.2			16	lower caudal clip
12	C0	101	11.6			21	
12	C0	103	10.9			21	
12	C0	103	10.9			21	
12	C0	103	12.2			21	
12	C0	105	11.6			21	
12	C0	107	12.2			21	
12	C0	107	12.9			21	
12	C0	108	12.1			21	
12	C0	108	14			21	
12	C0	108	12.5				scale loss, ripped upper caudal, not tagged
12	C0	109	13.7			21	
12	C0	109	13.9			21	
12	C0	110	14.1			21	
12	C0	110	13.1			21	
12	C0	110	13			21	
12	C0	110	13.5			21	
12	C0	110	14			21	
12	C0	111	14.8			21	
12	C0	112	14.4			21	
12	C0	112	13.9			21	
12	C0	113	14.9			21	
12	C0	113	16.1			21	
12	C0	114	13.8			21	
12	C0	114	15.2			21	
12	C0	114	15.5			21	
12	C0	114	15.1			21	
12	C0	115	14.7			21	
12	C0	115	16.2			21	
12	C0	115	15.8			21	
12	C0	115	15.9			21	
12	C0	115	15.3			21	
12	C0	117	16.2			21	
12	C0	117	16.3			21	
12	C0	118	15.4			21	
12	C0	118	17.1			21	
12	C0	119	16.3			21	
12	C0	119	16.8			21	
12	C0	119	15.7			21	
12	C0	119	16.6			21	
12	C0	119	16.8			21	
12	C0	119	18.2			21	
12	C0	120	15			21	
12	C0	120	18.2			21	
12	C0	121	17.3			21	
12	C0	123	18			21	
12	C0	123	18.2			21	
12	C0	123	18.7			21	
12	C0	124	19.6			21	
12	C0	125	18.6			21	
12	C0	125	19.3			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
12	C0	125	19.8			21	
12	C0	126	21.9			21	
12	C0	126	20.9			21	
12	C0	127	19.8			21	
12	C0	128	21.3			21	
12	C0	128	20.7				wound on left caudal peduncle, not tagged
12	C0	130	22.5			21	
12	C0	131	22.4				abdominal wound, not tagged
12	C0	131	22.7			21	
12	C0	136	27.4	51353	9	21	
12	C0	142	27.8	51353	8	21	
12	DV	97	8.6				
12	DV	106	12.5				
12	RB/ST	57	1.7				
12	RB/ST	60	3				
13	C0						17<100 were released upstream with a lower caudal clip and adipose clip
13	C0	64	2.8	51353	16		not part of random sample, not tagged
13	C0	78	5	51353	18	16	not part of random sample
13	C0	79	5	51353	17	16	not part of random sample
13	C0	97	10.4			16	lower caudal clip
13	C0	98	9.8			16	lower caudal clip
13	C0	100	10.5			16	lower caudal clip
13	C0	100	10.6			16	lower caudal clip
13	C0	103	11.1			21	
13	C0	103	11.4			21	
13	C0	104	11.4			21	
13	C0	104	11.2			21	
13	C0	107	12.5			21	
13	C0	108	12.5			21	
13	C0	109	12			21	
13	C0	109	12.6			21	
13	C0	110	13.3			21	
13	C0	111	13.5			21	
13	C0	111	13.8			21	
13	C0	112	14.5			21	
13	C0	113	14.8			21	
13	C0	113	14.1			21	
13	C0	113	14.8			21	
13	C0	114	13.5			21	
13	C0	114	15.6			21	
13	C0	114	15.3			21	
13	C0	114	12.5			21	
13	C0	115	15.6			21	
13	C0	115	15.7			21	
13	C0	115	14.6			21	
13	C0	116	15.8			21	
13	C0	117	15.1			21	
13	C0	117	15.6			21	
13	C0	117	16.1			21	
13	C0	117	17.3			21	
13	C0	117	15.7			21	
13	C0	117	15.8			21	
13	C0	118	15.7			21	
13	C0	118	15.3			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
13	CO	119	16.2			21	
13	CO	119	16.7			21	
13	CO	119	16.7				scale loss, not tagged
13	CO	120	17.8			21	
13	CO	120	16.9			21	
13	CO	120	17.1			21	
13	CO	121	17.7			21	
13	CO	121	17.6			21	
13	CO	121	20.3			21	
13	CO	122	18			21	
13	CO	126	19				not part of random sample, cut on gill, not tagged
13	CO	126	20.2			21	not part of random sample
13	CO	129	20.6			21	
13	CO	130	22.1				scale loss, not tagged
13	CO	133	24.4			21	not part of random sample
13	CO	133	24.2			21	
13	CO	133	24.8			21	
13	CO	137	28.9			21	
13	CO	139	29.4			21	
13	CO	146	32.5	51353	14	21	not part of random sample
13	CO	147	30.1	51353	15	21	not part of random sample
13	CO	151	35.2	51353	11	21	
13	CO	152	35.3	51353	12	21	
13	CO	152	36	51353	13	21	not part of random sample
13	CO	153	36.7	51353	10	21	
13	RB/ST	101	11.8				
14	CO						24<100 were released upstream with a lower caudal clip and adipose clip
14	CO	74	3.8	51353	26	16	not part of random sample
14	CO	93	7.6			16	
14	CO	95	9.8			16	
14	CO	99	10			16	
14	CO	99	9.4			16	
14	CO	99	9.5			16	
14	CO	100	9.8			16	
14	CO	101	10.1			21	
14	CO	102	10.6			21	
14	CO	102	10.5			21	
14	CO	102	10.1			21	
14	CO	103	11.1			21	
14	CO	103	11.7			21	
14	CO	104	11.3			21	
14	CO	104	10.9			21	
14	CO	104	11.7			21	
14	CO	104	12.2			21	
14	CO	104	11.4			21	
14	CO	105	11.5			21	
14	CO	105	11.7			21	
14	CO	105	12			21	
14	CO	106	11.4			21	
14	CO	107	12.1			21	
14	CO	107	12.3			21	
14	CO	107	12.3			21	
14	CO	108	13.3			21	
14	CO	109	15.3			21	
14	CO	109	13.6			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
14	C0	109	12.4			21	
14	C0	110	14.4			21	
14	C0	110	14.4			21	
14	C0	110	12.8			21	
