SIZE, DISTRIBUTION AND ABUNDANCE OF JUVENILE CHINOOK SALMON OF THE NECHAKO RIVER, 1995

NECHAKO FISHERIES CONSERVATION PROGRAM
Technical Report No. M95-3

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ABSTRACT

The size, distribution, and abundance of juvenile chinook salmon (*Oncorhynchus tshawytscha*) was measured in 1995 in the upper 100 km of the Nechako River as part of the seventh year of the Nechako Fisheries Conservation Program (NFCP). Electrofishing surveys showed that the center of distribution of resident 0+ chinook moved upstream from May to June as the fish searched for rearing habitat. In the fall, resident 0+ chinook redistributed themselves evenly along the length of the upper river in preparation for overwintering. Maximum density of electrofished 0+ chinook occurred in mid-May and then decreased over the May-November period at an average rate of 0.22 %/d for day catches and 1.07 %/d for night catches. Maximum numbers of outmigrating 0+ chinook captured by rotary screw traps at Diamond Island also occurred in mid-May. Rotary screw trap catches of juvenile chinook decreased over the May-June period at a rate of 5.62 %/d for day catches and 4.62 %/d for night catches. A total of 2,563 0+ chinook and 94 1+ chinook were captured by the rotary screw traps. Expansion of these numbers by the proportion of river volume sampled by the traps provided an index of downstream migration of 45,025 0+ chinook and 1,660 1+ chinook.

INTRODUCTION

This report describes juvenile chinook salmon (*Oncorhynchus tshawytscha*) size, distribution and abundance in the upper 100 km of the Nechako River in 1995. The investigations were carried out as part of the seventh year (1995-1996) of the Nechako Fisheries Conservation Program (NFCP). The objectives of the investigations were to measure the size and growth of juvenile salmon and their spatial-temporal distribution in the upper Nechako River, and to obtain an index of the number of juveniles that migrated downstream of Diamond Island from March to July.

METHODS

Study Sites

The study area included the upper 100 km of the Nechako River from Kenney Dam to Fort Fraser (Figure 1). It was divided into four reaches with the following boundaries, as originally defined by Envirocon Ltd. (1984):

Reach	Distance (km) from Kenney Dam
1	9.0-14.6
2	14.6-43.0
3	43.0-66.6
4	66.6-100.6

In this report, all longitudinal distances are in kilometers from Kenney Dam. The first 9 km of the river are within the Nechako River Canyon, which was dewatered by the closing of Kenney Dam in October 1952. The majority of the flows in the upper river occur downstream of Cheslatta Falls.

Water Temperature and Discharge

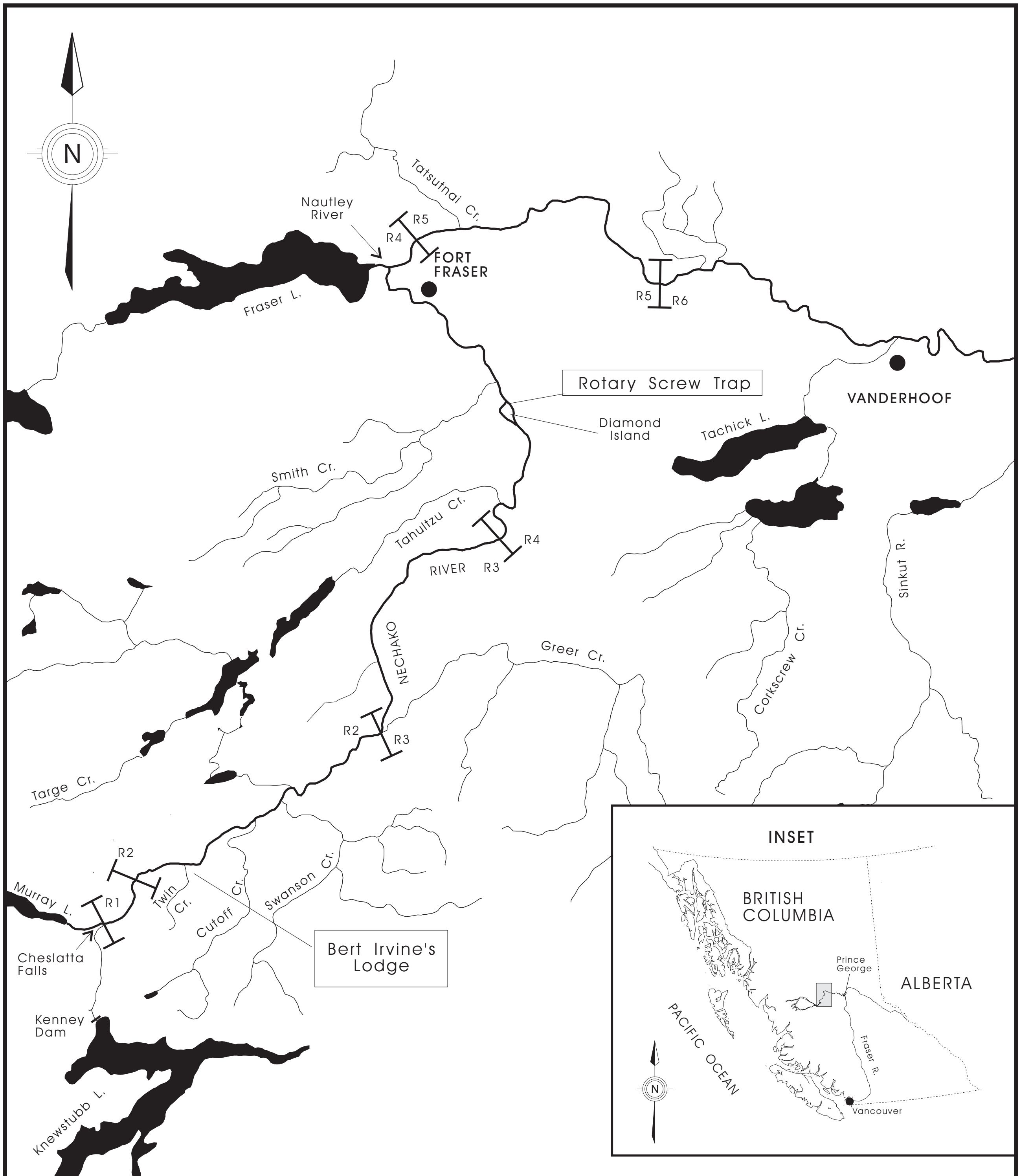
Mean daily water temperatures were measured by a datalogger at Bert Irvine's Lodge in Reach 2 of the river, 19 km below Kenney Dam. They are reported as preliminary data from Environment Canada.

Daily spot temperatures were recorded by handheld thermometers at Diamond Island, approximately 70 km below Kenney Dam, as part of the operation of the rotary screw traps. They are reported as data from Triton Environmental Consultants Ltd.

Daily water flows were recorded at Skins Lake Spillway (WSC station 08JA013) and at the Nechako River below Cheslatta Falls (WSC station 08JA017), and are reported as preliminary data from Water Survey of Canada (WSC).

Electrofishing Surveys

Each year since 1990, NFCP has conducted electrofishing surveys of the upper Nechako River to measure the relative abundance and spatial distribu-



Nechako Fisheries Conservation Program

Map # M95-3-1

0 25 km

FIGURE 1. 1995 NECHAKO RIVER STUDY AREA AND TRAP LOCATIONS

tion of juvenile chinook. The surveys began as a temporary replacement for inclined plane traps that were rendered inoperable in 1990 due to high river flows. Over the last six years they have become one of the most important components of the chinook monitoring program, mainly because they show spatial variation in juvenile density during spring and summer-something no fixed gear can do-and because electrofishing can be done at high flow levels that would render some fixed gear inoperable.

In 1995, as in previous years, an index of juvenile chinook salmon abundance was obtained from single-pass electrofishing surveys of each of the four reaches. Surveys began in April and continued through May and June. They were discontinued during July and August because summer cooling flows were too high to allow safe and effective electrofishing. Large flows are released into the upper river during July and August to cool the river and thereby reduce prespawning mortality of sockeye salmon (*Oncorhynchus nerka*) migrating through the lower Nechako River to spawning grounds in the Stuart, Stellako and Nadina River systems. The program of releases is called the Summer Temperature Management Program or STMP. Electrofishing surveys resumed in September and November. Surveys of Reaches 1 through 4 were completed in each of the months sampled. Electrofishing surveys were carried out at night as well as during the day. Night was defined as the time period between sunset and sunrise.

Surveys were conducted on prime habitat for juvenile chinook salmon, defined as depth>0.5 m, velocity>0.3 m/s and a substrate of gravel and cobble (Envirocon Ltd. 1984). That habitat was found mainly along the margins of the river, so electrofishing surveys did not sample the portion of the population that may have resided in mid-channel. However, mid-channel residents are a minor component of the population of juvenile chinook. Electrofishing surveys conducted by the Department of Fisheries and Oceans showed that the densities of chinook inhabiting the margins of the river were 70 times greater than mid-channel densities (Nechako River Project 1987). The same study also showed that 97% of juvenile chinook observed by snorkelling were found along river margins.

Fish were captured with a single pass of a Smith Root model 15A backpack electrofisher, identified to species, counted, and released live back into the river. Catch-per-unit-effort (CPUE) of juvenile chinook was the number of fish caught at a site divided by the area that was electrofished. Area was expressed in units of 100 m^2 to avoid fractional CPUE. Age of juvenile chinook was recorded as 0+ or 1+, based on fork length. Juvenile chinook less than 90 mm long were classified as 0+. Those over 90 mm in length in the spring and early summer were classified as 1+, but those over 90 mm long in late summer were classified as 0+ because by that time all 1+ chinook had migrated out of the upper Nechako River. Rainbow trout were classified as juveniles if their length was <200 mm and adults if their length was >200 mm.

Before release, 10 to 15 chinook were measured for body size. Fork length was measured to the nearest 1 mm with a measuring board, and wet weight was measured to the nearest 0.01 g with an electronic balance. Following the practice of previous years, Fulton's condition factor (Ricker 1975):

$$(1) \quad CF = \text{weight (g)} \times 10^5 / [\text{fork length (mm)}]^3$$

was used as an index of physical condition.

Mean daily length and weight of 0+ and 1+ chinook were calculated separately for day and night catches because fish could potentially avoid sampling gear more successfully during the day than during the night, and because the behaviour of juvenile chinook varies with time of day-resting near instream cover during the day and migrating during dusk and dawn.

It is important to note that electrofished areas were not blocked off with nets, which meant that some fish could avoid capture by leaving a sampling area during a pass or by diving into crevices in the substrate. That meant that electrofishing catch was an underestimate of the total number of fish in a survey area. Two-pass or three-pass sampling of blocked off survey areas would have been necessary to estimate total numbers. However, the Nechako River electrofishing survey was not designed to estimate absolute numbers-it was designed to provide an index of relative abundance which could be compared between years.

That sampling strategy is called “semi-quantitative”, to use a term coined by Crozier and Kennedy (1995). It has two advantages over the fully quantitative method. First, it is the only electrofishing technique that can be used when it is impossible or impractical to enclose a survey area in blocking nets because the area is too large to be enclosed or flows through the area are too strong to allow nets to be installed. For example, almost all electrofishing conducted in lakes and reservoirs (DeVries et al. 1995; Van Den Ayle et al. 1995; Miranda et al. 1996), and in large rivers (R.L.&L. Environmental Services Ltd. 1994), is semi-quantitative. The upper Nechako River is too wide, deep and fast-moving to allow any part of the mainstem to be blocked off with nets.

Second, it is often necessary to use semi-quantitative methods when the region to be surveyed is large and contains many possible survey sites, but the time and resources available for sampling are limited (Crozier and Kennedy 1995). The upper Nechako River is too long for cost-effective quantitative sampling of its entire length several times a year.

There are two disadvantages of the semi-quantitative method. First, semi-quantitative electrofishing CPUE cannot be compared to fully quantitative CPUE unless the former are calibrated by the latter. That is, unless total numbers are estimated for a subset of the same areas that are semi-quantitatively surveyed, and a calibration relationship is developed from a comparison of the two types of CPUE (e.g., Serns 1982; Hall 1986; Coble 1992; McInerny and Degan 1993; Edwards et al. 1987). At present, conversion of electrofishing CPUE to absolute CPUE is not an NFCP objective because the purpose of the electrofishing surveys is to search for among-year variation in relative abundance of juvenile chinook abundance and not to compare it with absolute abundances of other chinook streams.

Second, semi-quantitative sampling assumes that the efficiency of capture, the fraction of total number of fish in a survey area that are caught in a single electrofishing pass, is constant for all sites and species of fish. However, electrofishing catch efficiency is known to vary significantly with fish species, fish body size, type of habitat, time of day, water temperature, and the training and experience of personnel conducting the survey (Bohlin et al. 1989, 1990). The NFCP electrofishing project reduced error in estimation of CPUE by sampling only one type of habitat (prime juvenile chinook habitat), by focusing analysis on only one species (chinook), by analysing CPUE from night and day surveys separately, and by using the same experienced crew leaders each year. However, the study plan does not account for changes in catch efficiency due to seasonal changes in fish size and water temperature.

Rotary Screw Traps

Rotary screw traps (RST) were used to estimate the number of juvenile chinook that migrated downstream past Diamond Island. RSTs were installed in early April and removed in late July to avoid high summer cooling flows in August. The traps were not re-installed in September because too few chinook salmon had been caught in the fall of previous years to justify re-installation of traps.

An RST consisted of a floating platform on top of which was a rotating cone. In front of the cone was an A-frame with a winch that was used to set the vertical position of the mouth of the cone, half of which was always submerged. In the back of the cone was a live box where captured fish were kept alive until the trap was emptied. The cone was 1.43 m long and was made of 3 mm thick aluminum sheet metal with multiple perforations to allow for draining of water. The diameter of the cone tapered from 1.55 m at the mouth to 0.3 m at the downstream end. Inside the cone was an auger or screw, the blades of which were painted black to reduce avoidance by fish. As the current of the river struck the blades of the screw, it forced the cone to rotate. Any fish that entered the cone were trapped in a temporary chamber formed by the screw blades. As the cone rotated, the chamber moved down the cone until its contents were deposited in the live box.

Three RSTs were installed off Diamond Island: RST 1 near the left bank, RST 2 in the middle of the river, and RST 3 near the right bank. RSTs were suspended from a cable strung across the river channel. The 1.5 m space between the right bank of the river and RST 3 was blocked with a wing made of wood beams with wire mesh. The 15 m long space between the left bank of the river and RST 1 was not blocked with a wing. Instead, one 2’x3' inclined plane trap (IPT) and three fyke nets were set side-by-side in the space to measure the outmigration of fish along the margin of the left river.

Each trap was emptied twice each day at about 0700 and 2000 hours. All fish were collected from the live trap and counted and identified to species. A subsample of 10-15 chinook salmon was kept for length and weight measurement using the same techniques described above for the electrofishing surveys, after which all fish, including the subsampled fish, were released live back into the river.

An index of the number of juvenile chinook passing Diamond Island in a day was calculated by multiplying the total number of fish caught in an RST in a time period (day or night) by the ratio of the total flow of the river to the flow that passes through the RST:

(2) $N_{ij} = n_{ij}(V_j / v_{ij})$

where N_{ij} = number of juvenile salmon passing Diamond Island on the *jth* date as estimated by the catches of the *ith* trap, n_{ij} = number of chinook salmon caught in the *ith* trap on the *jth* date, v_{ij} = water flow ($m^3.s^{-1}$) through the *ith* trap on the *jth* date, and V_j = total water flow (m^3/s) of the Nechako River past Diamond Island on the *jth* date. All analyses of rotary screw trap data were based on expanded numbers rather than on catches.

V_j was estimated from the height of the river surface at Diamond Island, as measured with a staff gauge, using a linear regression between flow and the height of the staff gauge ($n = 7$, $r^2 = 0.99$, $P<0.001$):

(3) $\log_e(\text{Nechako flow, m}^3/\text{s}) = -2.636 + 1.519*\log_e(\text{staff height, cm})$

The regression was calculated for steady flow conditions. Those occurred from April 16 to May 21, ranging from 47.5 to 64.0 m^3/s at Cheslatta Falls and from 51.6 to 69.1 m^3/s at Smith Creek near Diamond Island. Equation (3) was similar to flow-height equations used in previous years. Flows and staff gauge height were $\log_e$-transformed to linearize the exponential relationship between the two variables.

Water flow through a trap (v_{ij}) was the product of one half the cross-sectional area (1.61 m^2) of the mouth of the trap (the trap mouth was always half-submerged) and average water velocity in front of the trap. Average water velocity (m/s) was measured with a Marsh-McBirney flow meter at three different places in the front of the mouth of the RST. The one exception to this rule was RST 3, where v_{ij} was increased to include the water that flowed between it and the right bank of the river because the fish that would ordinarily have passed through this gap were diverted into RST 3 by the right wing.

Since there were three RSTs, there were three estimates of total number each day. The best estimate of the total index number of chinook salmon was the mean of the three estimates weighted by the flow that passed through each trap.

Inclined Plane Traps

An inclined plane trap (IPT) was installed at Diamond Island in early April and removed in late June. As in previous years, too few chinook salmon were caught after June to justify operating the IPT during the remainder of the year.

The 2’x3' IPT was set just left of RST 1, located near the left bank, at Diamond Island. Its purpose was to measure the number of fish passing between RST 1 and the left margin of the river. This allowed an assessment of the practical effect of blocking the 15 m distance between RST 1 and the left margin of the river with a wood and mesh wing, as was done in years previous to 1992. If substantial numbers of fish were caught by the IPT, then one could conclude that the wing had been directing fish into the traps; but if IPT catches were relatively small, then one could conclude that the wing had not been directing fish into the traps. The IPT was not used to estimate the total index number of fish passing past Diamond Island because IPTs have serious avoidance problems.