14	C0	111	13.8			21	
14	C0	112	14.1			21	
14	C0	112	15.7			21	
14	C0	112	15.6			21	
14	C0	112	16.2			21	
14	C0	113	14.2			21	
14	C0	114	15			21	
14	C0	114	14.5			21	
14	C0	114	15			21	
14	C0	115	15.3			21	
14	C0	115	16.2			21	
14	C0	116	17			21	
14	C0	118	17.5			21	
14	C0	118	18.4			21	
14	C0	118	16.3			21	
14	C0	119	17.5			21	
14	C0	120	16.2			21	
14	C0	120	16.8			21	
14	C0	121	21.4			21	
14	C0	123	19.6			21	
14	C0	123	18.5			21	
14	C0	124	19.1			21	
14	C0	124	19.6			21	
14	C0	125	17.4			21	
14	C0	129				21	split caudal
14	C0	129	22.8			21	
14	C0	129	24.5			21	
14	C0	135	23.7			21	
14	C0	137	25			21	
14	C0	141	30.2	51353	19	21	
14	C0	143	31.5	51353	25	21	not part of random sample
14	C0	143	27.5	51353	23	21	not part of random sample
14	C0	143	30.8	51353	21	21	not part of random sample
14	C0	144	32	51353	22	21	not part of random sample
14	C0	148	36.7	51353	24	21	not part of random sample
14	C0	149	34.5	51353	20	21	not part of random sample
14	DV	95	7.4				
14	DV	96	9				
14	DV	111	12.2				
14	DV	124	18.1				22 Br. Rays
14	DV	166	50.1				
14	RB/ST	105	12.9				
14	RB/ST	117	21.9				
14	RB/ST	119	20.8				
15	C0	65	2.8	51353	31		not part of random sample, upper caudal clipped, not tagged
15	C0	80	5.2	51353	30	16	not part of random sample, upper caudal clipped
15	C0	83	6			16	upper caudal clipped
15	C0	94	8.9			16	upper caudal clipped
15	C0	98	9.3			16	upper caudal clipped
15	C0	98	9.3			16	upper caudal clipped

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
15	C0	98	9.1			16	part of random sample, upper caudal clipped
15	C0	99	9.6			16	upper caudal clipped
15	C0	99	9			16	part of random sample, upper caudal clipped
15	C0	101	10.3			21	upper caudal clipped
15	C0	102	10.6			21	upper caudal clipped
15	C0	103	11.2			21	upper caudal clipped
15	C0	105	10.8			21	upper caudal clipped
15	C0	106	11.4			21	upper caudal clipped
15	C0	106	12			21	upper caudal clipped
15	C0	106	12.1			21	upper caudal clipped
15	C0	107	11.7			21	upper caudal clipped
15	C0	107	12.6			21	upper caudal clipped
15	C0	107	11.9			21	upper caudal clipped
15	C0	108	11.9			21	upper caudal clipped
15	C0	108	12.1			21	upper caudal clipped
15	C0	109	13.1			21	upper caudal clipped
15	C0	109	12.5			21	upper caudal clipped
15	C0	110	13.1			21	upper caudal clipped
15	C0	110	13.6			21	upper caudal clipped
15	C0	110	13.5			21	upper caudal clipped
15	C0	110	13.6			21	upper caudal clipped
15	C0	111	13.3			21	upper caudal clipped
15	C0	112	13.9			21	upper caudal clipped
15	C0	112	14.3			21	upper caudal clipped
15	C0	112	14.4			21	upper caudal clipped
15	C0	112	13.2			21	upper caudal clipped
15	C0	112	12.7			21	upper caudal clipped
15	C0	112	13.8			21	upper caudal clipped
15	C0	113	14.3			21	upper caudal clipped
15	C0	113	13.7			21	upper caudal clipped
15	C0	113	13.1			21	upper caudal clipped
15	C0	114	14.4			21	upper caudal clipped
15	C0	115	16.2			21	upper caudal clipped
15	C0	115	14.9			21	upper caudal clipped
15	C0	115	15.1			21	upper caudal clipped
15	C0	115	14.5			21	upper caudal clipped
15	C0	116	16.3			21	upper caudal clipped
15	C0	116	15.7			21	upper caudal clipped
15	C0	117	15.3			21	upper caudal clipped
15	C0	117	15.7			21	upper caudal clipped
15	C0	117	14.4			21	upper caudal clipped
15	C0	118	14.9			21	upper caudal clipped
15	C0	118	15.8			21	upper caudal clipped
15	C0	118	15.6			21	upper caudal clipped
15	C0	119	17			21	upper caudal clipped
15	C0	119	16.2			21	upper caudal clipped
15	C0	119	16.4			21	upper caudal clipped
15	C0	120	15.9			21	upper caudal clipped
15	C0	120	15.6			21	upper caudal clipped
15	C0	121	18			21	upper caudal clipped
15	C0	121	17.8			21	upper caudal clipped
15	C0	122	17			21	upper caudal clipped
15	C0	124	18.3			21	upper caudal clipped
15	C0	127	20.3			21	upper caudal clipped

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
15	C0	129	21.8			21	upper caudal clipped
15	C0	130	19.9			21	upper caudal clipped
15	C0	138	24.6			21	upper caudal clipped
15	C0	151	34.9	51353	28	21	not part of random sample, upper caudal clipped
15	C0	159	49.5	51353	27	21	upper caudal clipped
15	C0	160	44	51353	29	21	not part of random sample, upper caudal clipped
15	CT	107	11.4				not part of random sample
15	MW	150	33.3				not part of random sample
15	MW	153	33.8				not part of random sample
15	RB/ST	61	2.1				not part of random sample
15	RB/ST	71	3.6				not part of random sample
15	RB/ST	72	3.8				not part of random sample
15	RB/ST	85	5.9				not part of random sample
15	RB/ST	120	19.2				not part of random sample
15	RB/ST	127	22.1				not part of random sample
16	C0	63	2.7	51353	34		not part of random sample, not tagged
16	C0	66	2.9	51353	33		not part of random sample, not tagged
16	C0	68	3.3	51353	35		not part of random sample, not tagged
16	C0	83	5.8			16	upper caudal clipped
16	C0	92	7.7			16	upper caudal clipped
16	C0	95	8.8			16	upper caudal clipped
16	C0	97	9.3			16	upper caudal clipped
16	C0	98	9.5			16	upper caudal clipped
16	C0	99	9.6			16	upper caudal clipped
16	C0	99	9.4			16	upper caudal clipped
16	C0	100	9.6			16	upper caudal clipped
16	C0	100	9.2			16	upper caudal clipped
16	C0	100	10.3			16	upper caudal clipped
16	C0	101	10.1			21	
16	C0	101	10.7			21	
16	C0	103	10.5			21	
16	C0	103	10.4			21	
16	C0	103	12.1			21	
16	C0	103	10.4			21	
16	C0	103	11.5			21	
16	C0	104	11.6			21	
16	C0	104	11.1			21	
16	C0	104	9.7			21	
16	C0	105	10.7			21	
16	C0	105	12			21	
16	C0	106	11.7			21	
16	C0	106	11.6			21	
16	C0	107	11.3			21	
16	C0	107	11.6			21	
16	C0	108	12.6			21	
16	C0	108	12			21	
16	C0	108	13.1			21	
16	C0	109	12.7			21	
16	C0	111	14.1			21	
16	C0	111	13.7			21	
16	C0	111	13.5			21	
16	C0	112	13.7			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
16	C0	112	13.8			21	
16	C0	112	12.7			21	
16	C0	112	13.9			21	
16	C0	113	13.8			21	
16	C0	114	15.8			21	
16	C0	114	12.6			21	
16	C0	114	13.6			21	
16	C0	115	15.3			21	
16	C0	115	14.5			21	
16	C0	115	15			21	
16	C0	116	16.4			21	
16	C0	117	16.1			21	
16	C0	117	15.6			21	
16	C0	117	15.5			21	
16	C0	119	16.3			21	
16	C0	119	15.8			21	
16	C0	121	17.8			21	
16	C0	122	19.5			21	
16	C0	122	18.8			21	
16	C0	125	18.9			21	
16	C0	130	23			21	
16	C0	153	32				not part of random sample
16	CT	58	2				not part of random sample
16	CT	66	2.7				not part of random sample
16	CT	82	5				not part of random sample
16	CT	105	14.9				not part of random sample
16	DV	72	3.8				not part of random sample
16	DV	82	5.8				not part of random sample
16	DV	114	14.7				not part of random sample
16	DV	115	15				R 11 L 11 (Br. Rays)
16	DV	139	24.6				not part of random sample
16	RB/ST	93	8.9				not part of random sample
16	RB/ST	103	11.7				not part of random sample
16	RB/ST	105	12.6				not part of random sample
16	RB/ST	107	12.2				not part of random sample
16	RB/ST	109	14.9				not part of random sample
16	RB/ST	118	17.8				not part of random sample, mort
16	RB/ST	130	25.6				not part of random sample
17	C0						100 each of <100 and >100 were released upstream with upper caudal clip and adipose clip
17	C0	70	3.6	51353	41	16	not part of random sample
17	C0	76	4.6	51353	36	16	
17	C0	78	4.9	51353	40	16	not part of random sample
17	C0	91	8			16	
17	C0	92	7.7			16	
17	C0	93	7.8			16	
17	C0	93	8.8			16	
17	C0	93	8.4			16	
17	C0	95	9.2			16	
17	C0	96	9.5			16	
17	C0	96	8.9			16	
17	C0	97	9.7			16	
17	C0	98	8			16	
17	C0	98	9.2			16	
17	C0	99	10			16	
17	C0	100	9.9			16	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
17	C0	100	10.3			16	
17	C0	100	9.1			16	
17	C0	102	10.1			21	
17	C0	102	9.7			21	
17	C0	103	11			21	
17	C0	103	10.8			21	
17	C0	103	10.7			21	
17	C0	103	11.1			21	
17	C0	103	11.2			21	
17	C0	103	10.3			21	
17	C0	104	10.3			21	
17	C0	104	10.9			21	
17	C0	105	11.3			21	
17	C0	105	10.9			21	
17	C0	105	11.2			21	
17	C0	105	11			21	
17	C0	105	10.8			21	
17	C0	105	11.5			21	
17	C0	106	12.6			21	
17	C0	106	11			21	
17	C0	107	11.9			21	
17	C0	107	12.1			21	
17	C0	108	13.1			21	
17	C0	108	12.8			21	
17	C0	108	12.3			21	
17	C0	109	12.7			21	
17	C0	109	12.6			21	
17	C0	110	14.2			21	
17	C0	112	14.5			21	
17	C0	112	14.2			21	
17	C0	112	13.8			21	
17	C0	112	13.4			21	
17	C0	112	14.9			21	
17	C0	113	14			21	
17	C0	113	14.3			21	
17	C0	114	14.3			21	
17	C0	114	14.9			21	
17	C0	115	14.5			21	
17	C0	115	13.4			21	
17	C0	117	15.4			21	
17	C0	117	14.9			21	
17	C0	118	15.5			21	
17	C0	120	16.6			21	
17	C0	120	17.2			21	
17	C0	121	18			21	
17	C0	121	17			21	
17	C0	122	18.1			21	
17	C0	123	18.6			21	
17	C0	123	18.5			21	
17	C0	132	22.3				scale loss, not tagged
17	C0	132	22.1			21	
17	C0	142	28.9	51353	37	21	
17	C0	146	33.7	51353	38	21	