The IPT consisted of two aluminum pontoons supporting an inclined plane 0.9 m wide, the bottom edge of which touched the bottom of the river. The IPT was anchored by pushing its four steel supporting legs into the substrate. Fish that approached the trap were forced by water flow up the plane and over its downstream edge into a live box at the back of the trap. Some large fish were undoubtedly able to avoid capture by swimming downstream before falling over the edge of the trap. However, this was unlikely to have significantly reduced catches of 0+ chinook because fish larger than the largest 0+ chinook were captured by IPTs. The box was emptied twice each day at the same time as the live boxes of the RSTs, and the contents were processed in the same manner as those of the RSTs. The daily catches of the IPT were not expanded by water volume to calculate indices of the number of fish passing Diamond Island.

Fyke Nets

Fyke nets were used for the same purpose as the IPT, and they were installed and removed at the same times as the IPT.

Fyke nets are mesh bags with a rectangular mouth 30 cm high and 60 cm wide supported by metal bars. Three fyke nets were anchored to the left of the IPT with steel poles pushed into the river substrate. Fyke net 1 was placed closest to the left bank of the river in water about 10 cm deep. Fyke net 2 was placed farther out into the river in about 20 cm of water, and fyke net 3 was placed between fyke net number 2 and the IPT in about 30 cm of water. The bottom of each net mouth touched the river bottom and the top was about 10 cm above the water surface so the entire water column was sampled. The net was 1 m long with a mesh width of 0.64 cm. The net led into the top of a live box. The contents of the box were collected twice a day at the same time as the RSTs and the IPT, and they were processed the same way. Fyke net catches were not expanded to calculate indices of total population number.

RESULTS AND DISCUSSION

Water Temperature

Mean daily water temperature of the Nechako River at Bert Irvine's Lodge rose from a minimum of 0.1°C in January to a maximum of 19.6°C in late June and then decreased to a second minimum of 0.1°C in early December (Figure 2).

Mean spot temperatures at Diamond Island followed a similar temporal pattern during the spring and early summer, but they were about 1°C higher than temperatures at Bert Irvine's due to solar heating of river water as it passed downstream.

Discharge

Flow of the Nechako River was roughly constant at an average of 45.4 m^3/s from January 1 to July 11, 1995 (Figure 3). From July 11 to August 16, flows from the Skins Lake Spillway were increased as part of the STMP. The increases were in the form of two broad pulses, the first to a maximum of 453.1 m^3/s on July 17-19, and the second to 169.9 m^3/s on July 26-August 16. After falling to 14.3 m^3/s on August 17-September 1, flows increased to an average of 32.2 m^3/s for the remainder of the year. The pulses resulted in flows in the Nechako River below Cheslatta Falls of up to 298.0 m^3/s.

Size and Growth of Chinook Salmon

Electrofishing

<u>*0+ Chinook Salmon: Sources of Variation*</u>

To determine the factors responsible for changes in the size of 0+ chinook salmon over time, standard two-factor analyses of variance (ANOVA) of length-at-date and weight-at-date were conducted with two factors: time of day (two classes: day and night) and date (four classes: April 1-30, May 1-31, June 1-30 and November 1-30). In this case, and in all subsequent ANOVAs of this study, the date classes were chosen so that there was a roughly equal distribution of data in each class. The ANOVAs showed that:

(1) there was highly significant variation with date of mean length ($F_{3,2329}$ = 7053.378, $P<0.001$) and mean weight ($F_{3,2327}$ = 4861.281, $P<0.001$). Figures 4 and 5 (and Appendix 1) showed that the variation was due to growth;

(2) mean length ($F_{1,2329}$ = 32.998, $P<0.001$) and mean weight ($F_{1,2327}$ = 6293.832, $P<0.001$) of 0+ chinook salmon were highly significantly different between day and night catches. Mean length was 48.7 mm (SD = 14.0, n = 1771) at night compared to 45.0 mm (SD = 17.1, n = 566) during the day. Mean weight was 1.64 g (SD = 2.08, n = 1771) at night compared to 1.45 g (SD = 2.82, n = 564) during the day. The most likely reasons for the apparent day-night size differences are: (a) greater vulnerability of fish of all sizes to capture at night than during the day because fish cannot de-

Figure 2
Mean Daily Water Temperatures of the Nechako River, 1995

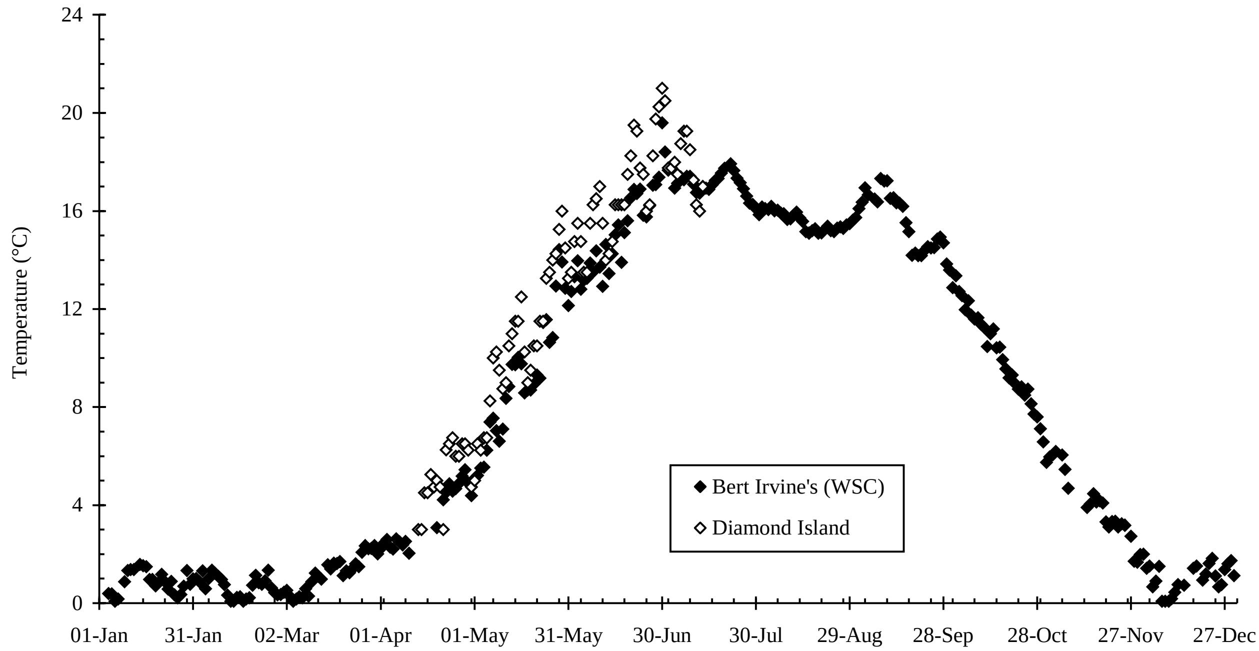
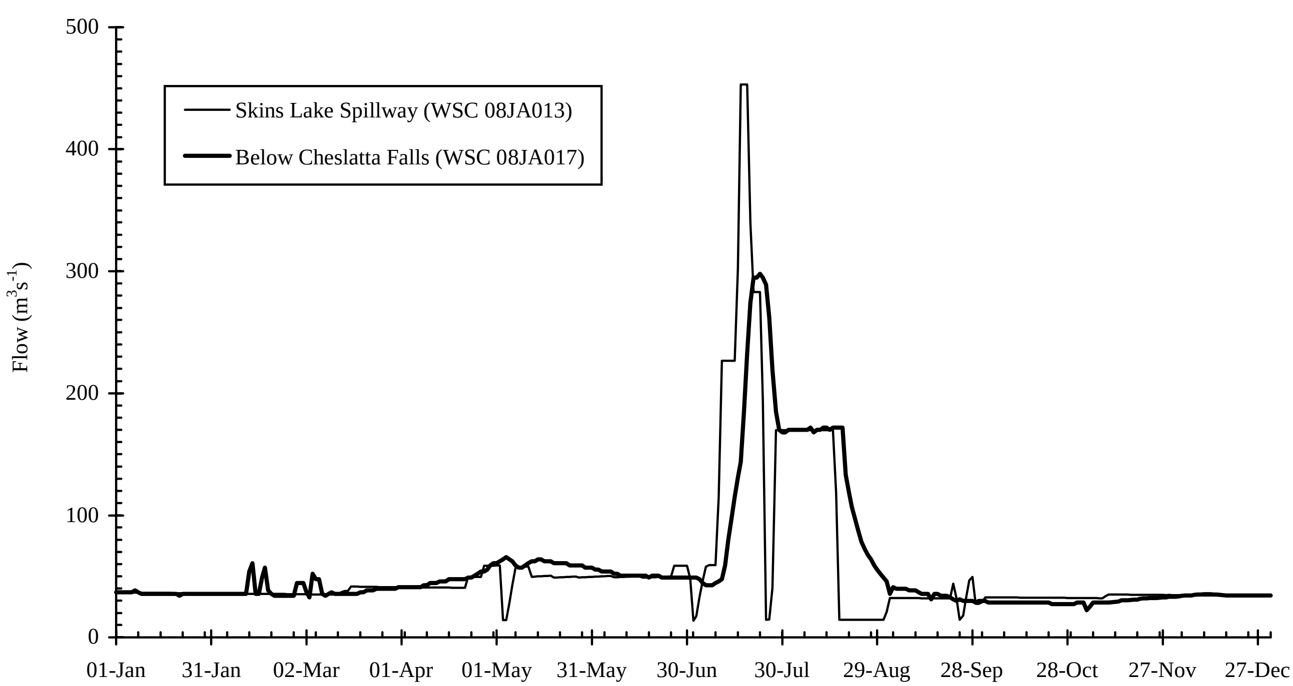


Figure 3
Mean Daily Flow of the Nechako River at Skins Lake Spillway and Cheslatta Falls, 1995



tect and avoid electrofishing gear as well at night as during the day; and (b) a wider size range of fish are active along the river margins at night than during the day because all juvenile chinook tend to migrate more at night than during the day to avoid predators; and

(3) the interaction of date and time of day was highly significant for length ($F_{3,2329}$ = 20.081, P<0.001) but not significant ($F_{3,2327}$ = 2.177, P>0.140) for weight. Figures 4 and 5 show that for both length and weight, mean night sizes were greater than mean day sizes for the first three of the four date classes. For an unknown reason, the situation in November was reversed with mean lengths and weights of November day catches being greater than the mean lengths and weights of November night classes. The variances of the mean lengths were small enough that this difference between date classes was significant, but the variances of mean weights were large enough that the difference was not significant.

0+ Chinook Salmon: Growth

Growth of 0+ chinook salmon electrofished along the river margins appeared to follow two separate growth stanzas (Ricker 1979). Growth was very slow between April and May, but much faster between May and June and between June and November (Figures 4 and 5). The first stanza was due to continuous emergence of fry over a period of several weeks-the numbers of emergent fry were great enough to force the mean size of all fry caught to stay close to the mean size of emergent fry. After emergence ceased, the second stanza began and the true growth rate of juvenile chinook became apparent. Based on the curvature of the mean length-at-date and weight-at-date plots shown in Figures 4 and 5, emergence ceased sometime in mid-May.

Growth of 0+ chinook salmon after emergence ceased was described with a one-cycle Gompertz growth curve (Zweifel and Lasker 1976), the standard growth model for the early life history stages of fish. A "cycle" is a period of constant growth pattern with the same meaning as a "growth stanza". The Gompertz model for length was:

(4) $L = L_0 \exp[(A_0/\alpha)(1-\exp(-\alpha t))]$

where L = length (mm) at age t (d), L_0 = length (mm) at emergence, A_0 = instantaneous growth rate (d^{-1}) at emergence, and α = instantaneous rate (d^{-1}) at which A_0 decayed with age. The one-cycle Gompertz model for weight was the same as equation (4) except that W_0, the weight (g) at emergence, was substituted for L_0.

The simplest way of estimating age from date was to modify equation (4) by inserting the parameter DOY_0, the mean day of the year (DOY) on which emergence ceased and the second growth stanza began. Therefore, t = DOY - DOY_0 and the modified Gompertz model for length was:

(5) $L = L_0 \exp[(A_0/\alpha)(1-\exp(-\alpha (DOY - DOY0)))]$.

L_0 was fixed at 38 mm and W_0 was fixed at 0.40 g, the mean length and weight of emergent chinook fry caught in emergence traps located near Bert Irvine's (Triton Environmental Consultants Ltd. 1996). Values of A_0, α and DOY_0 were estimated from mean daily lengths and weights with the non-linear regression program NLR of the SPSS statistical library (SPSS 1994). Each daily mean was weighted by its sample size. Day and night data were pooled to produce a single growth curve. (Although mean sizes were significantly different between day and night catches, the magnitude of the differences were small, there was only one population of juvenile chinook present in the Nechako River, and there is little practical value in calculating separate growth curves for day- and night-caught fish.) Mean length-at-date and weight-at-date collected in April was excluded because it belonged to the first growth stanza.

The modified Gompertz curves provided good fits to lengths-at-date and weights-at-date, explaining up to 99% of the variation in mean size (Figures 4 and 5). The average date at which emergence ceased was estimated to be May 9 (DOY = 129) for length and May 8 (DOY = 128) for weight.

1+ Chinook Salmon: Growth

Growth of 1+ chinook was best described with simple linear regressions of mean length and weight on day of year, with mean size weighted by sample size (Figures 6 and 7). The length-DOY regression was significant-mean length of 1+ chinook rose from 98 mm on April 14 (DOY = 104) to 105 mm on May 15 (DOY = 135) at a rate (±1 SE) of 0.22±0.03 mm/d. The

Figure 4
Mean (±1 SD) Length-At-Date of 0+ Chinook Salmon,
Nechako River, 1995: Electrofishing

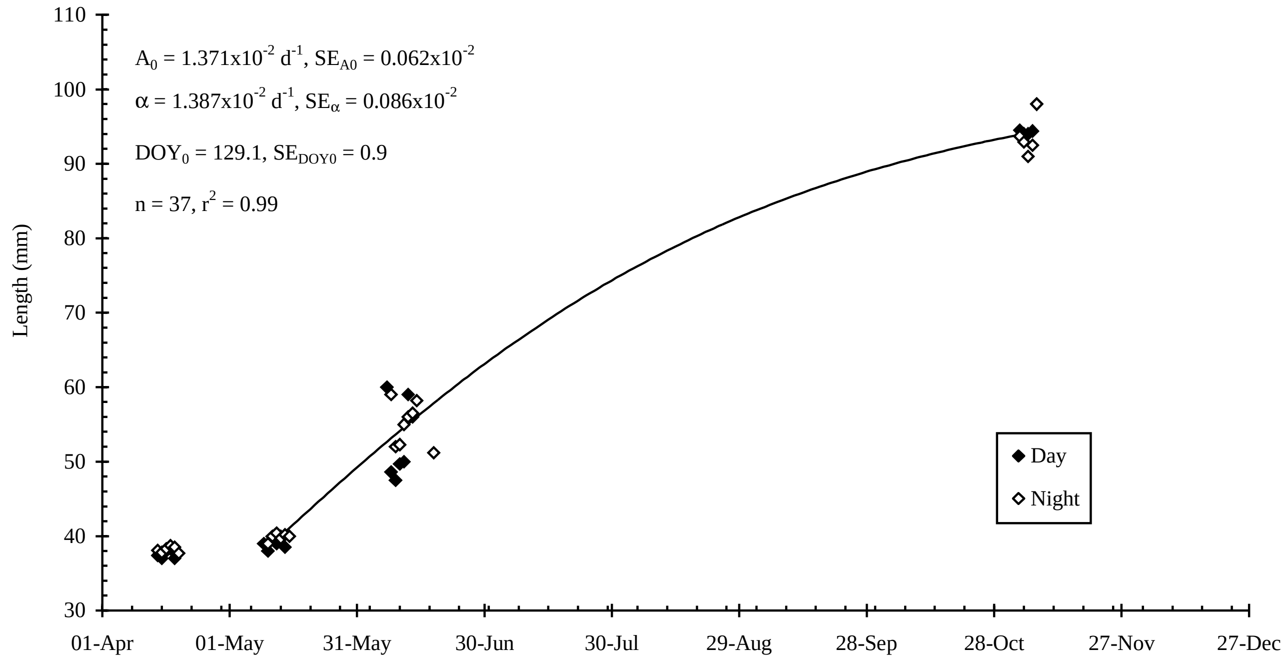


Figure 5
Mean (±1 SD) Weight-At-Date of 0+ Chinook Salmon,
Nechako River, 1995: Electrofishing