17	C0	150	31.9	51353	39	21	not part of random sample
17	CT	121	18				not part of random sample
17	CT	144	31.2				not part of random sample
17	DV	72	3.2				not part of random sample

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
17	DV	174	52.5				R11 L10 (Br. Rays)
17	RB/ST	67	2.7				not part of random sample
17	RB/ST	92	7.5				not part of random sample
17	RB/ST	100	9.9				not part of random sample
17	RB/ST	111	13.5				not part of random sample
17	RB/ST	115	19.1				not part of random sample
18	C0	68		51353	42		no tag
18	C0	75	4.5			16	
18	C0	82					top caudal clip (recapture)
18	C0	86					top caudal clip (recapture)
18	C0	91	8.95				no tag, scale loss, mort
18	C0	92	7.7			16	
18	C0	92	8				scale loss, not tagged
18	C0	93	8			16	
18	C0	94	9			16	
18	C0	94	8.7				no tag, scale loss, mort
18	C0	94	9.1			16	
18	C0	94	8.6			16	
18	C0	95	8.8			16	
18	C0	95					top caudal clip (recapture)
18	C0	95	9.4				no tag scale loss, mort
							no tag scale loss
18	C0	96	9.7			16	
18	C0	96	8.8			16	
18	C0	98	10.5			16	
18	C0	98	10			16	
18	C0	100	10.9				no tag scale loss, mort
18	C0	101	10.4			21	
18	C0	101	10.4			21	
18	C0	102	10.9			21	
18	C0	102	11.3			21	
18	C0	103	10.6			21	
18	C0	104	11.5			21	
18	C0	104	11.4				scale loss, not tagged
18	C0	105	12.8			21	
18	C0	105	11.6			21	
18	C0	106	11.9			21	
18	C0	106	12.4			21	
18	C0	107	13.5			21	
18	C0	107	12.3			21	
18	C0	107	12.5			21	
18	C0	107				21	
18	C0	108	12.7				scale loss, not tagged
18	C0	108	12.9			21	
18	C0	109	12.3			21	
18	C0	109	12.1			21	
18	C0	109	12.8			21	
18	C0	110	14.4			21	
18	C0	111	14			21	
18	C0	112	14.1			21	
18	C0	112	15			21	
18	C0	113					top caudal clip (recapture)
18	C0	113	14.1			21	
18	C0	114					lower caudal clip (recapture)
18	C0	114	14.7			21	
18	C0	116	15.1			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
18	C0	116	15.8			21	
18	C0	118	17.4			21	
18	C0	118	17.4			21	
18	C0	119	17.5			21	
18	C0	119	16.6			21	
18	C0	120	18.3			21	
18	C0	126	20.8			21	
18	CO	102	12.3				no tag, scale loss, mort
18	DV	76	4.23				
18	DV	119	13.8				21 Br. Rays
18	DV	135	20.7				
18	LSU	73					
18	RB/ST	59	1.97				not part of random sample
18	RB/ST	63	2.3				
18	RB/ST	67	3				
18	RB/ST	67	3.1				
18	RB/ST	68	3.2				
18	RB/ST	69	3.1				
18	RB/ST	71	3.3				
18	RB/ST	84	6.5				
18	RB/ST	90	7.8				
18	RB/ST	104	12.7				
18	RB/ST	107	15.7				
18	RB/ST	108	13.6				
18	RB/ST	111	14.1				
18	RB/ST	117	17.9				
18	RB/ST	122	19				
18	RB/ST	134	24.5				
19	C0						not part of random sample, not tagged, wound on abdomin to dorsal, lots of bruising
19	C0	90	7.5			16	
19	C0	94	7.9			16	
19	C0	95	7.8			16	
19	C0	98	9.9			16	
19	C0	98	8.6			16	
19	C0	99	8.9				not tagged, wound on left side
19	C0	99	8.8			16	
19	C0	99	9			16	
19	C0	99	9.8			16	
19	C0	100	9.4			16	
19	C0	100	9.6			16	
19	C0	100	9.8			16	
19	C0	101	10.6			21	
19	C0	102	10.8			21	
19	C0	103	10.7			21	
19	C0	104	11.5			21	
19	C0	104	11.6			21	
19	C0	104	10.5			21	
19	C0	104	11.3			21	
19	C0	104	10.5			21	
19	C0	104	11.8			21	
19	C0	104	10.8			21	
19	C0	105	12.1			21	
19	C0	105	11.3			21	
19	C0	105	10.4			21	
19	C0	105	11.2			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
19	C0	105	11.8			21	
19	C0	107	12.1			21	
19	C0	107	12.9			21	
19	C0	108	12.1			21	
19	C0	109	11.6			21	
19	C0	109	12.8			21	
19	C0	109	12			21	
19	C0	110	13.5			21	
19	C0	110	14			21	
19	C0	111	13.4			21	
19	C0	112	13.1			21	
19	C0	112	14			21	
19	C0	112	14			21	
19	C0	113	14.4			21	
19	C0	114	14.7			21	
19	C0	114	15.3			21	
19	C0	115	15.3			21	
19	C0	116	15			21	
19	C0	116	14.8			21	
19	C0	117	15.4			21	
19	C0	121	18.1			21	
19	C0	122	17.6			21	
19	C0	123	17.4			21	
19	C0	124	18.4			21	
19	CT	107	12.4				
19	DV	74	3.6				not part of random sample
19	RB/ST	65	2.7				not part of random sample
19	RB/ST	73	4.3				not part of random sample
19	RB/ST	115	15.6				not part of random sample
20	C0	93	8.5			16	
20	C0	94	8.5			16	
20	C0	95	8.6			16	
20	C0	96	9.2			16	
20	C0	97	8.6			16	
20	C0	98	10.5			16	
20	C0	98	9.8			16	
20	C0	98	10.2			16	
20	C0	98	9.2			16	
20	C0	98	9.8			16	
20	C0	99	10			16	
20	C0	99	9.6			16	
20	C0	99	10.2			16	
20	C0	100	10.4			16	
20	C0	101	11.1			21	
20	C0	102	11.6			21	
20	C0	103	10.5			21	
20	C0	104	11.8			21	
20	C0	104	12			21	
20	C0	105	13			21	
20	C0	105	11.6			21	
20	C0	106	12.1			21	