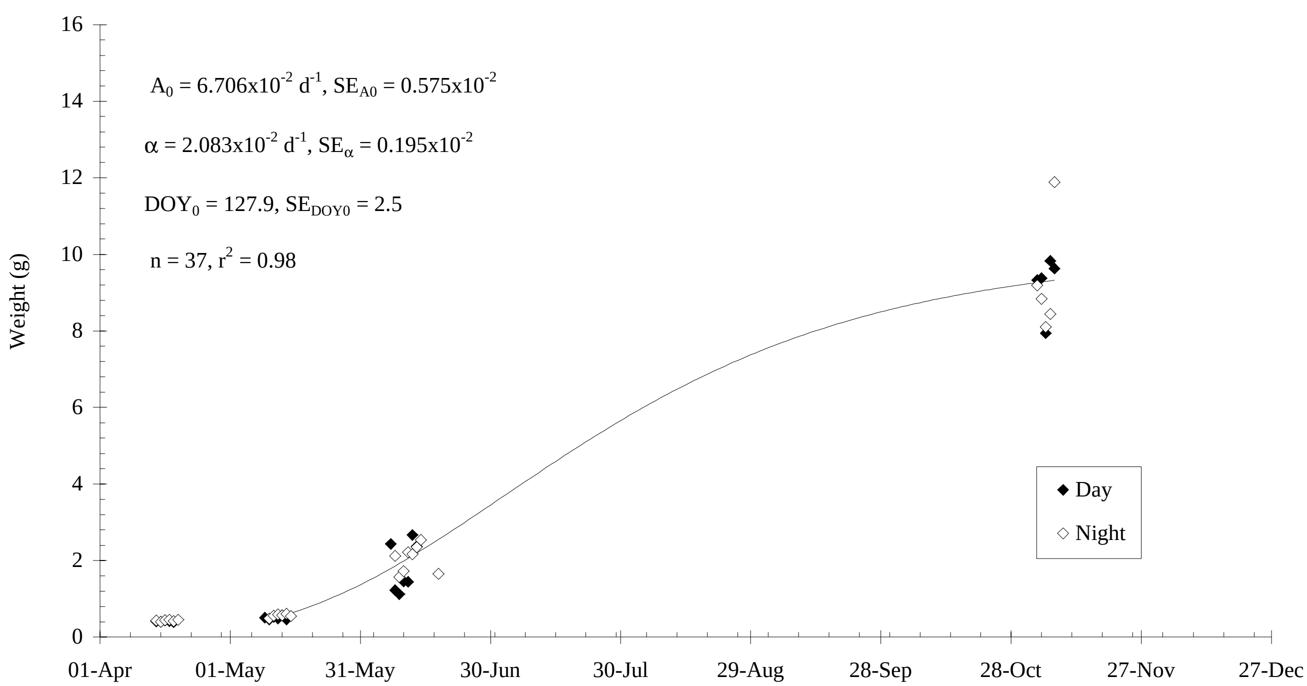


Figure 6
Mean (±1 SD) Length-At-Date of 1+ Chinook Salmon, Nechako River, 1995: Electrofishing

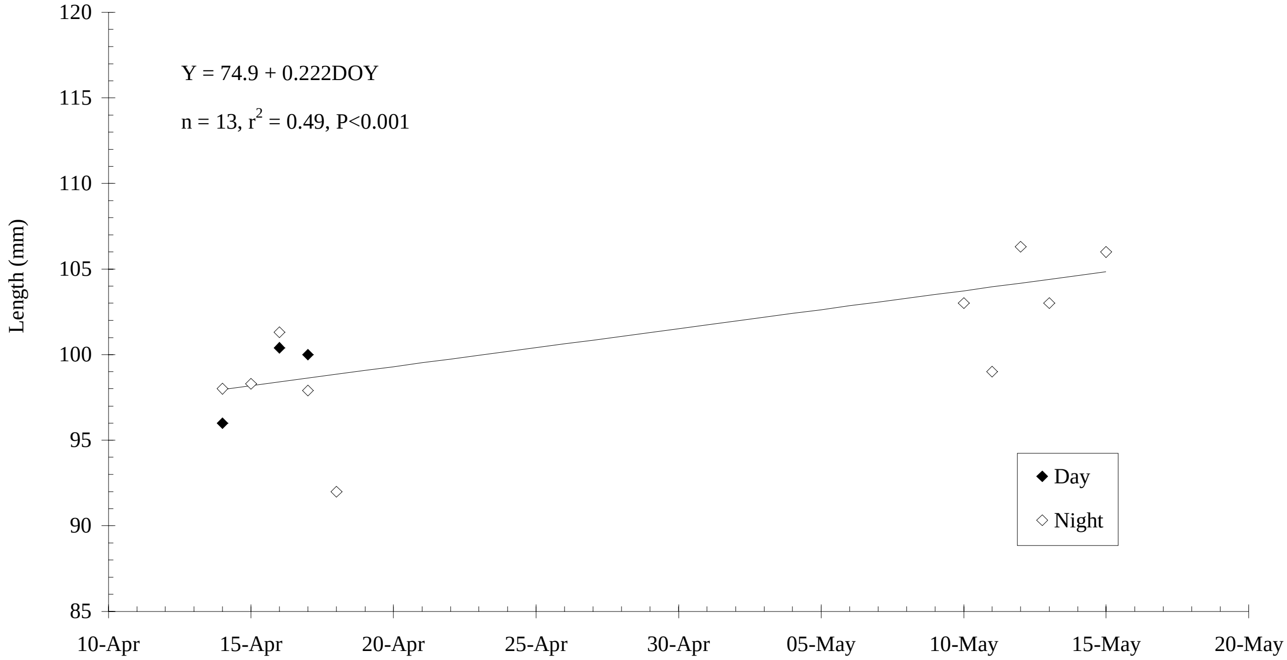
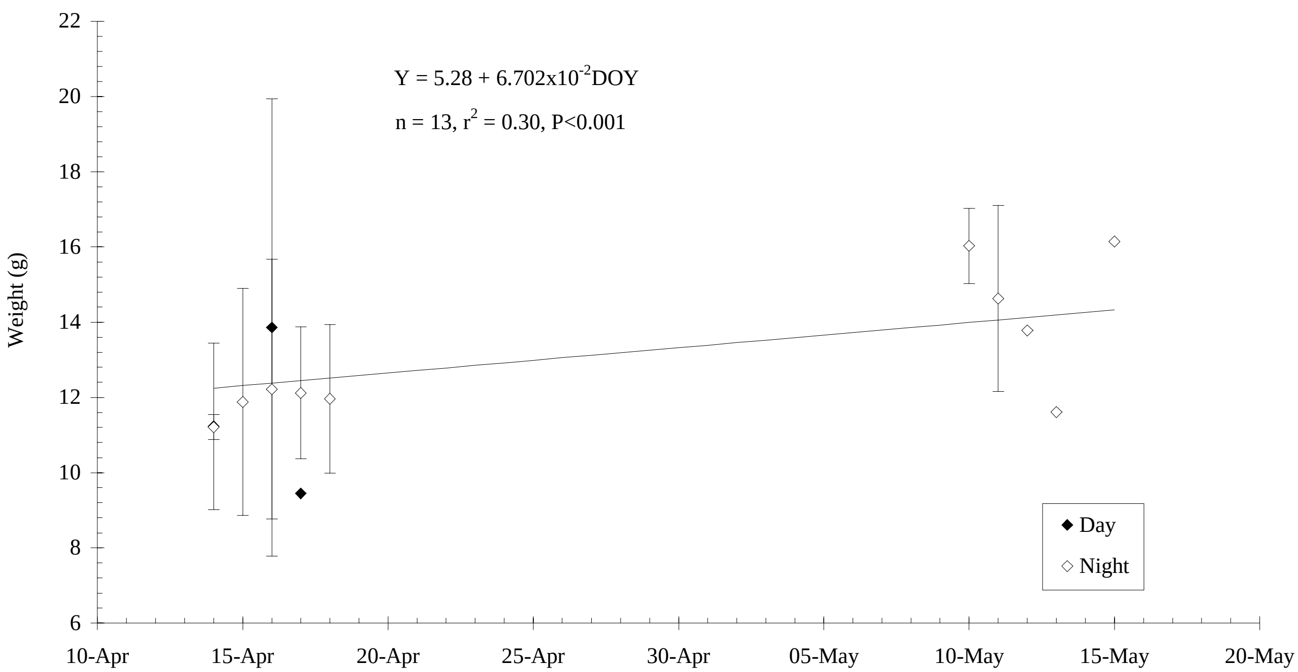


Figure 7
Mean (±1 SD) Weight-At-Date of 1+ Chinook Salmon, Nechako River, 1995: Electrofishing



weight-DOY regression was also significant-mean weight rose from 12.25 g on April 14 to 14.33 g on May 15 at a rate (±1 SE) of 0.07±0.01 g/d.

0+ and 1+ Chinook Salmon: Weight-Length Relationship

Following customary practice, a power function was used to model the relationship between weight and length of 0+ and 1+ chinook salmon:

(6a) $W = aL^b$

where a was a coefficient with units of g/mm and b was the length exponent. Equation (6a) was fit to individual weights and lengths after logarithmic transformation converted it to a linear regression:

(6b) $\log_e(W) = \log_e(a) + b\log_e(L)$.

Equation (6b) explained 96.8% of the variance in $\log_e(W)$ (Figure 8). However, it overestimated the weight of the largest fish, indicating that the weight-length relationship for juvenile chinook was not linear over the entire juvenile stage. Instead, there appeared to be one linear relationship for small 0+ fish and a second linear relationship for large 0+ fish plus all 1+ fish. The approximate $\log_e(L)$ at which the two groups diverged was 4.30 or a length of 74 mm. That average length was reached in late July and early August (see Figure 4).

0+ and 1+ Chinook Salmon: Condition

Average condition of 0+ chinook increased from a minimum of 0.68 g/mm^3 in early April to an asymptotic value of about 1.20 g/mm^3 in June (Figure 9). The average condition of 0+ chinook in mid-November was slightly lower at about 1.06 g/mm^3. Condition of 1+ chinook salmon was constant over April-May, 1995, at a mean condition similar to that of 0+ chinook captured in the fall of 1995 (Figure 10).

Diamond Island Traps

0+ Chinook Salmon: Sources of Variation

To determine if there were day-night differences in the size of 0+ chinook caught by all three types of traps at Diamond Island, standard two-factor ANOVAs of length-at-date and weight-at-date were conducted. The ANOVAs were identical in structure to those conducted on chinook caught by electrofishing. They showed that:

(1) there was highly significant variation with date of mean length ($F_{2,2786}$ = 1401.114, P<0.001) and mean weight ($F_{2,2786}$ = 1274.661, P<0.001). Figures 11 and 12 (and Appendix 2) showed that variation was due to growth;

(2) mean length ($F_{1,2786}$, P = 0.008) and mean weight ($F_{1,2786}$ = 21.465, P<0.001) of 0+ chinook salmon were significantly greater in night catches than in day catches. Mean length was 43.7 mm (SD = 5.2, n = 2128) at night compared to 43.0 mm (SD = 5.2, n = 664) during the day, and mean weight was 0.93 g (SD = 0.46, n = 2128) at night compared to 0.83 g (SD = 0.42, n = 664) during the day. These day-night differences were most likely due to the same reasons discussed above for electrofished juveniles; and

(3) the interaction of date and time of day was highly significant for both length ($F_{2,2786}$ = 35.597, P<0.001) and weight ($F_{2,2786}$ = 50.524, P<0.001). Figures 11 and 12 showed that that was due to an increase in the day-night differences in mean size in June and July compared to April and May. The day-night difference in mean length rose from 0.5 mm in April to 1.3 mm in May and then fell to -4.2 mm in June-July. The difference in mean weight rose from 0.00 g in April to 0.11 g in May and then fell to -0.52 g in June-July.

0+ Chinook Salmon: Growth

Unlike the electrofishing data, where the monthly schedule of sampling allowed a clear separation of the two growth stanzas, the size-at-date data from the Diamond Island traps showed a gradual transition between stanzas over several weeks in mid-May. To fit Gompertz growth curves to the Diamond Island data, the second stanza was defined as starting between DOY 128 and 134, based on a visual assessment of the plots of size-at-date. Gompertz curves were then fit to size-at-date for each of the seven possible starting dates and the regression that explained the most variation in size, i.e., had the highest r^2, was chosen. Starting dates of DOY = 131 and 130 were found to provide the highest r^2 for length and weight, respectively (Figures 11 and 12).

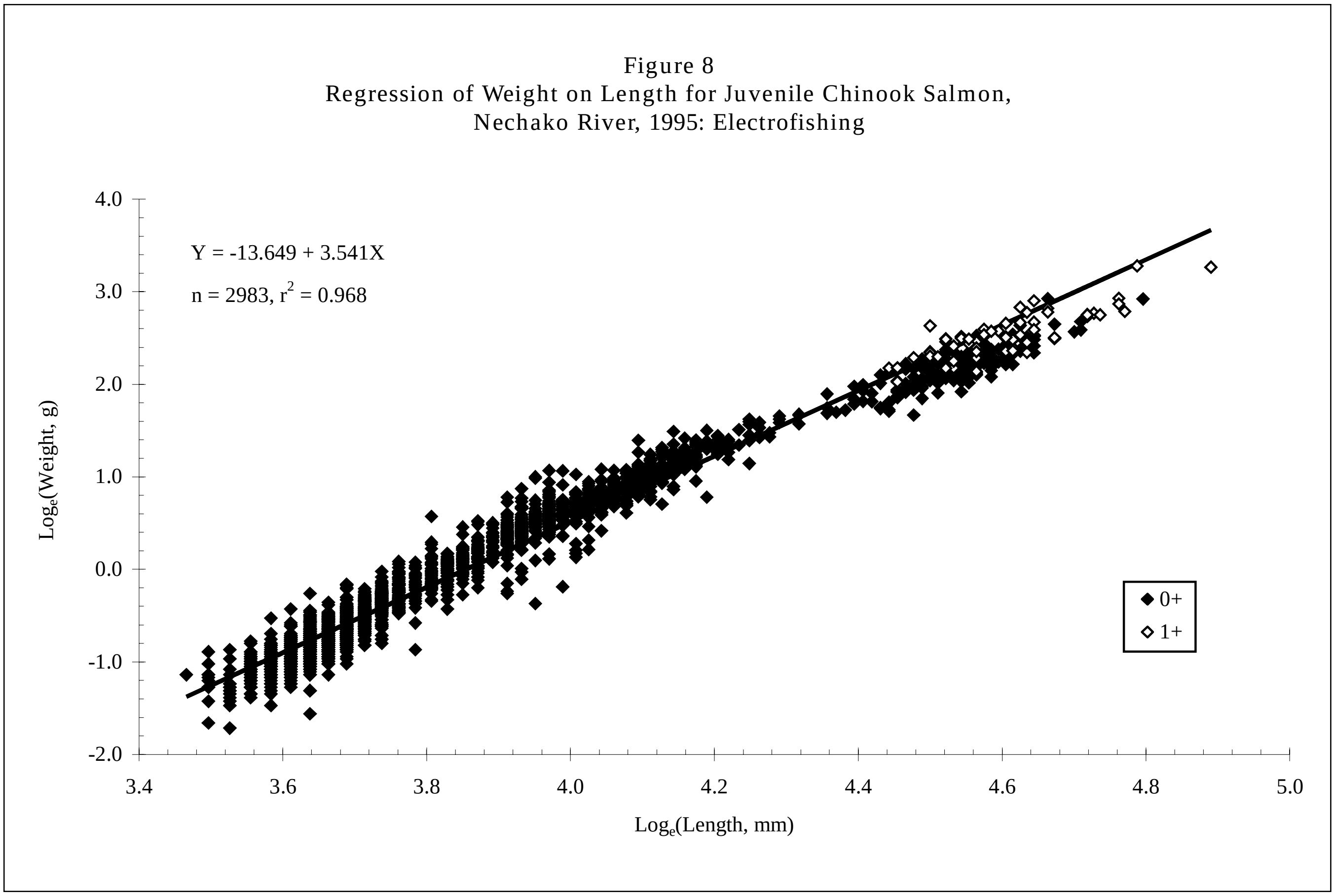


Figure 8
Regression of Weight on Length for Juvenile Chinook Salmon,
Nechako River, 1995: Electrofishing
Y = -13.649 + 3.541X
n = 2983, r^2 = 0.968
Log_e(Weight, g)
Log_e(Length, mm)
0+
1+
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
3.4
3.6
3.8
4.0
4.2
4.4
4.6
4.8
5.0

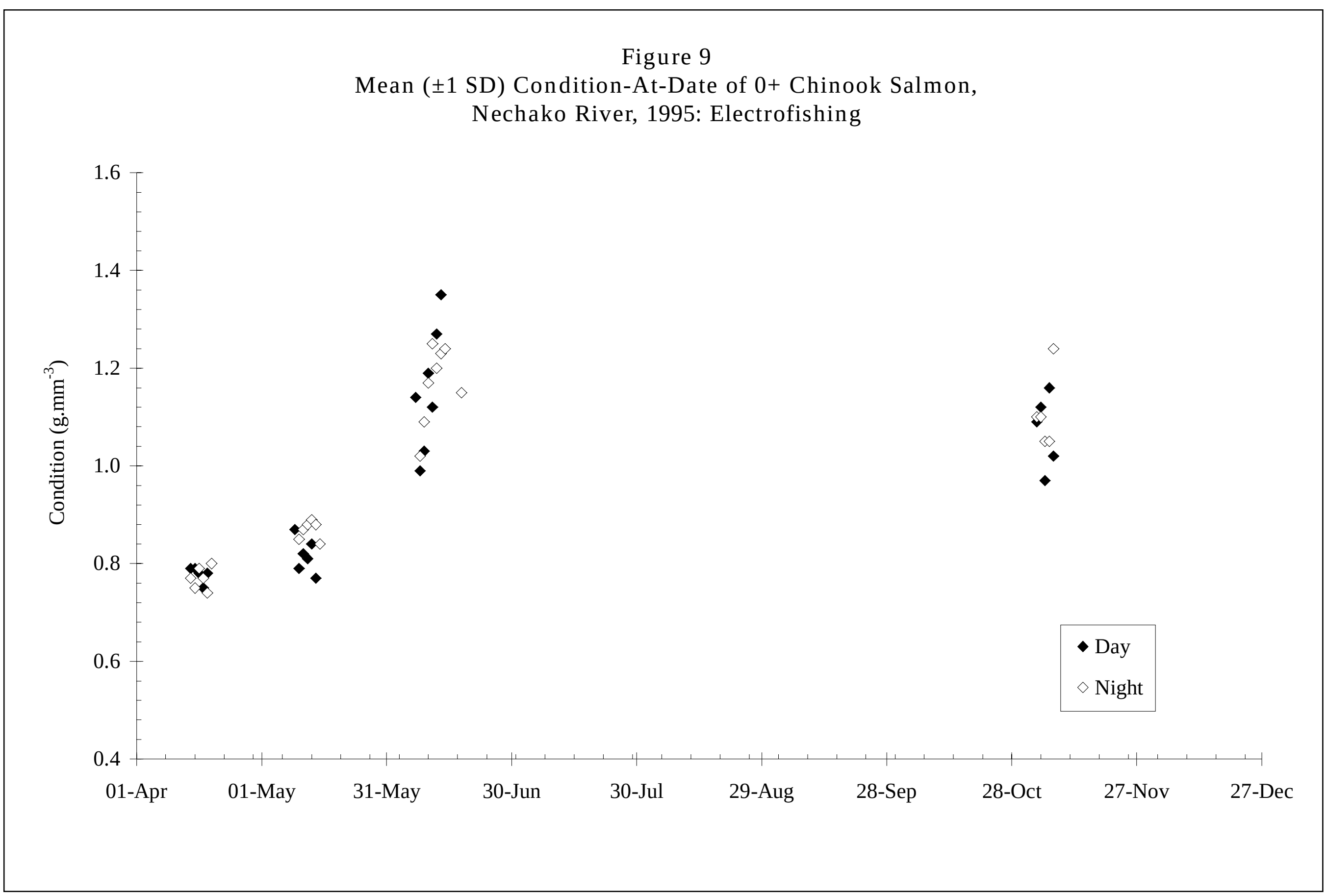


Figure 9
Mean (±1 SD) Condition-At-Date of 0+ Chinook Salmon,
Nechako River, 1995: Electrofishing
Condition ($g.mm^{-3}$)
Day
Night
1.6
1.4
1.2
1.0
0.8
0.6
0.4
01-Apr
01-May
31-May
30-Jun
30-Jul
29-Aug
28-Sep
28-Oct
27-Nov
27-Dec