20	C0	106	12.7			21	
20	C0	106	11.6			21	
20	C0	106	13			21	
20	C0	107	12.2			21	
20	C0	107	12.4			21	
20	C0	107	12.5			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
20	C0	107	12.8			21	
20	C0	108	13.3			21	
20	C0	108	12.7			21	
20	C0	108	13.2			21	
20	C0	108	13.4			21	
20	C0	108	11.6			21	
20	C0	108	12			21	
20	C0	109	12.5			21	
20	C0	109	13.7			21	
20	C0	109	12.1			21	
20	C0	109	13.2			21	
20	C0	110	14			21	
20	C0	110	13.1			21	
20	C0	111	13.2			21	
20	C0	113	16.1			21	
20	C0	113	14.3			21	
20	C0	116	16.2			21	
20	C0	116	15.7			21	
20	C0	116	16.4			21	
20	C0	117	16.7			21	
20	C0	119	16.3			21	
20	C0	119	17			21	
20	C0	122	17.7			21	
20	C0	123	17.5			21	
20	C0	124	19.3			21	
20	C0	136	26.1			21	
20	CO	106	11.8			21	
20	DV	79	4				
20	DV	155	36.6				not part of random sample, R 10 L 11 (Br. Rays)
20	MW	140	27.7				
20	RB/ST	61	2.7				not part of random sample
20	RB/ST	68	3.4				
20	RB/ST	89	9.3				not part of random sample
21	C0	92	7.6			16	
21	C0	93	8.6			16	
21	C0	96	9.1			16	
21	C0	97	9.4			16	
21	C0	97	9.2			16	
21	C0	98	8.5			16	
21	C0	99	9.5			16	
21	C0	100	9.7			16	
21	C0	100	9.9			16	
21	C0	101	11			21	
21	C0	101	10.1			21	
21	C0	101	11.5			21	
21	C0	103	10.6			21	
21	C0	103	10.8			21	
21	C0	104	12			21	
21	C0	104	10.5			21	
21	C0	104	10.7			21	
21	C0	104	11.2			21	
21	C0	104	12			21	
21	C0	104	11			21	
21	C0	105	12.1			21	
21	C0	105	11.4			21	
21	C0	106	10.7			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
21	C0	106	13			21	
21	C0	106	12.3			21	
21	C0	107	12.2			21	
21	C0	107	12.1			21	
21	C0	107	11.9			21	
21	C0	107	11.1			21	
21	C0	107	12.7			21	
21	C0	107	11.9			21	
21	C0	109	13.4			21	
21	C0	109	12.6			21	
21	C0	110	12.7			21	
21	C0	110	12.8			21	
21	C0	111	13.8			21	
21	C0	112	13.4			21	
21	C0	112	14.1			21	
21	C0	112	13.4			21	
21	C0	113	14.2			21	
21	C0	115	15.4			21	
21	C0	116	15.5			21	
21	C0	117	14			21	
21	C0	117	15.6			21	
21	C0	118	16.9			21	
21	C0	118	15.5			21	
21	C0	119	16.1			21	
21	C0	119	17.2			21	
21	C0	119	17.2			21	
21	C0	119	16.4			21	
21	C0	122	18			21	
21	C0	123	18.8			21	
21	C0	123	19.6			21	
21	C0	123	18.4			21	
21	C0	124	18.4			21	
21	C0	125	19			21	
21	C0	126	19.7			21	
21	C0	130	22.2			21	
21	C0	135	23.4			21	
21	C0	141	27.5	51353	45	21	
21	DV	73	4.3				
21	DV	77	4.6				
21	DV	78	4.6				
21	DV	147	36.2				
21	RB/ST	61	2.2				
21	RB/ST	103	12.5				
21	RB/ST	106	11.5				
21	RB/ST	113	16.1				
21	RB/ST	124	20.5				
21	RB/ST	128	20.3				
21	RB/ST	135	24.4				
22	C0	54	1.6	51353	47		
22	C0	70	3.8	51353	46	16	
22	C0	84	5.7			16	
22	C0	89	6.9			16	
22	C0	92	7.6			16	
22	C0	93	8.2			16	
22	C0	94	8			16	
22	C0	94	8.3			16	
22	C0	94	7.8			16	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
22	C0	95	8.5			16	
22	C0	96	8.8			16	
22	C0	96	8.7			16	
22	C0	97	8.6			16	
22	C0	97	9			16	
22	C0	97	8.9			16	
22	C0	98	9.3			16	
22	C0	98	9.2			16	
22	C0	98	10.1			16	
22	C0	99	9			16	
22	C0	99	9.6			16	
22	C0	99	9.7			16	
22	C0	99	9.3			16	
22	C0	100	9.9			16	
22	C0	100	10.1			16	
22	C0	100	10.7			16	
22	C0	100	9.8			16	
22	C0	101	11.7			21	
22	C0	101	10.7			21	
22	C0	101	10.2			21	
22	C0	102	11.1			21	
22	C0	102	11			21	
22	C0	102	10.6			21	
22	C0	102	10.9			21	
22	C0	102	10.7			21	
22	C0	102	11			21	
22	C0	103	11.6			21	
22	C0	103	11.3			21	
22	C0	103	11.7			21	
22	C0	103	10.2			21	
22	C0	104	10.6			21	
22	C0	104	12.5			21	
22	C0	104	11.7			21	
22	C0	104	12.2			21	
22	C0	104	10.7			21	
22	C0	104	11.5			21	
22	C0	104	10.7				cut on caudal peduncle, not tagged
22	C0	105	11.9			21	
22	C0	105	12.6			21	
22	C0	105	11.7			21	
22	C0	105	11.4			21	
22	C0	105	12			21	
22	C0	106	12.3			21	
22	C0	106	11.9			21	
22	C0	107	12.7			21	
22	C0	107	11.8			21	
22	C0	107	12.5			21	
22	C0	107	11.8			21	
22	C0	108	12.9			21	
22	C0	108	11.9			21	
22	C0	108	12.2			21	
22	C0	108	12.6			21	
22	C0	109	13.5			21	
22	C0	109	13			21	
22	C0	111	14.2			21	
22	C0	112	13.9			21	
22	C0	112	14.8			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
22	C0	112	13.5			21	
22	C0	112	13.6			21	
22	C0	113	14.9			21	
22	C0	113	14.6			21	
22	C0	113	14			21	
22	C0	114	15.4			21	
22	C0	114	16.1			21	
22	C0	115	14			21	
22	C0	115	15.5			21	
22	C0	116	16.6			21	
22	C0	116	15.7			21	
22	C0	117	17.3			21	
22	C0	117	16.8			21	
22	C0	118	17.4			21	
22	C0	119	15.8			21	