Figure 10
Mean (±1 SD) Condition-At-Date of 1+ Chinook Salmon,
Nechako River, 1995: Electrofishing

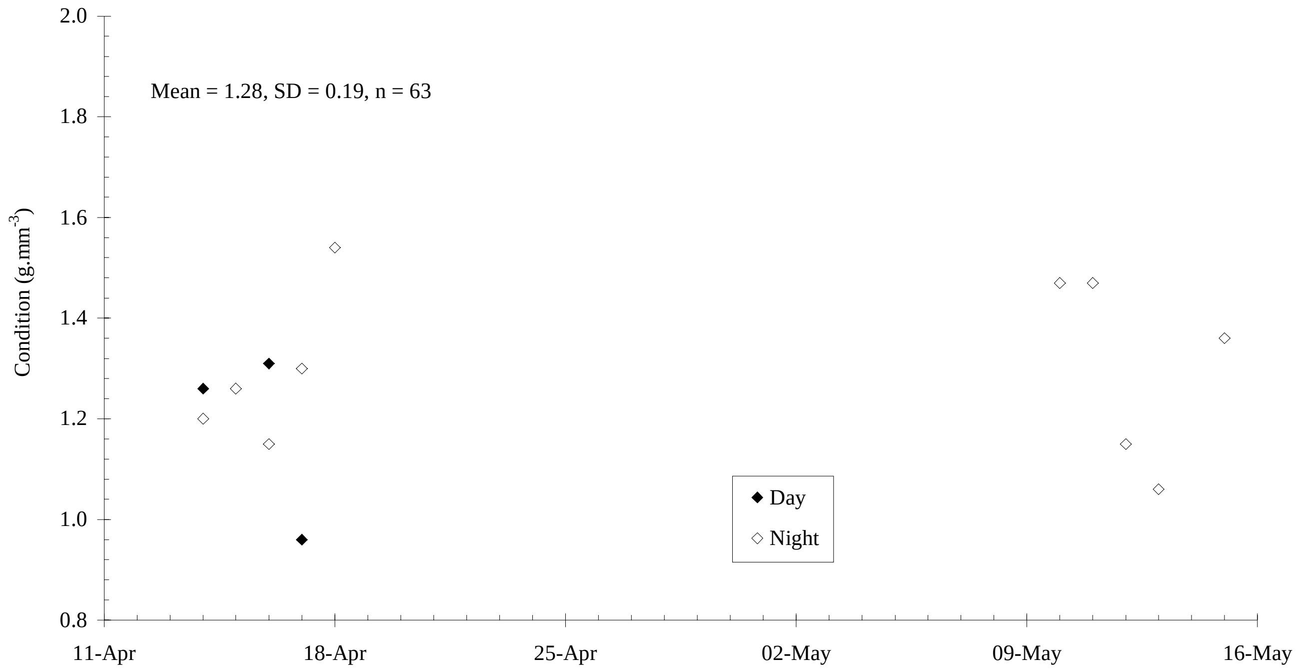


Figure 11
Mean (±1 SD) Length-At-Date of 0+ Chinook Salmon Captured in Traps
at Diamond Island, Nechako River, 1995

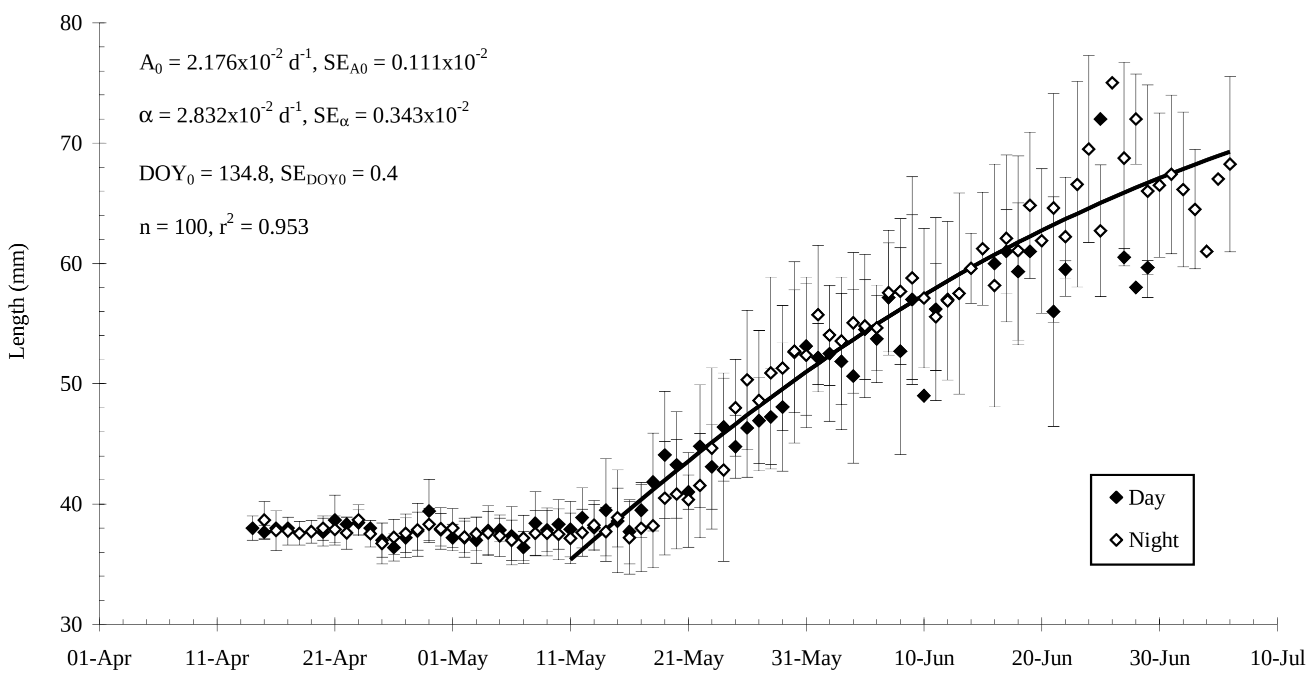
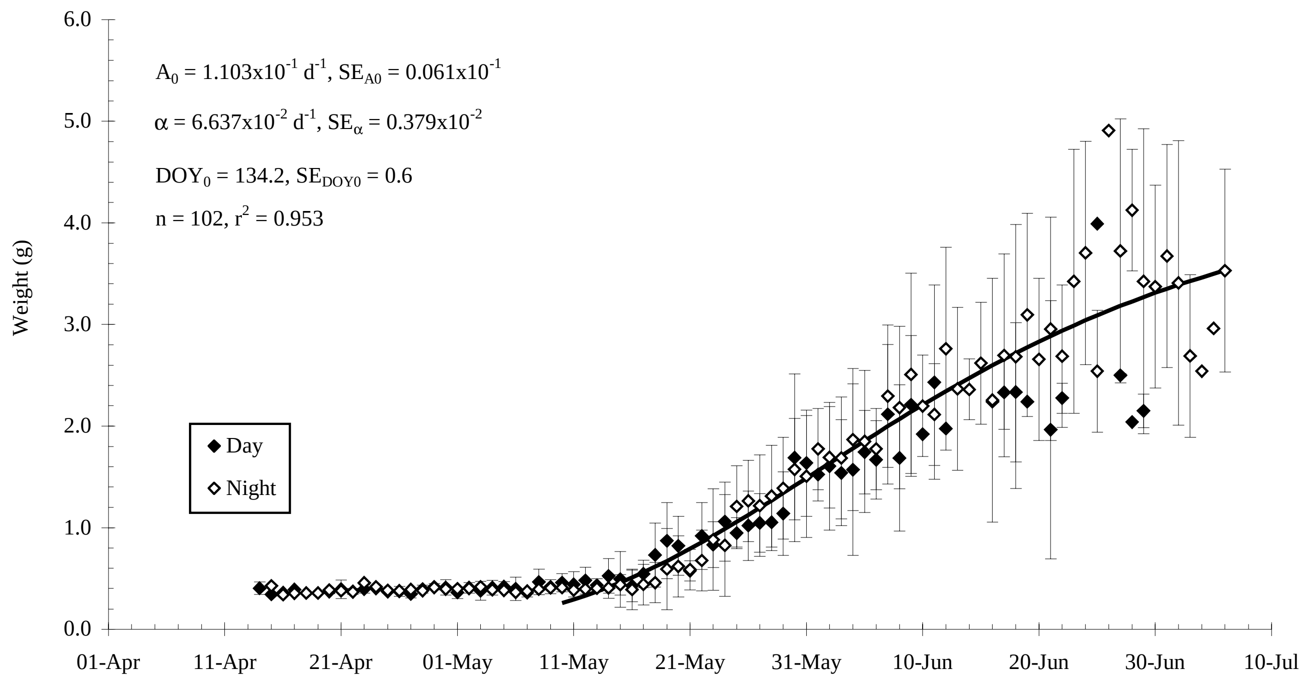


Figure 12
Mean (±1 SD) Weight-At-Date of 0+ Chinook Salmon Captured in Traps
at Diamond Island, Nechako River, 1995



1+ Chinook Salmon: Growth

A total of 93 1+ chinook salmon were captured in 1995 (Appendix 2). No growth curves were fit to their sizes-at-date because there were no significant changes of mean length with date ($F_{1,92} = 0.350$, $P = 0.555$) or of mean weight with date ($F_{1,92} = 2.734$, $P = 0.102$) (Figures 13 and 14).

0+ and 1+ Chinook Salmon: Weight-Length Relationship

A regression of weight on length for RST-caught chinook ($n = 2{,}883$, $r^2 = 0.9759$, $P<0.001$):

(7) $\log_e(W) = -13.973 + 3.607\log_e(L)$,

was almost identical to the regression for juvenile chinook salmon captured by electrofishing and so it is not shown as a figure in this report.

0+ and 1+ Chinook Salmon: Condition

The plot of mean condition-at-date of 0+ chinook salmon was similar to that shown for electrofished fish-condition increased over April and May to an asymptote in June and July (Figure 15). The asymptote lay between 0.98 and 1.80 g / mm^3. Condition of 1+ chinook was constant with date-mean condition of 1+ fish was similar to the asymptotic mean condition of 0+ chinook in summer (Figure 16).

Catches of Chinook Salmon

Electrofishing/All Species

A total of 1,057 electrofishing sweeps were made along the margins of the upper Nechako River from April to November, 1995. The average area covered by a sweep was 134 m^2 (SD = 145). A total of 73,101 fish from 12 species or families were captured (Table 1). Redsided shiner (*Richardsonius balteatus*) was the most common species and sockeye salmon (*Oncorhynchus nerka*) was the least common species. Juvenile chinook salmon was the sixth most common species, making up 8.316% by number of all fish captured.

Electrofishing/0+ Chinook

A total of 6,016 0+ chinook and 63 1+ chinook were captured by electrofishing (Table 2). Sixteen percent of 0+ chinook and 30% of 1+ chinook were taken dur-

Figure 13
Mean (±1 SD) Length-At-Date of 1+ Chinook Salmon Captured in Traps
at Diamond Island, Nechako River, 1995

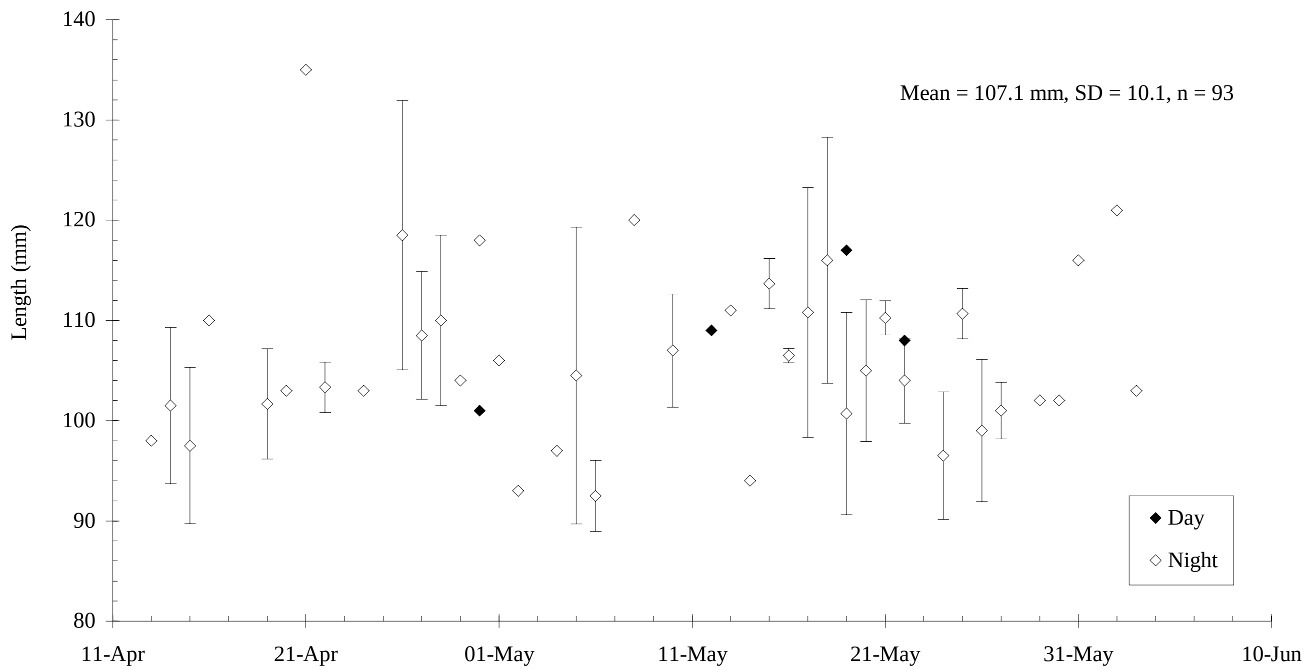


Figure 14
Mean (±1 SD) Weight-At-Date of 1+ Chinook Salmon Captured in Traps
at Diamond Island, Nechako River, 1995

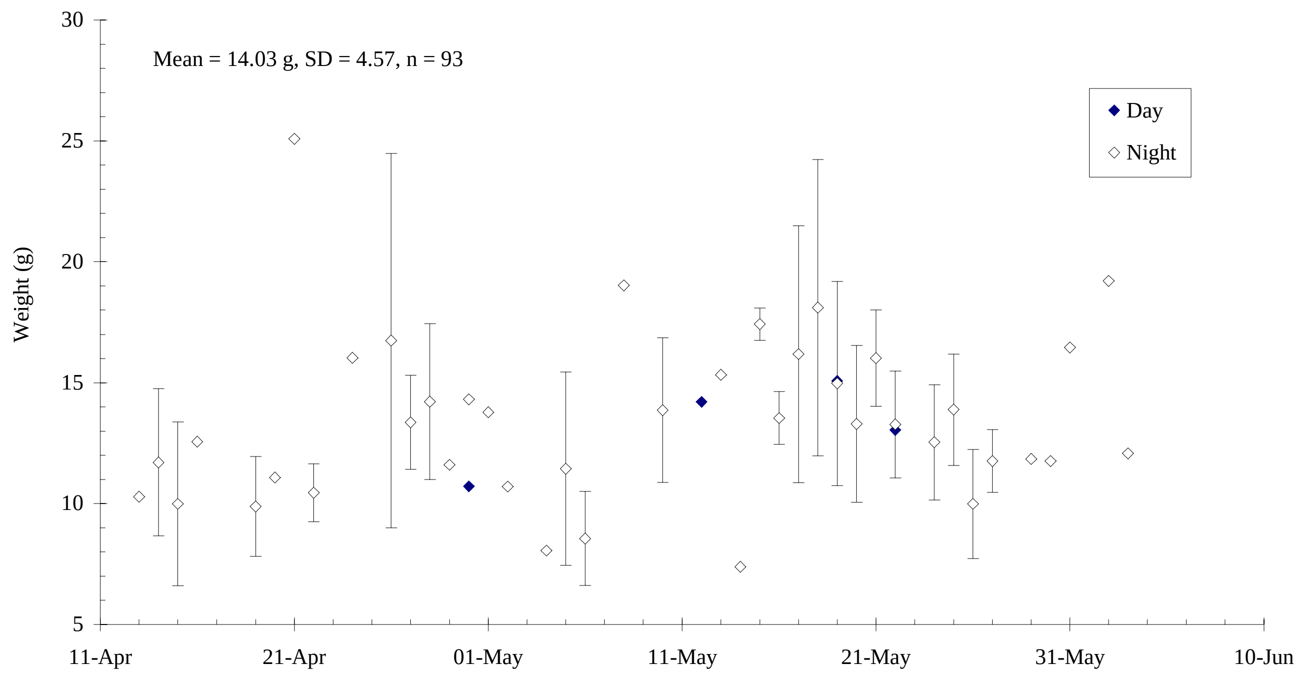


Figure 15
Mean (±1 SD) Condition-At-Date of 0+ Chinook Salmon Captured in Traps
at Diamond Island, Nechako River, 1995

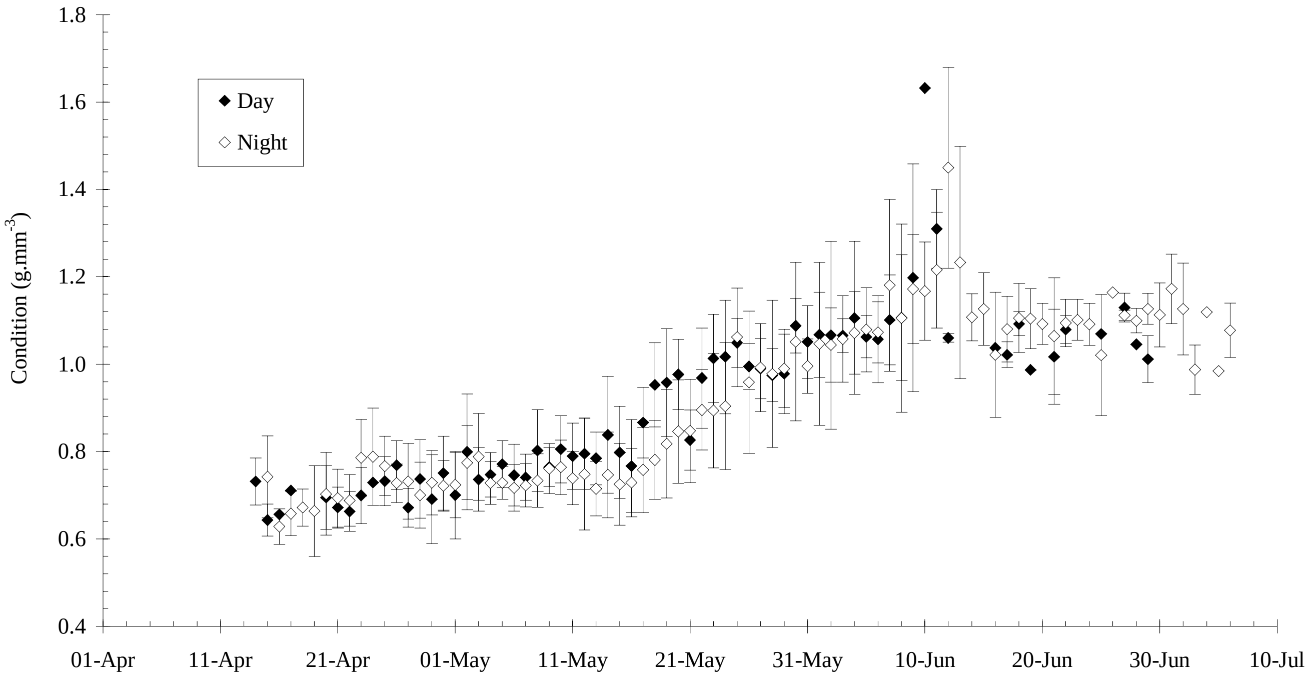


Figure 16
Mean (±1 SD) Condition-At-Date of 1+ Chinook Salmon Captured in Traps
at Diamond Island, Nechako River, 1995

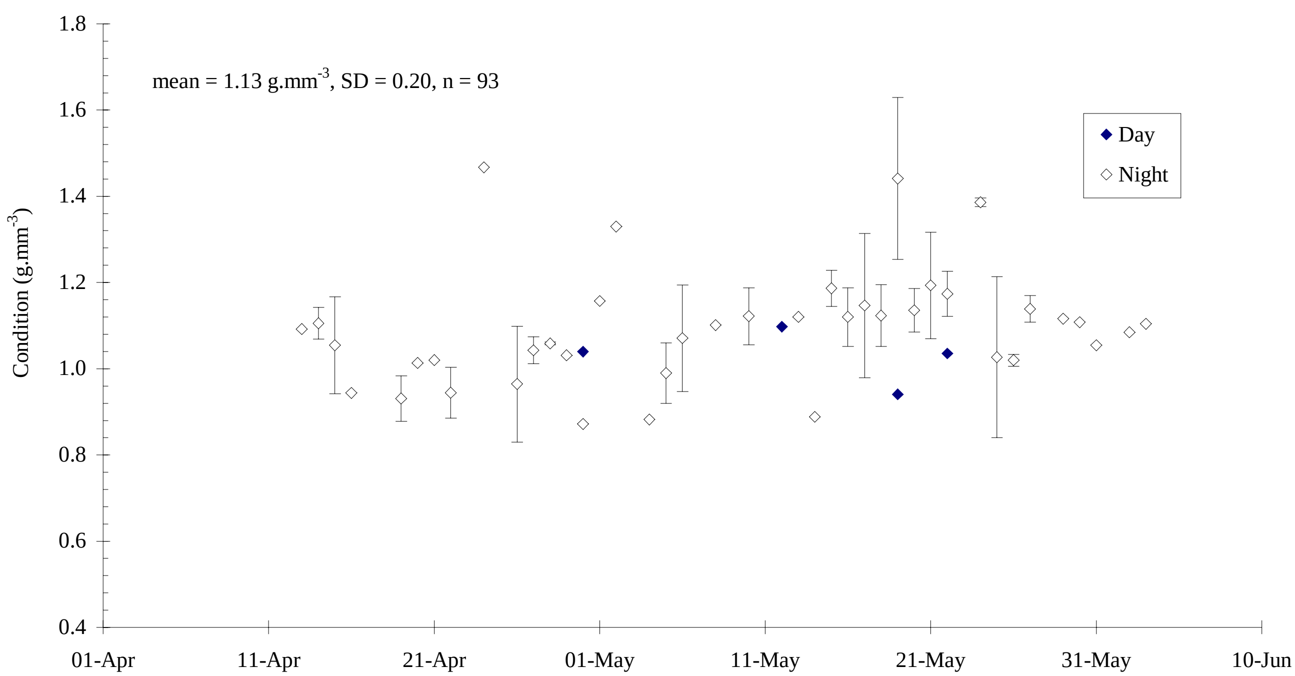


Table 1
Number of Fish Captured in the Upper Nechako River, 1995, by Electrofishing

Species	Scientific Name	Adult				Juvenile				Total			
		Day	Night	Total	Percent	Day	Night	Total	Percent	Day	Night	Total	Percent
Redsided shiner	*Richardsonius balteatus*	661	2800	3461	4.735	9071	14025	23096	31.595	9732	16825	26557	36.329
Largescale sucker	*Catostomus macrocheilus*	3	380	383	0.524	4757	6554	11311	15.473	4760	6934	11694	15.997
Northern squawfish	*Ptychocheilus oregonensis*	15	237	252	0.345	1372	7155	8527	11.665	1387	7392	8779	12.009
Longnose dace	*Rhinichthys cataractae*	349	150	499	0.683	5528	1675	7203	9.853	5877	1825	7702	10.536
Leopard dace	*Rhinichthys falcatus*	809	469	1278	1.748	3556	2822	6378	8.725	4365	3291	7656	10.473
Chinook salmon	*Oncorhynchus tshawytscha*	0	0	0	0.000	969	5110	6079	8.316	969	5110	6079	8.316
Sculpins	*Cottidae*	352	643	995	1.361	1063	1271	2334	3.193	1415	1914	3329	4.554
Rocky Mountain whitefish	*Prosopium williamsoni*	3	30	33	0.045	196	784	980	1.341	199	814	1013	1.386
Rainbow trout	*Oncorhynchus mykiss*	11	14	25	0.034	59	140	199	0.272	70	154	224	0.306
Peamouth chub	*Mylocheilus caurinus*	1	0	1	0.001	4	47	51	0.070	5	47	52	0.071
Burbot	*Lota lota*	3	3	6	0.008	2	4	6	0.008	5	7	12	0.016
Other	NA	0	0	0	0.000	0	0	0	0.000	2	1	3	0.004
Sockeye salmon	*Oncorhynchus nerka*	0	0	0	0.000	1	0	1	0.001	1	0	1	0.001
Total		2207	4726	6933	9.484	26578	39587	66165	90.512	28787	44314	73101	100.000

Table 2
Mean Monthly Electrofishing Catch-Per-Unit-Effort (CPUE) of
Juvenile Chinook Salmon in the Nechako River, 1995

	Number of fish			0+ CPUE		1+ CPUE		0+ Log_e(CPUE+1)		1+ log_e(CPUE+1)	
Date	0+	1+	n	mean	SD	mean	SD	mean	SD	mean	SD
Day											
15-Apr-95	235	19	137	1.420	1.879	0.110	0.511	0.6413	0.6711	0.0600	0.2429
11-May-95	507	0	137	2.923	6.430	0.000	0.000	0.7932	0.9309	0.0000	0.0000
10-Jun-95	145	0	137	0.638	2.448	0.000	0.000	0.2174	0.5420	0.0000	0.0000
04-Nov-95	63	0	119	0.434	0.963	0.000	0.000	0.2305	0.4488	0.0000	0.0000
sum	950	19									
Night											
16-Apr-95	279	30	137	1.666	2.703	0.183	0.654	0.6352	0.7704	0.1041	0.2984
12-May-95	2245	14	137	13.520	15.673	0.081	0.300	2.1056	1.1463	0.0552	0.1887
11-Jun-95	2427	0	137	13.185	18.392	0.000	0.000	2.0700	1.0924	0.0000	0.0000
04-Nov-95	115	0	116	0.789	1.714	0.000	0.000	0.3523	0.5823	0.0000	0.0000
sum	5066	44									
Total	6016	63									

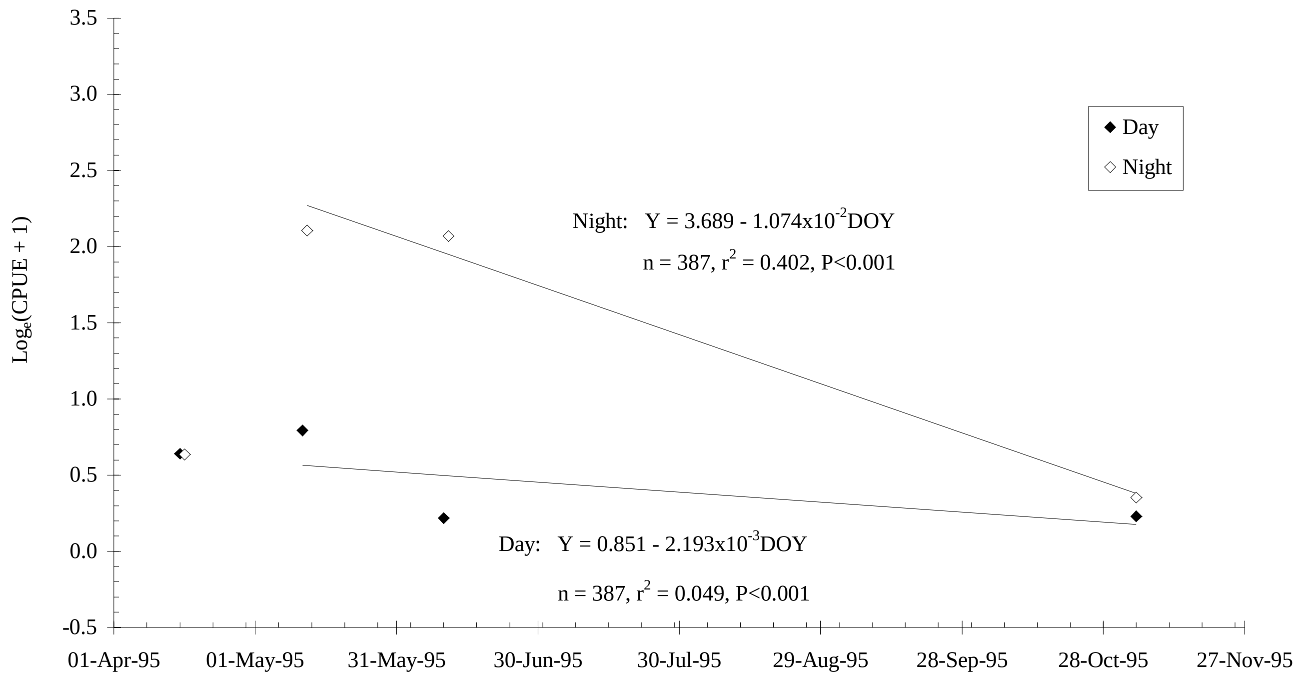
ing daylight and the rest were taken at night. Catch-per-unit-effort (CPUE) of electrofishing catches of 0+ chinook ranged from 0.00 to 111.33 fish / 100 m^2, and CPUE of 1+ chinook ranged from 0.00 to 5.83 fish / 100 m^2. The variance of mean monthly CPUE increased directly with mean monthly CPUE, indicating that CPUE was not normally distributed. The log_e(CPUE + 1) transformation was used to stabilise the variance (Sokal and Rohlf 1981).

Temporal Distribution of CPUE

Plots of mean monthly log_e(CPUE + 1) on date showed that maximum density of 0+ chinook salmon occurred in mid-May for both day and night catches (Table 2 and Figure 17). After the date of maximum density, log_e(CPUE + 1) decreased linearly with date through to November. To calculate the average rate of loss of 0+ chinook density with time, individual measurements of log_e(CPUE + 1) were regressed on day of year for day and night catches separately. Data collected in April were excluded because it fell on the ascending left-hand limb of the catch curves. The predictive regressions were highly significant (P<0.001). The percent of variance explained by the regressions did not exceed 40% because of the large variation in log_e(CPUE + 1) due to non-uniform distribution of chinook along the river.

The night-time rate of loss of log_e(CPUE + 1) of 1.07 % / d (SE = 0.07) was almost five times greater than the daytime rate of loss of 0.22 % / d (SE = 0.05) (Figure 17). The difference in rates was highly significant (t_{772} = 10.424, P<0.001). The cause of the day-night difference in loss rates was a day-night difference in mean log_e(CPUE + 1) in May and June. The reason for the day-night difference in mean log_e(CPUE + 1) was that young chinook in spring were far more vulnerable to capture at night than during day, either because they were less able to detect and avoid the gear at night than during the day or because their distribution across habitats was different between night and day. That is, fry may have sought refuge during the day in habitat that was difficult to sample, but they came out of refuge at night and were therefore caught in greater numbers. This meant that estimates of mean night log_e(CPUE + 1) in May and June were more realistic, accurate and higher than

Figure 17
Mean (±1 SD) Monthly Electrofishing Catch-Per-Unit-Effort (CPUE) of 0+ Chinook Salmon in the Nechako River, 1995



estimates of mean day $\log_e$(CPUE + 1) over the same time period. However, by October the vulnerability of chinook fry to capture was the same at night as it was during the day, either because the fish were large enough to avoid capture at night as well as they were able to avoid capture during the day or because there was less of a day-night difference in habitat choice.

The differences between the predicted $\log_e$(CPUE + 1) of day and night catches at the beginning and end of the regression period provide a range of estimates of the day-night difference in electrofishing catchability of 0+ chinook. On May 11-12, 1995, the night-day difference was 1.3124 (= 2.1056 - 0.7932), which means that night electrofishing caught an average of 3.72 times (= exp(1.3124)) more 0+ chinook than day electrofishing. On November 4, 1995, night electrofishing caught an average of 1.13 times (= exp(0.3523 - 0.2305)) more 0+ chinook than day electrofishing.