22	C0	119	16			21	
22	C0	119	16.8			21	
22	C0	120	18			21	
22	C0	121	18.6			21	
22	C0	124	19.5			21	
22	C0	125	19.2			21	
22	C0	125	19.5			21	
22	CT	102	9.4				
22	CT	111	14				
22	CT	117	15.6				
22	CT	123	16.6				
22	CT	124	18.3				
22	CT	129	94				
22	CT	141	26.6				
22	CT	144	26.7				
22	CT	171	45.4				
22	RB/ST	62	2.6				
22	RB/ST	66	3				
22	RB/ST	101	10.7				
22	RB/ST	104	13				
22	RB/ST	106	12.9				
22	RB/ST	108	13				
22	RB/ST	112	15.1				
22	RB/ST	118	18.2				
22	RB/ST	123	18.4				
22	RB/ST	123	18.5				
22	RB/ST	124	21.2				
22	RB/ST	132	24.4				
22	RB/ST	133	25.3				
22	RB/ST	135	26				
22	RB/ST	138	24.6				
22	RB/ST	155	43.3				
23	C0						no subsample completed
23	C0						
23	C0						
23	C0						
23	C0						
23	CT	108					
23	CT	111					
23	CT	117					
23	DV	78					
23	RB/ST	68					

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
23	RB/ST	68					
23	RB/ST	77					
23	RB/ST	88					
23	RB/ST	95					
23	RB/ST	105					
23	RB/ST	110					
23	RB/ST	111					
23	RB/ST	113					
23	RB/ST	118					
23	RB/ST	120					
24	C0						100 fish >100mm, and 100 fish <100mm were bottom caudal clipped, no tagg was injected, and the adipose was not clipped, included in fish summary
24	C0	72	3.9			16	
24	C0	72	4.1			16	
24	C0	74	4			16	
24	C0	86	6.2			16	
24	C0	88	7			16	
24	C0	89	7.1			16	
24	C0	91	8.3			16	
24	C0	92	7.9			16	
24	C0	92	8			16	
24	C0	93	8.2			16	
24	C0	93	8.4			16	
24	C0	94	8.3			16	
24	C0	95	8.5			16	
24	C0	95	8.9				not tagged, scale loss
24	C0	95	8.3			16	
24	C0	96	9.1			16	
24	C0	96	8.8			16	
24	C0	97	9.2			16	
24	C0	97	9.1			16	
24	C0	97	7.9			16	
24	C0	97	10.6			16	
24	C0	97	9.4			16	
24	C0	97	9			16	
24	C0	98	9			16	
24	C0	98	9.6			16	
24	C0	98	9.4			16	
24	C0	98	9.8			16	
24	C0	98	10.8			16	
24	C0	98	8.9			16	
24	C0	98	10.3			16	
24	C0	99	9.1			16	
24	C0	99	10.3			16	
24	C0	99	10.2			16	
24	C0	99	10.3			16	
24	C0	99	10.5			16	
24	C0	100	10.3			16	
24	C0	100	9.3			16	
24	C0	100	10.9			16	
24	C0	100	9.8			16	
24	C0	100	10.6			16	
24	C0	100	10.5			16	
24	C0	101	10.4			21	
24	C0	101	10.1			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
24	C0	101	11.1			21	
24	C0	102	11.5				not tagged, wound on left side
24	C0	102	11.9			21	split caudal
24	C0	102	11.2			21	
24	C0	102	10.6			21	
24	C0	102	10.7			21	
24	C0	102	10.7			21	
24	C0	103	11			21	
24	C0	103	11.9			21	
24	C0	103	11.4			21	
24	C0	103	10.5			21	
24	C0	103	10.8			21	
24	C0	104	11.5			21	
24	C0	104	11.4			21	
24	C0	104	13.4			21	
24	C0	104	11.5			21	
24	C0	104	11.7			21	
24	C0	104	10.7			21	
24	C0	104	11.7			21	
24	C0	104	11.3			21	
24	C0	105	11.9			21	
24	C0	105	12.3			21	
24	C0	105	12.3			21	
24	C0	105	11.2			21	
24	C0	105	12.4			21	
24	C0	105	11.6			21	
24	C0	105	11.4			21	
24	C0	105	12.1			21	
24	C0	105	12			21	
24	C0	105	11.7			21	
24	C0	105	11.2			21	
24	C0	106	12.3			21	
24	C0	106	12			21	
24	C0	106	11.8			21	
24	C0	106	12.3			21	
24	C0	107	12.2			21	
24	C0	107	12.7			21	
24	C0	107	13.3			21	
24	C0	108	11.2			21	
24	C0	108	13.2			21	
24	C0	108	13.4			21	
24	C0	108	12.3			21	
24	C0	108	12.7			21	
24	C0	109	13.7				not tagged due to poor health
24	C0	109	12.8			21	
24	C0	109	13.5			21	
24	C0	109	12.6			21	
24	C0	110	13.5			21	
24	C0	110	13.9			21	
24	C0	110	13.9			21	
24	C0	110	13.7			21	
24	C0	110	14			21	
24	C0	111	14.3			21	
24	C0	111	15.5			21	
24	C0	111	15.1			21	
24	C0	111	13.8			21	
24	C0	112	14.7			21	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
24	CO	112	14.2			21	
24	CO	115	15.6			21	
24	CO	115	15.8			21	
24	CO	115	15.2			21	
24	CO	115	16			21	
24	CO	116	15.5			21	
24	CO	116	15.6			21	
24	CO	116	16.6			21	
24	CO	116	16.2			21	
24	CO	116	15.9			21	
24	CO	116	15.7			21	
24	CO	117	16.9			21	
24	CO	118	17.6			21	
24	CO	120	17.3			21	
24	CO	121	18.3			21	
24	CO	126	21.3			21	
24	CO	127	21.5			21	
24	CO	100	9.8			16	
24	CT	161	39.1				not part of subsample
24	DV	131	21.8				R 11 L 11 (Br. Rays)
24	RB/ST	61	2.3				
24	RB/ST	65	2.7				not part of subsample
24	RB/ST	68	2.1				not part of subsample
24	RB/ST	72	3.9				not part of subsample
24	RB/ST	82	5.5				not part of subsample
24	RB/ST	90	6.9				not part of subsample
24	RB/ST	92	8.5				not part of subsample
24	RB/ST	99	10.1				not part of subsample
24	RB/ST	102	14.2				not part of subsample
24	RB/ST	103	11.7				not part of subsample