Spatial Distribution of CPUE

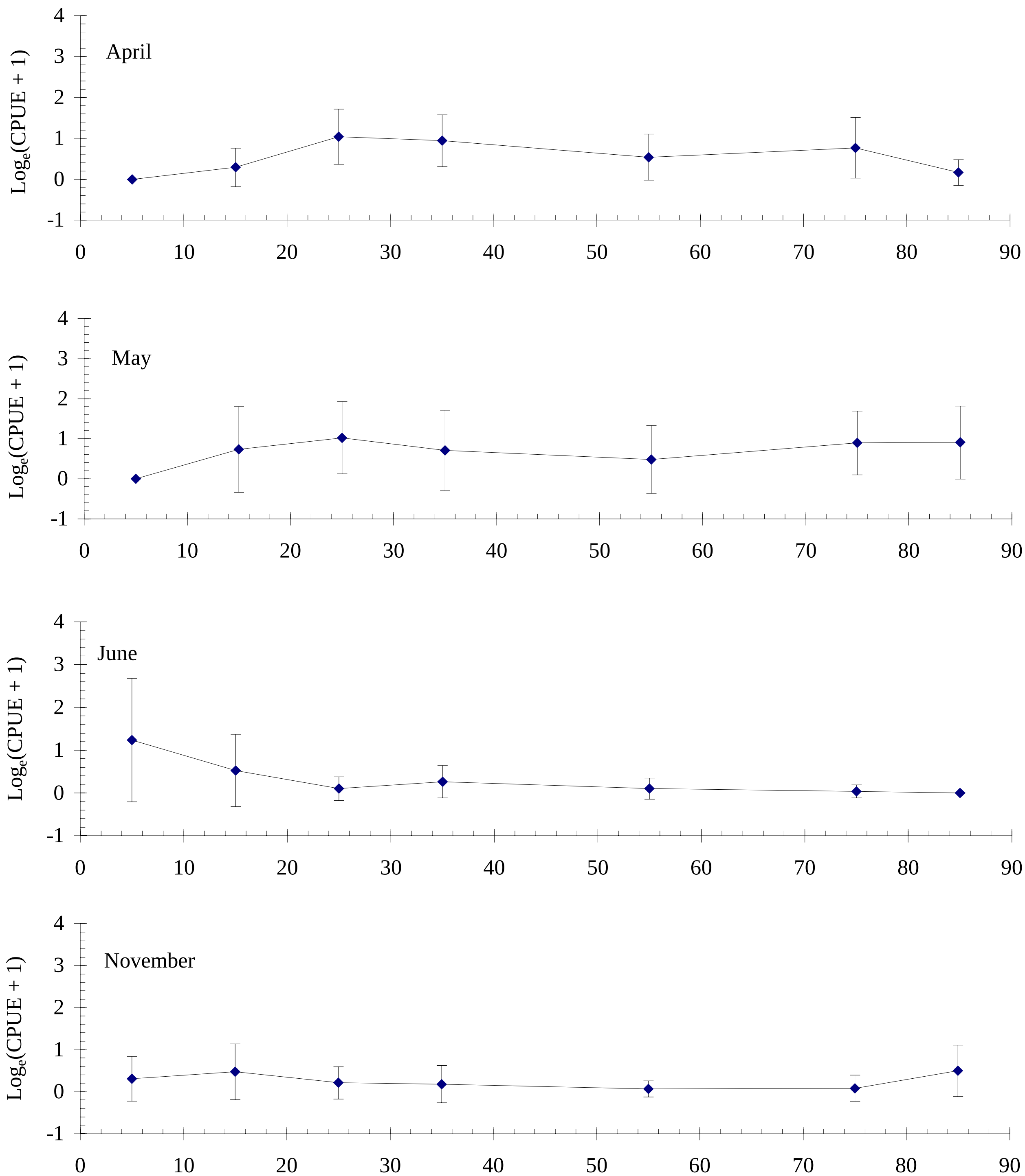
Figures 18 and 19 and Appendix 3 show the monthly distribution of mean $\log_e$(CPUE + 1) of 0+ chinook salmon over the upper 100 km of the Nechako River, aggregated into 10 km intervals.

In April, day sampling showed that the greatest CPUE of 0+ chinook was 20.0-29.9 km from Kenney Dam, while the lowest CPUE was measured 0.0-9.9 km from the Dam (or within the first kilometer of reach 1 because reach 1 started 9.0 km from the Dam). A second peak of high CPUE was observed in the 70-79.9 km interval. This pattern reflected the spatial distribution of spawning in the upper Nechako River.

Night sampling in April also showed zero CPUE within the first kilometer of reach 1 (that is, within the first 10 km distance interval from the Dam) and peak CPUE 20.0-29.9 km downstream of the Dam, as well as a secondary peak of CPUE 70.0-79.9 km downstream of the Dam.

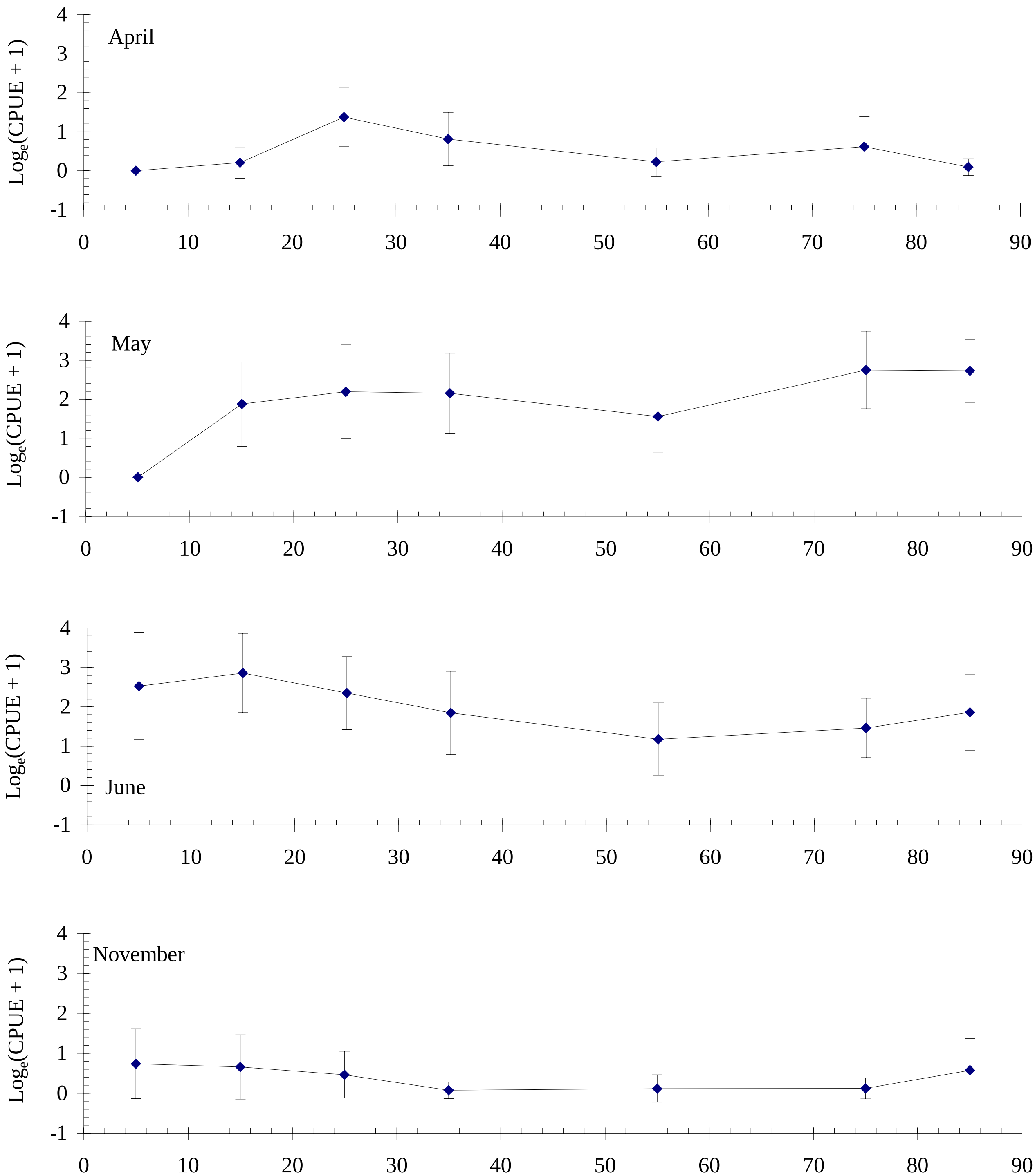
In May, the bimodal distribution of CPUE was still apparent in both day and night sampling. The second, downstream peak of CPUE increased in magnitude until it was equal to the upstream peak in day catches and greater than the upstream peak in night

Figure 18
Mean (±1 SD) Monthly Catch-Per-Unit-Effort (CPUE) of 0+ Chinook Salmon
in the Upper Nechako River, 1995: Electrofishing (day)



Distance (km) from Kenney Dam

Figure 19
Mean (±1 SD) Monthly Catch-Per-Unit-Effort (CPUE) of 0+ Chinook Salmon
in the Upper Nechako River, 1995: Electrofishing (night)



Distance (km) from Kenney Dam

catches. There was a slight increase in density of 0+ chinook in the 10-19.9 km interval (greater in night catches than day catches). Both of the changes since April were due to colonisation of upstream habitat by juveniles that had emerged further downstream. The upstream movement of fry was particularly evident in the night catches.

By June, the upstream peak had moved much closer to the Dam-the greatest densities were recorded within the first kilometer of reach 1. There was no evidence of a second downstream peak in the day catches, but its presence was apparent in the night catches.

By November, the 0+ chinook remaining in the river had redistributed themselves roughly evenly along the length of the river.

To quantify these observations, the monthly x-centroid, x_m (km), or weighted center of distribution of 0+ chinook along the longitudinal (x-axis) of the river, was calculated as:

(8) $$xm = \Sigma (CPUE_i.x_i) / \Sigma\ CPUE_i$$

where $CPUE_i$ = CPUE at site i, and x_i = longitudinal distance (km) from Kenney Dam to site i. The centroids confirmed the upstream migration of juvenile chinook towards Kenney Dam between May and June followed by downstream movement in fall as resident fish searched for overwintering habitat (Table 3).

Electrofishing/1+ Chinook

CPUE of 1+ chinook salmon decreased so rapidly with date that most, if not all, 1+ fish had left the upper Nechako River by the end of May (Table 2). Greater numbers of 1+ fish were caught at night than during the day. There were too few data to calculate an average rate of loss of 1+ chinook by regressing mean monthly $\log_e$(CPUE + 1) against date. Instead, a total instantaneous loss rate of night catches of 0.19 %/d over April and May was calculated as:

(9) $$\text{loss rate} = -[100 / (t_{i+1} - t_i)][\log_e(CPUE + 1)_{i+1} - \log_e(CPUE + 1)_i],$$

Table 3
Centroids of Juvenile Chinook Salmon Along the Longitudinal Axis of the Nechako River, 1995

Date	Centroid (km) 0+	1+
Day		
15-Apr-95	37.1	32.9
11-May-95	38.0	-
10-Jun-95	15.6	-
04-Nov-95	46.6	-
Night		
16-Apr-95	32.0	37.6
12-May-95	46.0	24.0
11-Jun-95	28.1	-
04-Nov-95	40.8	-

where t_i = mid-date of month i, and t_{i+1} = mid-date of the following month.

Electrofishing CPUE for 1+ chinook showed that these fish also tended to concentrate in the upper river in April and May (Figure 20). The centroids of 1+ chinook were all in reach 2 (Table 3).

Diamond Island Traps

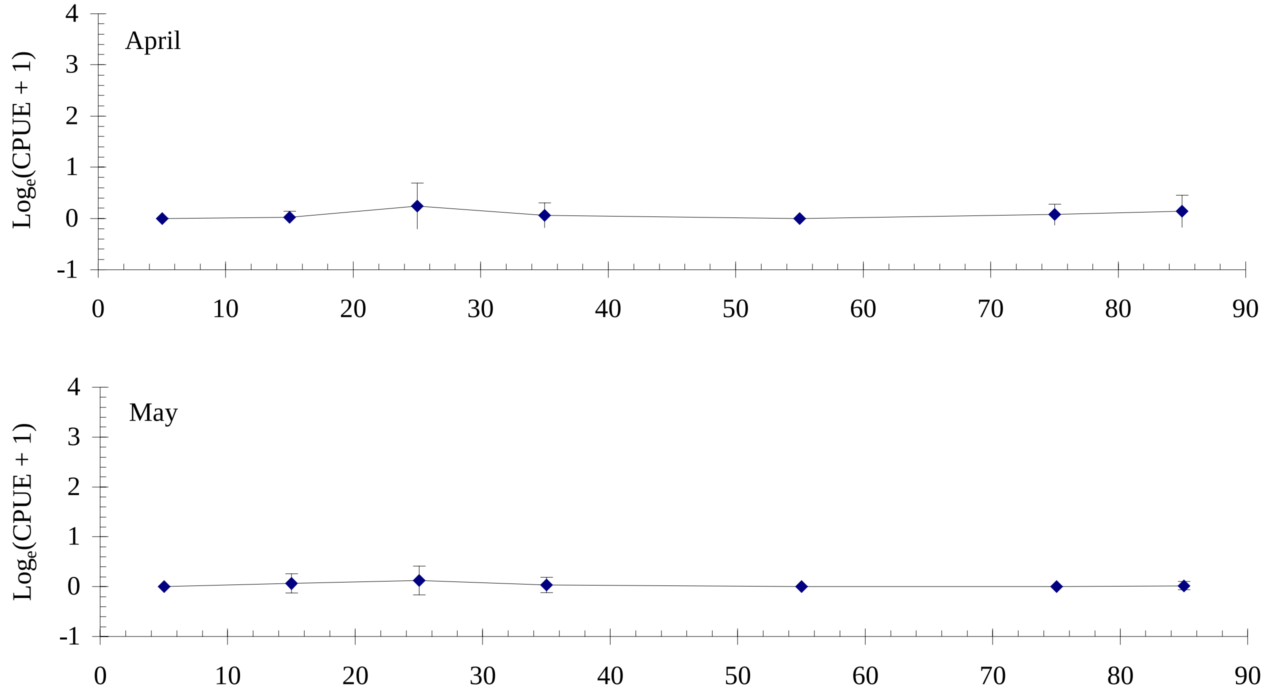
A total of 5,770 juvenile chinook salmon were caught by traps at Diamond Island in 1995, of which 2,660 (46.1%) were caught in the three RSTs, 1,426 (24.7%) were caught by the three fyke nets, and 1,684 (29.2%) were caught in the IPT (Table 4). Over 98% of these juveniles were 0+ fish. All of the 94 1+ chinook were caught by RSTs.

Methods of Analysis

As stated above in sections, all analyses of fyke net catches and IPT catches presented below were carried out on the numbers only-no adjustments were made for variation in flow through the traps. In contrast, all analyses of RST catches were based on catches expanded by the ratio of river flow to trap flow according to equation (2).

The frequency distributions of catches of juvenile chinook salmon at Diamond Island were highly non-

Figure 20
Spatial Distribution of 1+ Chinook Salmon in the Upper Nechako River, 1995: Electrofishing



Distance (km) from Kenney Dam

Table 4
Numbers of Juvenile Chinook Salmon Caught in Traps
at Diamond Island, Nechako River, 1995

Trap Type	Trap Number	Chinook 0+ Day	Chinook 0+ Night	Chinook 0+ Total	Chinook 1+ Day	Chinook 1+ Night	Chinook 1+ Total	Total
Fyke	1	3	89	92	0	0	0	92
	2	17	332	349	0	0	0	349
	3	57	928	985	0	0	0	985
	total	77	1349	1426	0	0	0	1426
IPT	0	117	1567	1684	0	0	0	1684
RST	1	103	560	663	0	17	17	680
	2	92	655	747	4	64	68	815
	3	414	742	1156	0	9	9	1165
	total	609	1957	2566	4	90	94	2660
Total		803	4873	5676	4	90	94	5770

normal, which meant that they required $\log_e$-transformation before analysis. However, the $\log_e$(number) transformation, rather than the $\log_e$(number + 1) transformation, was used for fyke net, IPT and RST catches because the population expansion procedure that was applied to RST catches effectively divided catches into two clusters of data: zero catches and non-zero catches. Non-zero catches were expanded by a factor of about 100 because most RSTs sampled about 1% of the daily flow of the river past Diamond Island, but zero catches were expanded to population estimates of zero-in effect they were not expanded at all. To avoid the problem of combining two separate clusters of data, all zero catches of all Diamond Island traps were excluded from the analyses presented below.

Fyke Net Catches

To determine which factors were responsible for changes in fyke net catches, a standard three-way ANOVA of $\log_e$(number) with fyke net (three classes: fyke nets 1, 2 and 3), time of day (two classes: day and night), and date (two classes: April and May) was conducted. It showed that there were highly significant effects of time of day ($F_{1,110}$ = 33.637, P<0.001) and of net number ($F_{2,110}$ = 7.787, P<0.001), but no significant effects (P>0.05) of date or the interactions of date, time of day and net number (Table 4 and Figure 21). The effect of time of day was due to greater catches at night than during the day, presumably due to greater net avoidance during the day than at night. The effect of net number was due to greater catches in net 3 than in net 2, and greater catches in net 2 than in net 1, for both night and day. In short, catches increased as one moved away from the shallow margins of the river and towards the river channel.

Night catches showed a distinct dome-shaped relationship with date-catches rose to a peak in early May and then decreased to zero by the end of May. (The ANOVA did not detect a date effect because the selection of date categories fortuitously corresponded to bisecting the catch curve.) The increase in catches over April was due to continuous recruitment of newly-emerged fry to the traps. The decrease over May was due to three factors: (a) avoidance of the traps by juveniles; (b) a shift in preferred habitat from the margins of the river, where the fyke nets were placed, towards the mid-channel where there were no fyke nets; and (c) natural mortality.

In summary, fyke net catches showed that a significant portion of the total population of 0+ chinook salmon moved down the left margin of the Nechako River at Diamond Island. That finding supported the assumption that the wing placed between RST 3 and the left margin of the river in 1991 was directing fish into RST 3.

Inclined Plane Trap Catches

IPT numbers showed many of the same patterns seen in fyke net numbers (Figure 22). Substantially more fish were caught at night than during the day due to daytime net avoidance and to day-night differences in the distribution of fish over habitat types (i.e., greater numbers of juveniles migrating downstream at night than during the day). Peak IPT catches occurred in mid-May and then rapidly decreased to zero before the end of the third week in June. Those results supported the findings of the fyke net catches. That is, substantial numbers of 0+ chinook salmon migrated along the left margin of the Nechako River in 1995.

<u>Diamond Island Rotary Screw Traps / 0+ Chinook</u>

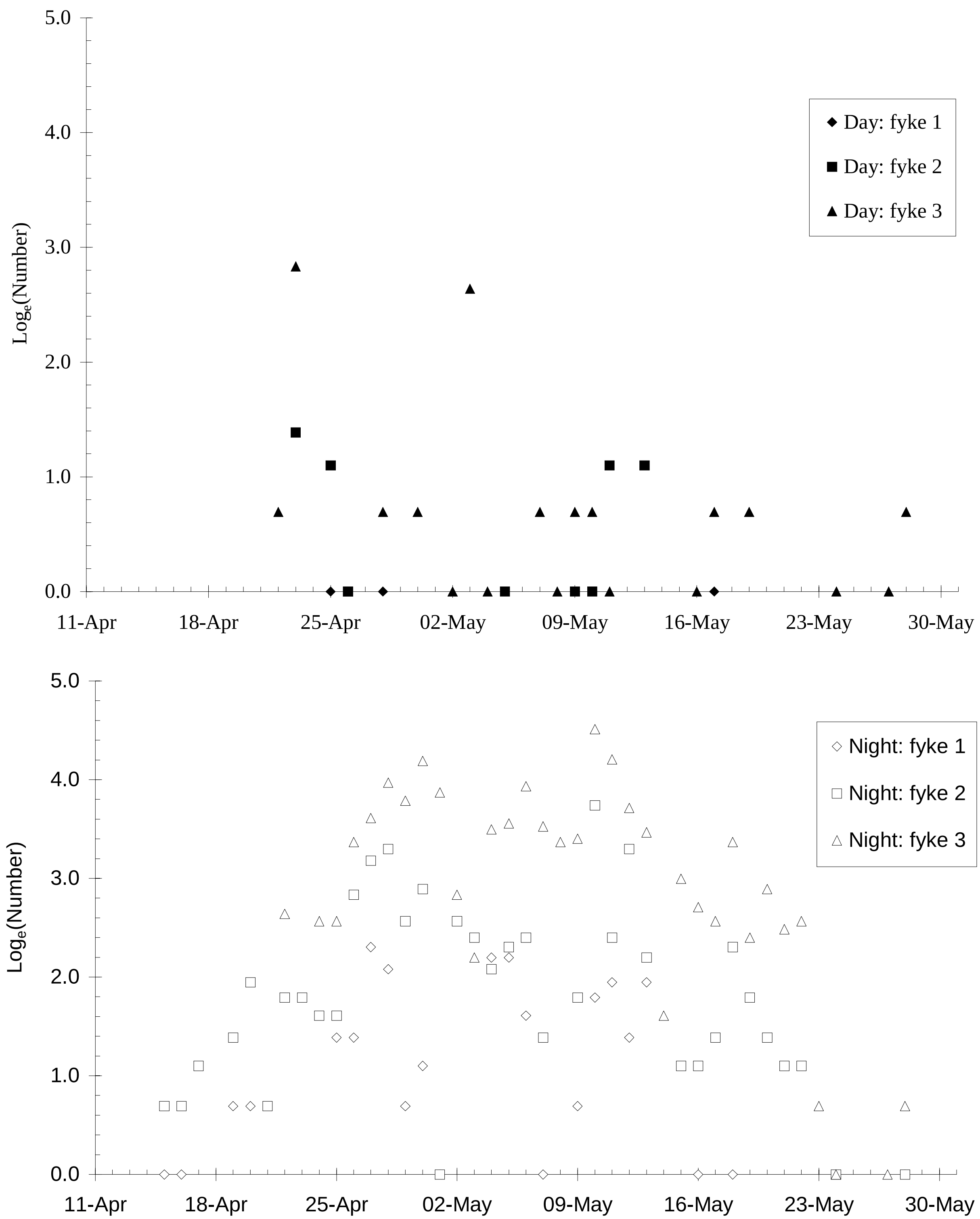
Temporal Variance of Estimated Number

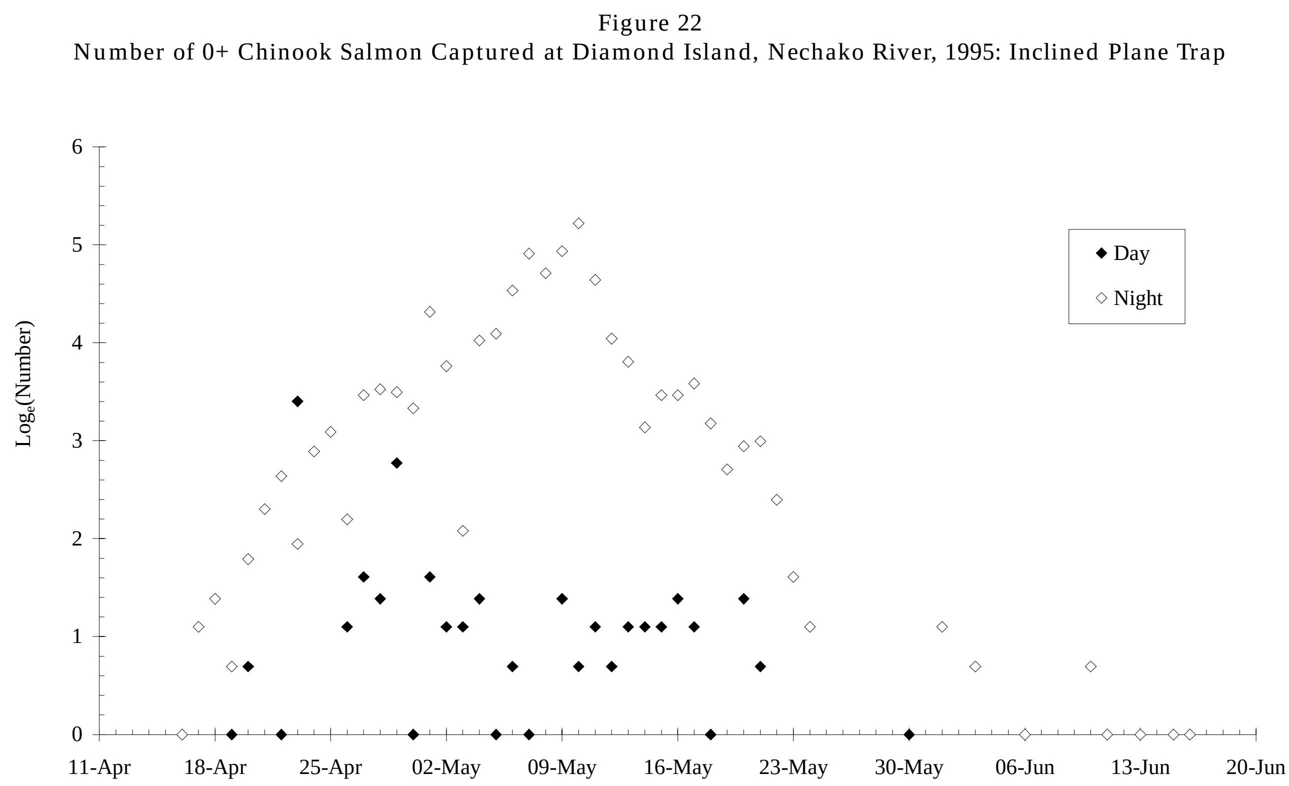
To determine which factors were responsible for changes in volume-adjusted numbers of 0+ chinook salmon caught in rotary screw traps, a standard three-way ANOVA of $\log_e$(number) on RST (three classes corresponding to the three traps), date (three classes: April, May and June-July), and time of day (two classes: day and night), was conducted. There were highly significant differences in $\log_e$(number) among traps ($F_{2,315}$ = 11.188, P<0.001), among dates ($F_{2,315}$ = 27.758, P<0.001), and between day and night ($F_{1,315}$ = 26.527, P<0.001), but there were no significant (P>0.05) interactions of trap number, date and time of day.

The trap effect was due to significantly lower mean $\log_e$(number of fish) caught by RST 1 (mean = 1.078, SD = 1.079, n = 107) than were caught by RST 2 (mean = 1.447, SD = 1.077, n = 103) and RST 3 (mean = 1.738, SD = 1.066, n = 123). That indicated that more 0+ juveniles used the right margin of the river at Diamond Island than the left margin.

The date effect was due to variation in catch rates over the April to July period caused by recruitment of ju-

Figure 21
Number of 0+ Chinook Salmon Captured at Diamond Island, Nechako River, 1995: Fyke Nets





veniles to the traps over April and subsequent loss of juveniles over May to July due to a combination of downstream dispersal, natural mortality, and changes in the catchability of the traps as chinook fry grew in size and increased their ability to avoid capture (Figures 23 and 24).

The time effect was caused by substantially greater catches at night than during the day due to a preference for night-time movement and to avoidance of traps during the day (Figures 23 and 24).

The lack of any interactions between the three factors indicated that the shapes of the catch curves were similar among traps.

The catch curves for the weighted average volume-expanded numbers showed the typical three-part dome-shaped pattern observed in previous years. There was an initial period of increasing catches in April as juveniles were recruited to Diamond Island from upstream emergence sites. Catches reached a peak in early- to late-May, and then decreased over June and July due to a combination of downstream dispersal, natural mortality, and changes in the catchability of the traps. One unexplained aspect of both the day and night catch curves was a brief period of reduced catches in mid-May.

To estimate the time rates of loss from the traps, regressions of log$_e$(weighted average number) on day of year (DOY) were fit to the declining right-hand limb of the catch curves for day and night separately. May 10 (DOY = 130) was chosen as the peak of the two catch curves and the beginning date of the regression period. The instantaneous rate of loss for day catches was 5.62 %/d (SE = 0.71) with 95% confidence limits of 4.18 to 7.06 %/d. The rate of loss for night catches was 4.62 %/d (SE = 0.69) with 95% confidence limits of 3.25 to 6.00 %/d. The rates were 4.3 to 25.5 times higher than the loss rates estimated from electrofishing catches.

The night-day difference in predicted log$_e$(number) over the regression period increased from 2.17 (= exp(6.881 - 6.104)) on May 10 (DOY = 130) to 3.60 (= exp(4.570 - 3.289)) on June 29 (DOY = 180). The increase was most likely caused by an increase in daytime trap avoidance due to increasing sizes of juvenile chinook over May to July.

Figure 23
Number of 0+ Chinook Salmon Passing Diamond Island, Nechako River, 1995,
as Estimated by Rotary Screw Traps (day)

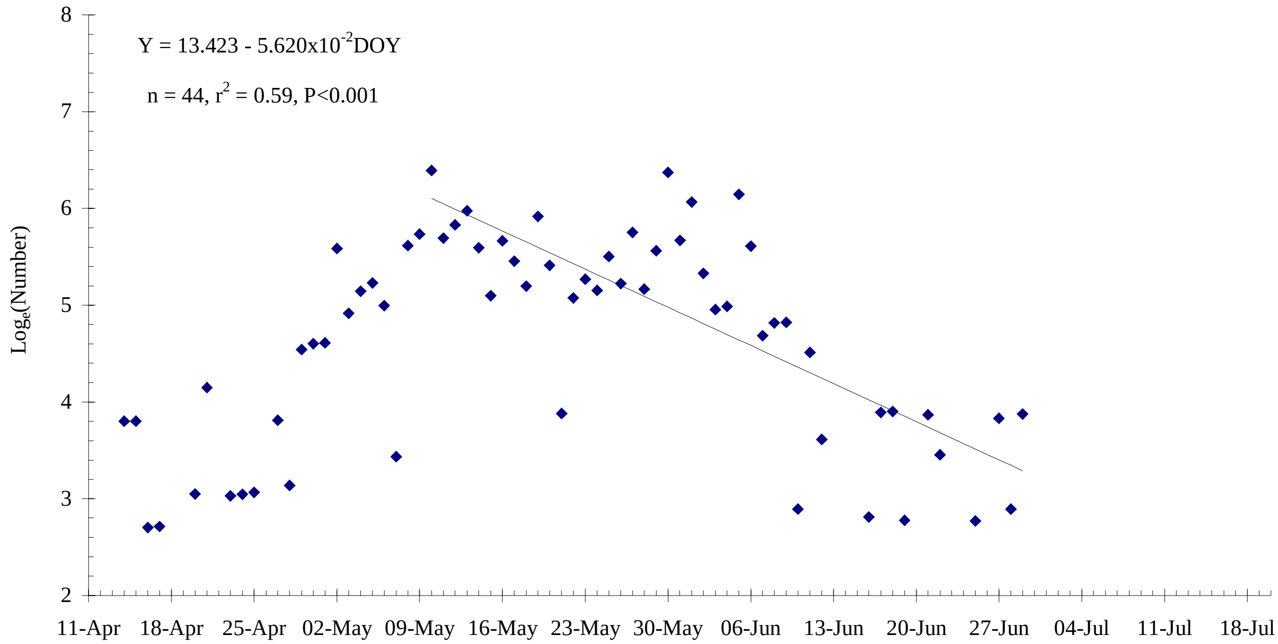
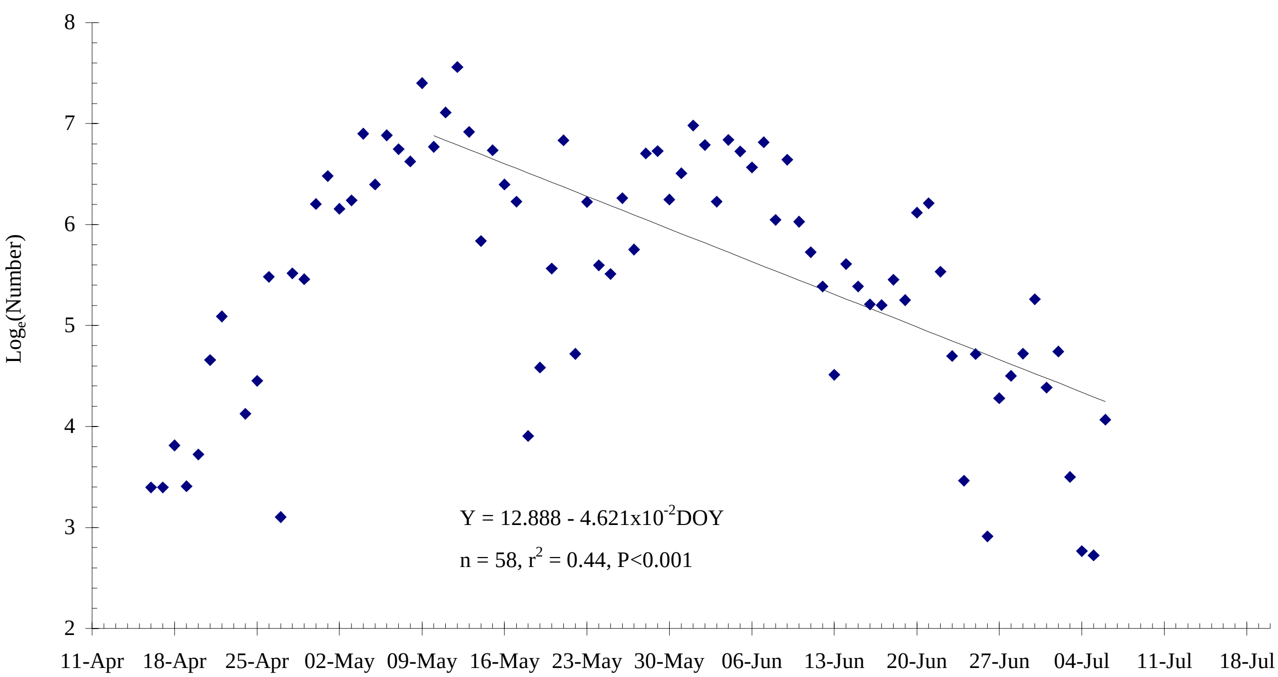


Figure 24
Number of 0+ Chinook Salmon Passing Diamond Island, Nechako River, 1995,
as Estimated by Rotary Screw Traps (night)



A total of 2,563 0+ chinook salmon were caught at the rotary screw traps in 1995 (Appendix 4). Summing the volume-expanded number of 0+ chinook that were estimated to have passed Diamond Island over the study period produced totals ranging from 34,906 for trap 2 to 57,868 for trap 3 (Appendix 4). The total index number of 0+ chinook that passed Diamond Island, weighted by the average percent of river flow filtered by each trap, was 45,025.

That was the smallest number of outmigrating 0+ chinook that has been estimated over the last 6 years (Table 6). However, it was only 5.4% less than the number of outmigrants estimated for 1994. It should be noted that rotary screw trap catches in 1994 and 1995 were restricted to the spring and early summer, whereas catches in 1991 to 1993 included samples taken in September, October and November.

The number of outmigrating 0+ chinook was not significantly correlated with the number of parents that spawned upstream of Diamond Island (Figure 25), however, there is a positive relationship indicated between the two variables. The lack of significance of the correlation is due to the low sample size-only four years of data.

Diamond Island Rotary Screw Traps/1+ Chinook

All analysis of 1+ chinook salmon was restricted to the rotary screw trap data because no 1+ chinook were caught in fyke nets or the IPT. There were no obvious temporal trends of $\log_e$(number) with date, so the data were not plotted. Mean $\log_e$(number) was greater at night (mean = 3.427, SD = 0.612, n = 41) than during the day (mean = 2.858, SD = 0.103, n = 4).

A total of 94 1+ chinook were captured in the rotary screw traps which, when expanded by the percentage of river flow sampled by the traps, was equivalent to an index total of 1,660 chinook that passed Diamond Island in 1995 (Appendix 4).

Diamond Island Rotary Screw Traps/Other Fishes

A total of 7,643 fish from 13 species or families were captured by the rotary screw traps in 1995 (Table 5). Chinook salmon was the most common species, making up 34.80% of all fish. The three most common non-salmonid fishes were redsided shiner, largescale sucker and northern squawfish. The least common fish was the burbot-only 4 were caught in 1995.