24	RB/ST	111	14.2				not part of subsample
24	RB/ST	114	16.1				not part of subsample
24	RB/ST	117	18.2				not part of subsample
24	RB/ST	117	18.3				not part of subsample
24	RB/ST	119	16.3				not part of subsample
24	RB/ST	119	19.7				not part of subsample
24	RB/ST	139	30.2				not part of subsample
25	CO	72	4.1			16	
25	CO	73	4.3			16	
25	CO	83	5.8				not tagged, scale loss on left side
25	CO	88	7.4			16	
25	CO	91	7.7			16	
25	CO	91	8.8			16	
25	CO	92	7.8			16	
25	CO	93	9			16	
25	CO	94	9.6			16	
25	CO	94	8.3			16	
25	CO	95	8			16	
25	CO	95	9.1			16	
25	CO	95	8.8			16	
25	CO	96	8.8			16	
25	CO	96	8.9			16	recapture bottom caudal only
25	CO	97	9.4			16	
25	CO	98	9.7			16	
25	CO	98	10.8			16	
25	CO	99	10.6			16	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
25	C0	99	9.9			16	
25	C0	99	9.4			16	recapture bottom caudal only
25	C0	99	10.4			16	
25	C0	100	10			16	
25	C0	100	10.1			16	
25	C0	101	10.4			17	
25	C0	101	10.4				not tagged, scale loss
25	C0	102	9.3			17	
25	C0	103	10.7			17	
25	C0	104	11.4			17	
25	C0	105	12.8			17	
25	C0	105	12.2			17	
25	C0	106	11.7			17	
25	C0	107	13.4			17	
25	C0	107	12.6			17	
25	C0	107	13.2				not tagged, major scale loss on right side
25	C0	107	12.3			17	
25	C0	109	13.6				scale loss on left side, not tagged
25	C0	109	13.2			17	
25	C0	109	13.1			17	
25	C0	109	13.3			17	
25	C0	110	13.4				not tagged, scale loss
25	C0	111	13.4			17	
25	C0	111	13.9			17	
25	C0	114	16			17	
25	C0	115	16.5				not tagged, scale loss on right side
25	C0	115	17.1			17	
25	C0	115	15.5				not tagged, wound on caudal peduncle
25	C0	117	16.2				not tagged, scale loss on left side
25	C0	117	16.2			17	
25	C0	119	19.3			17	
25	CO	111	14.1			17	
25	CT	125	18.5				
25	DV	75	4				
25	RB/ST	82	6.5				
25	RB/ST	105	13.2				
25	RB/ST	140	27.5				
25	RB/ST	160	38.9				
33	C0	65	2.8				not tagged
33	C0	68	3.4				not tagged
33	C0	80	6.5			16	
33	C0	81	6.4			16	
33	C0	94	8.2			16	
33	C0	96	8.7			16	
33	C0	96	8.8			16	
33	C0	97	9.4			16	
33	C0	100	9.5			16	
33	C0	102	11			17	
33	C0	102	10.7			17	
33	C0	104	12.6			17	
33	C0	105	12.2			17	
33	C0	105	12			17	
33	C0	105	12.2			17	
33	C0	105	13.1			17	
33	C0	106	11.9			17	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
33	C0	106	11.1			17	
33	C0	106	12.3			17	
33	C0	108	13.2			17	
33	C0	109	13			17	
33	C0	109	13.4			17	
33	C0	110	13.6			17	
33	C0	110	14.3			17	
33	C0	119	16				not tagged, scale loss
33	C0	125	21.2			17	
33	DV	81	5.8				
33	RB/ST	67	3.5				
33	RB/ST	69	3.4				
33	RB/ST	69	3.5				
33	RB/ST	78	5.1				
34	C0	48	1.6				not tagged
34	C0	55	1.8				not tagged
34	C0	65	2.6				not tagged
34	C0	69	3.4				not tagged
34	C0	70	3.9			16	
34	C0	71	3.9			16	
34	C0	73	4.9			16	
34	C0	75	4.5			16	
34	C0	76	5.5			16	
34	C0	76	5.2			16	
34	C0	80	5.8			16	
34	C0	80	6.3			16	
34	C0	80	5.5			16	
34	C0	86	6.7			16	
34	C0	86	7				not tagged mort from live box
34	C0	89	8.8			16	
34	C0	91	7.9			16	
34	C0	95	9.4			16	
34	C0	95	9.6				not tagged, extreme scale loss
34	C0	95	9			16	
34	C0	95	8.9			16	
34	C0	95	9.6				not tagged mort from live box, extreme scale loss
34	C0	96	9.9			16	
34	C0	96	8.3			16	
34	C0	97	10.3			16	
34	C0	98	9.8			16	
34	C0	98	11.2			16	
34	C0	99	9.6			16	
34	C0	100	10.4				not tagged, extreme scale loss
34	C0	100	10			16	
34	C0	101	9.8			17	
34	C0	101	11.6			17	
34	C0	101	10			17	
34	C0	101	10			17	
34	C0	102	12.4				not tagged, mort from live box
34	C0	102	12.7				not tagged, scale loss on left side
34	C0	102	10.7			17	
34	C0	102	12.3			17	
34	C0	103	11.3			17	
34	C0	103	12.2			17	
34	C0	103	12.4			17	
34	C0	103	10.8			17	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
34	C0	103	11.9				not tagged, mort from live box
34	C0	104	11.5			17	
34	C0	104	12.1			17	
34	C0	104	12.2			17	
34	C0	105	12.8				not tagged, mort from live box
34	C0	105	12.3			17	
34	C0	105	12.4			17	
34	C0	105	12.4			17	
34	C0	105	11.7			17	
34	C0	106	14.6				not tagged, mort from live box
34	C0	106	12.9			17	
34	C0	108	14.5				not tagged, mort from live box
34	C0	108	10.7				not tagged, mort from live box
34	C0	108	12.8			17	
34	C0	108	14.6			17	
34	C0	108	12.8			17	
34	C0	109	13.1			17	
34	C0	109	12.8			17	
34	C0	109	14.2			17	
34	C0	109	11.8				not tagged, mort from live box
34	C0	110	14			17	
34	C0	110	14.2			17	
34	C0	111	15.1				not tagged, scale loss on right side
34	C0	112	15.6				not tagged, mort from live box
34	C0	115	15.4			17	
34	C0	115	15.8			17	
34	C0	116	17.2			17	
34	C0	119	18.3			17	
34	C0	120	18.9			17	
34	C0	120	18.1			17	
34	CO	60	2.7				not tagged
34	CO	68	3.8				not tagged
34	RB/ST	66	3.5				
34	RB/ST	66	3.4				
34	RB/ST	77	4.5				
34	RB/ST	80	5.6				
34	RB/ST	92	9.1			16	
34	RB/ST	93	9.1				
34	RB/ST	98	10.9				
34	RB/ST	115	14.5				
34	RB/ST	124	22.9				
34	RB/ST	134	29.6				
35	C0	67	3.2	51357	1		not tagged
35	C0	71	4.1			16	
35	C0	73	3.7			16	
35	C0	73	4.4			16	
35	C0	74	4.5			16	
35	C0	75	4.8			16	
35	C0	78	5.7			16	
35	C0	78	5.5			16	
35	C0	79	5.4			16	
35	C0	79	5.6			16	
35	C0	80	6			16	
35	C0	80	5.5			16	
35	C0	80	6.1			16	
35	C0	81	6.3			16	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
35	C0	91	8			16	
35	C0	92	9.2			16	
35	C0	92	7.9			16	
35	C0	94	8.4			16	
35	C0	94	9			16	
35	C0	94	8.8			16	
35	C0	94	8.6			16	
35	C0	95	8.8			16	
35	C0	95	9.7			16	
35	C0	96	9.2			16	
35	C0	96	7.6			16	
35	C0	98	10.7			16	
35	C0	98	9.8				
35	C0	101	10.7			17	
35	C0	101	10.7				not tagged, mort
35	C0	101	10.6			17	
35	C0	102	12.7			17	
35	C0	103	10.4			17	
35	C0	103	10.7			17	
35	C0	104	10.3			17	
35	C0	104	12.1			17	
35	C0	104	12			17	
35	C0	106	13				not tagged, mort
35	C0	108	13.9			17	
35	C0	109	13.5			17	
35	C0	109	14.5			17	
35	C0	110	13			17	recapture only bottom caudal
35	C0	110	14			17	
35	C0	111	15.6			17	
35	C0	115	15.8			17	
35	C0	115	16.6			17	
35	C0	115	16.8			17	
35	C0	116	15.2			17	
35	C0	125	20.6			17	
35	RB/ST	60	2.2				
35	RB/ST	60	2.4				
35	RB/ST	70	4.1				
35	RB/ST	73	3.9				
35	RB/ST	74	5.1				
35	RB/ST	74	4.3				
35	RB/ST	75	4.6				
35	RB/ST	80	4.8				
35	RB/ST	82	6				
35	RB/ST	94	9				
35	RB/ST	99	11.1				
35	RB/ST	104	12.4				
35	RB/ST	105	12.8				
35	RB/ST	115	16				
35	RB/ST	135	28.9				
36	C0	56	2	51357	3		not tagged
36	C0	64	3.1	51357	2		not tagged
36	C0	74	4.8			16	
36	C0	74	8.6			16	
36	C0	88	7.3			16	
36	C0	90	7.6			16	
36	C0	90	8.4			16	
36	C0	91	7.8			16	

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
36	C0	94	8.9			16	
36	C0	95	9.8			16	
36	C0	97	9.5			16	
36	C0	98	9.7			16	
36	C0	101	11.8			17	
36	C0	103	10.5			17	
36	C0	103	11.4			17	
36	C0	104	12			17	
36	C0	104	11.1			17	
36	C0	104	11.5			17	
36	C0	105	11.6			17	
36	C0	105	13			17	
36	C0	106	11.7			17	
36	C0	106	13			17	
36	C0	106	11.9			17	
36	C0	108	14			17	
36	C0	109	13.5			17	
36	C0	115	15.9			17	
36	C0	117	16.8			17	
36	C0	144	14.4			17	
36	CT	106	13.6				
36	CT	137	32.1				
36	DV	156	45.3				R 10 L 11 (Br. Rays)
36	LSU	144	35.1				
36	RB/ST	60	2.3				
36	RB/ST	69	3.6				
36	RB/ST	74	4.7				
36	RB/ST	77	5.3				
36	RB/ST	87	8.1				
36	RB/ST	91	8.2				
36	RB/ST	99	10				
36	RB/ST	102	11.6				damaged eye
36	RB/ST	105	10.9				
36	RB/ST	108	14.8				
36	RB/ST	115	16.9				
36	RB/ST	120	19.6				
36	RB/ST	122	17.5				
36	RB/ST	124	25.8				
36	RB/ST	126	21.6				
37	C0	69	3.5				not tagged
37	C0	78	5			16	
37	C0	79	5.1			16	
37	C0	96	7.6			16	
37	C0	97	10			16	
37	C0	97	9.6			16	
37	C0	99	10.1			16	
37	C0	101	8.8			17	
37	C0	101	9.7				not tagged, scale loss
37	C0	102	10.4			17	
37	C0	103	10.6			17	
37	C0	107	13.3			17	
37	C0	108	13			17	
37	C0	109	13.5			17	
37	C0	110	13.4			17	
37	C0	111	13.3			17	
37	C0	121	18.8			17	
37	RB/ST	68	3.5				

Day	Species	Fork Length	Weight	Scale Book #	Scale #	Tag Spool	General Comments
37	RB/ST	69	3.9				
37	RB/ST	72	4.5				
37	RB/ST	74	4.2				
37	RB/ST	79	5.6				
37	RB/ST	81	5.7				
37	RB/ST	82	5.9				
37	RB/ST	88	6.6				
37	RB/ST	89	7.7				
37	RB/ST	106	14				
37	RB/ST	108	13.3				
37	RB/ST	114	18.6				
37	RB/ST	120	23.3				
37	RB/ST	126	27.5				
38	C0	88	6.5			16	
38	C0	92	9.2			16	
38	C0	95	8.8			16	
38	C0	98	8.1			16	
38	C0	101	10.3			17	
38	C0	104	11.3			17	
38	C0	104	11.5			17	
38	C0	106	13.3			17	
38	C0	109	13.5			17	
38	C0	114	14.2			17	
38	CO	54	1.9				not tagged
38	CO	72	4				
38	RB/ST						
38	RB/ST	65	3.2				
38	RB/ST	67	3.6				
38	RB/ST	68	3.5				
38	RB/ST	69	3.4				
38	RB/ST	71	3.9				
38	RB/ST	72	4.6				
38	RB/ST	74	5				
38	RB/ST	75	4.7				
38	RB/ST	76	5				
38	RB/ST	76	4.9				
38	RB/ST	77	5.9				
38	RB/ST	78	5.6				mort
38	RB/ST	79	5.1				
38	RB/ST	83	6				
38	RB/ST	84	5.7				
38	RB/ST	84	7.8				
38	RB/ST	98	11.1				
38	RB/ST	127	23.7				