Figure 25
Plot of the Number of 0+ Chinook Salmon Outmigrants on the Number of Parent Spawners Above Diamond Island, Nechako River

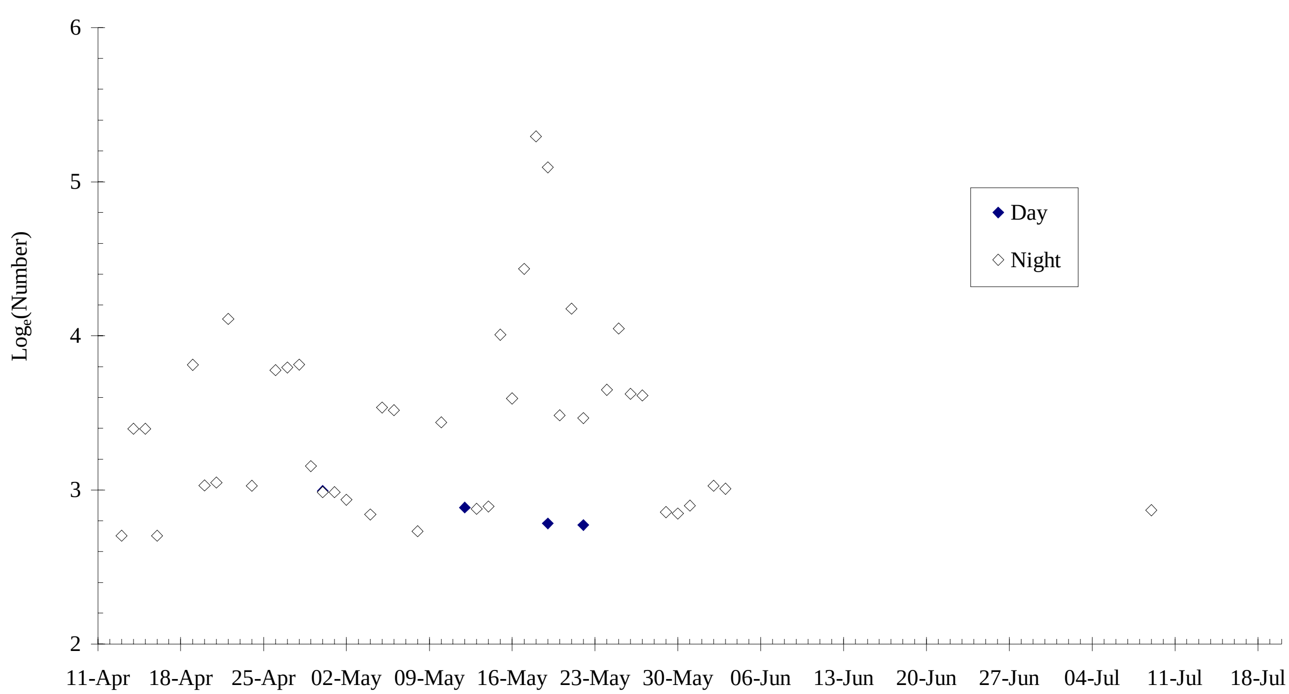


Table 5
Number of Fish Captured at Diamond Island, Nechako River, 1995, by Rotary Screw Traps

		Adult				Juvenile				Total			
Species	Scientific name	Day	Night	Total	Percent	Day	Night	Total	Percent	Day	Night	Total	Percent
Chinook salmon	*Oncorhynchus tshawytscha*	0	0	0	0.00	613	2047	2660	34.80	613	2047	2660	34.80
Redsided shiner	*Richardsonius balteatus*	34	927	961	12.57	81	493	574	7.51	115	1420	1535	20.08
Largescale sucker	*Catostomus macrocheilus*	5	137	142	1.86	124	901	1025	13.41	129	1038	1167	15.27
Northern squawfish	*Ptychocheilus oregonensis*	3	48	51	0.67	23	978	1001	13.10	26	1026	1052	13.76
Leopard dace	*Rhinichthys falcatus*	32	273	305	3.99	32	138	170	2.22	64	411	475	6.21
Rocky Mountain whitefish	*Prosopium williamsoni*	0	2	2	0.03	51	381	432	5.65	51	383	434	5.68
Sockeye salmon	*Oncorhynchus nerka*	0	0	0	0.00	41	124	165	2.16	41	124	165	2.16
Longnose dace	*Rhinichthys cataractae*	3	50	53	0.69	1	37	38	0.50	4	87	91	1.19
Sculpins	*Cottidae*	2	7	9	0.12	0	27	27	0.35	2	34	36	0.47
Rainbow trout	*Oncorhynchus mykiss*	1	6	7	0.09	0	8	8	0.10	1	14	15	0.20
Peamouth chub	*Mylocheilus caurinus*	0	0	0	0.00	1	8	9	0.12	1	8	9	0.12
Burbot	*Lota lota*	0	0	0	0.00	0	4	4	0.05	0	4	4	0.05
Total		80	1450	1530	20.02	967	5146	6113	79.98	1047	6596	7643	100

Table 6
Comparison of the Index Numbers of Outmigrant Juvenile Chinook Salmon Migrating Out of the Upper Nechako River With Numbers of the Parent Generation

Year	Total number of spawners	Number of spawners upstream of Diamond Island	Index number of outmigrating 0+ chinook the following year	Sampling period	Total index number of outmigrating 0+ chinook the following year	Total sampling period
1990	2642	1686	104182	Apr. 5 - July 31	105702	Apr. 5 - Nov. 15
1991	2360	1306	116538	Mar. 14 - July 17	119860	Mar. 14 - Nov. 17
1992	2498	1074	143000	Apr. 2 - July 19	146170	Apr. 2 - Nov. 16
1993	664	347	47589	Apr. 2 - July 17	47589	Apr. 2 - July 17
1994	1144	659	45025	Apr. - July 13	45025	Apr. 13 - July 11
1995	1689	1143	-	-	-	-

NOTE: the number of outmigrants estimated in 1991 (brood year 1990) is not comparable to the numbers of outmigrants estimated in subsequent years because one of the RSTs in 1991 had a wooden wing attached to one side that funneled additinal fry into the RST, and which, therefore, required the assumption of greater flow into the trap.

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APPENDIX 1

Mean Size and Condition of Fish Captured by Electrofishing in the Nechako River, 1995

Appendix 1
Mean Size and Condition of Fish Captured by Electrofishing in the Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
Chinook salmon 0+ (day)										
14-Apr	104	37	2	40	0.41	0.08	40	0.79	0.13	40
15-Apr	105	37	2	10	0.40	0.10	10	0.79	0.09	10
16-Apr	106	38	2	85	0.43	0.09	84	0.78	0.11	84
17-Apr	107	38	2	77	0.42	0.07	77	0.75	0.08	77
18-Apr	108	37	2	23	0.39	0.05	23	0.78	0.10	23
09-May	129	39	2	20	0.51	0.13	20	0.87	0.12	20
10-May	130	38	3	32	0.46	0.18	32	0.79	0.13	32
11-May	131	40	2	89	0.53	0.14	89	0.82	0.10	89
12-May	132	39	2	76	0.49	0.15	76	0.81	0.14	76
13-May	133	40	3	25	0.57	0.20	25	0.84	0.14	25
14-May	134	39	3	89	0.46	0.19	89	0.77	0.12	89
07-Jun	158	60	3	20	2.43	0.39	20	1.14	0.07	20
08-Jun	159	49	4	48	1.23	0.44	48	0.99	0.23	48
09-Jun	160	48	3	8	1.12	0.33	7	1.03	0.11	7
10-Jun	161	50	2	3	1.46	0.19	3	1.19	0.06	3
11-Jun	162	50	5	7	1.44	0.46	7	1.12	0.07	7
12-Jun	163	59	6	3	2.67	0.95	3	1.27	0.09	3
13-Jun	164	56	-	1	2.37	-	1	1.35	-	1
03-Nov	307	95	6	20	9.33	2.02	20	1.09	0.11	20
04-Nov	308	94	5	15	9.38	1.81	15	1.12	0.15	15
05-Nov	309	94	1	2	7.94	0.13	2	0.97	0.04	2
06-Nov	310	94	7	23	9.83	2.01	23	1.16	0.16	23
07-Nov	311	98	9	7	9.63	2.29	7	1.02	0.05	7
Chinook salmon 0+ (night)										
14-Apr	104	38	2	27	0.43	0.06	27	0.77	0.07	27
15-Apr	105	38	2	5	0.40	0.04	5	0.75	0.07	5
16-Apr	106	38	2	28	0.44	0.07	28	0.79	0.08	28
17-Apr	107	39	1	144	0.45	0.08	144	0.77	0.10	144
18-Apr	108	39	2	50	0.42	0.09	50	0.74	0.10	50
19-Apr	109	38	2	5	0.45	0.19	5	0.80	0.24	5
10-May	130	39	2	57	0.49	0.11	57	0.85	0.12	57
11-May	131	40	3	165	0.56	0.16	165	0.87	0.13	165
12-May	132	40	3	228	0.59	0.17	228	0.88	0.10	228
13-May	133	40	3	147	0.57	0.18	147	0.89	0.15	147
14-May	134	40	3	144	0.61	0.22	135	0.88	0.13	135
15-May	135	40	3	191	0.55	0.20	191	0.84	0.11	191
08-Jun	159	59	3	20	2.12	0.33	20	1.02	0.08	20
09-Jun	160	52	5	62	1.57	0.53	62	1.09	0.13	62
10-Jun	161	52	5	211	1.72	0.57	211	1.17	0.16	211
11-Jun	162	55	6	279	2.22	0.83	279	1.25	0.16	279
12-Jun	163	56	6	101	2.17	0.76	101	1.20	0.10	101
13-Jun	164	57	6	78	2.35	0.84	78	1.23	0.09	78
14-Jun	165	58	7	141	2.54	0.97	141	1.24	0.14	141
18-Jun	169	51	5	10	1.65	0.77	10	1.15	0.29	10

Appendix 1 (continued)
Mean Size and Condition of Fish Captured by Electrofishing in the Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
03-Nov	307	94	8	53	9.19	2.37	53	1.10	0.13	53
04-Nov	308	93	7	14	8.84	1.84	14	1.10	0.10	14
05-Nov	309	91	4	4	8.10	2.29	4	1.05	0.15	4
06-Nov	310	93	8	33	8.44	2.10	33	1.05	0.14	33
07-Nov	311	98	5	11	11.89	2.92	11	1.24	0.16	11
Chinook salmon 1+ (day)										
14-Apr	104	96	3	3	11.23	2.21	3	1.26	0.14	3
16-Apr	106	100	14	14	13.86	6.08	14	1.31	0.17	14
17-Apr	107	100	5	2	9.45	1.36	2	0.96	0.00	2
Chinook salmon 1+ (night)										
14-Apr	104	98	4	2	11.21	0.33	2	1.20	0.19	2
15-Apr	105	98	12	4	11.88	3.02	4	1.26	0.22	4
16-Apr	106	101	10	3	12.22	3.45	3	1.15	0.06	3
17-Apr	107	98	7	18	12.12	1.75	18	1.30	0.16	18
18-Apr	108	92	3	3	11.96	1.98	3	1.54	0.32	3
10-May	130	103	-	1	16.03	-	1	1.47	-	1
11-May	131	99	11	3	14.63	5.06	3	1.47	0.13	3
12-May	132	106	9	8	13.78	2.47	8	1.15	0.13	8
13-May	133	103	-	1	11.61	-	1	1.06	-	1
15-May	135	106	-	1	16.14	-	1	1.36	-	1
Burbot, adult (day)										
14-Apr	104	131	-	1	21.93	-	1	0.98	-	1
16-Apr	106	180	-	1	48.09	-	1	0.82	-	1
Burbot, adult (night)										
11-May	131	227	-	1	-	-	-	-	-	-
12-Jun	163	198	-	1	22.77	-	1	0.29	-	1
Burbot, juveniles (day)										
14-Apr	104	102	-	1	7.45	-	1	0.70	-	1
15-Apr	105	261	-	1	-	-	-	-	-	-
17-Apr	107	170	-	1	-	-	-	-	-	-
15-May	135	129	-	1	16.08	-	1.00	0.75	-	1
10-Jun	161	215	-	1	-	-	-	-	-	-
14-Jun	165	120	-	1	12.70	-	-	0.73	-	1
Rainbow trout, adult (day)										
14-Apr	104	250	-	1	-	-	0	-	-	0
18-Apr	108	167	29	3	-	-	0	-	-	0
04-Nov	308	219	-	1	-	-	0	-	-	0

Appendix 1 (continued)
Mean Size and Condition of Fish Captured by Electrofishing in the Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
Rainbow trout, adult (night)										
15-Apr	105	295	-	1	-	-	0	-	-	0
18-Apr	108	240	-	1	-	-	0	-	-	0
14-May	134	300	-	1	-	-	0	-	-	0
14-Jun	165	250	-	1						
Rainbow trout, juvenile (day)										
15-Apr	105	86	5	15	8.50	1.70	15	1.34	0.18	15
16-Apr	106	96	8	4	9.63	3.13	4	1.07	0.21	4
17-Apr	107	98	1	2	12.22	1.57	2	1.32	0.14	2
18-Apr	108	225	35	2	27.50	3.54	2	0.25	0.09	2
09-May	129	116	30	6	21.33	20.63	6	1.14	0.07	6
10-May	130	89	-	1	7.92	-	1	1.12	-	1
12-May	132	99	-	1	11.60	-	1	1.20	-	1
07-Jun	158	117	13	6	18.53	5.58	6	1.12	0.04	6
03-Nov	307	134	42	7	33.52	31.40	7	1.08	0.11	7
05-Nov	309	145	-	1	32.68	-	1	1.07	-	1
06-Nov	310	77	8	2	4.58	1.10	2	1.02	0.06	2
07-Nov	311	111	28	12	15.87	14.13	12	1.00	0.16	12
Rainbow trout, juvenile (night)										
15-Apr	105	95	8	11	9.93	2.62	11	1.13	0.09	11
16-Apr	106	84	9	6	7.69	3.21	6	1.26	0.18	6
17-Apr	107	88	9	12	8.66	2.26	12	1.26	0.17	12
18-Apr	108	82	-	1	5.66	-	1	1.03	-	1
09-May	129	109	9	5	13.43	2.64	5	1.03	0.12	5
10-May	130	87	33	11	10.28	12.10	11	1.10	0.16	11
11-May	131	91	7	10	9.67	1.79	10	1.31	0.24	10
12-May	132	98	8	5	11.24	2.79	5	1.18	0.11	5
14-May	134	96	-	1	9.73	-	1	1.10	-	1
08-Jun	159	127	11	12	22.09	6.19	12	1.06	0.13	12
09-Jun	160	99	-	1	10.50	-	1	1.08	-	1
10-Jun	161	115	7	8	16.68	3.75	8	1.09	0.11	8
11-Jun	162	119	18	10	21.98	11.08	10	1.22	0.08	10
13-Jun	164	127	-	1	21.93	-	1	1.07	-	1
14-Jun	165	125	-	1	23.19	-	1	1.19	-	1
03-Nov	307	139	39	9	31.66	21.39	9	1.03	0.14	9
04-Nov	308	170	32	2	50.90	29.19	2	0.98	0.04	2
06-Nov	310	99	31	2	11.24	8.47	2	1.06	0.13	2
07-Nov	311	101	16	16	12.08	6.92	16	1.10	0.19	16
Sockeye salmon, juvenile (day)										
14-May	134	28	-	1	0.15	-	1	0.68	-	1

APPENDIX 2

Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

Appendix 2

Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
Chinook Salmon 0+ (day)										
14-Apr	104	38.0	1.0	3	0.40	0.06	3	0.73	0.05	3
15-Apr	105	37.7	0.6	3	0.34	0.02	3	0.64	0.04	3
16-Apr	106	38.0	-	1	0.36	-	1	0.66	-	1
17-Apr	107	38.0	-	1	0.39	-	1	0.71	-	1
20-Apr	110	37.7	1.2	3	0.37	0.02	3	0.69	0.07	3
21-Apr	111	38.7	2.1	3	0.39	0.09	3	0.67	0.05	3
22-Apr	112	38.3	0.6	3	0.37	0.03	3	0.66	0.05	3
23-Apr	113	38.4	1.1	25	0.40	0.04	25	0.70	0.06	25
24-Apr	114	38.0	-	1	0.40	-	1	0.73	-	1
25-Apr	115	37.0	1.4	2	0.37	0.01	2	0.73	0.06	2
26-Apr	116	36.4	1.1	5	0.37	0.05	5	0.77	0.06	5
27-Apr	117	37.2	1.6	5	0.35	0.04	5	0.67	0.04	5
28-Apr	118	37.8	1.6	8	0.40	0.04	8	0.74	0.09	8
29-Apr	119	39.4	2.6	14	0.42	0.03	14	0.69	0.10	14
30-Apr	120	37.9	1.4	8	0.41	0.08	8	0.75	0.08	8
01-May	121	37.2	1.1	10	0.36	0.06	10	0.70	0.10	10
02-May	122	37.2	1.6	15	0.41	0.05	15	0.80	0.13	15
03-May	123	37.0	1.9	20	0.38	0.09	20	0.74	0.07	20
04-May	124	37.8	2.1	15	0.41	0.07	15	0.75	0.05	15
05-May	125	37.8	1.0	13	0.42	0.05	13	0.77	0.05	13
06-May	126	37.4	2.4	11	0.40	0.12	11	0.75	0.07	11
07-May	127	36.4	1.3	5	0.36	0.04	5	0.74	0.05	5
08-May	128	38.4	2.6	15	0.47	0.13	15	0.80	0.09	15
09-May	129	37.9	1.8	27	0.42	0.07	27	0.76	0.04	27
10-May	130	38.3	2.1	30	0.46	0.09	30	0.81	0.08	30
11-May	131	37.9	2.3	23	0.44	0.12	23	0.79	0.08	23
12-May	132	38.9	2.5	21	0.48	0.13	21	0.79	0.08	21
13-May	133	38.0	1.9	28	0.43	0.06	28	0.78	0.06	28
14-May	134	39.5	4.3	16	0.52	0.17	16	0.84	0.13	16
15-May	135	38.6	4.3	12	0.49	0.27	12	0.80	0.11	12
16-May	136	37.7	2.7	20	0.43	0.16	20	0.77	0.11	20
17-May	137	39.5	2.3	18	0.54	0.13	18	0.87	0.08	18
18-May	138	41.8	4.1	12	0.73	0.32	12	0.95	0.10	12
19-May	139	44.1	5.3	13	0.87	0.37	13	0.96	0.12	13
20-May	140	43.3	4.4	16	0.82	0.29	16	0.98	0.08	16
21-May	141	41.0	1.4	5	0.57	0.10	5	0.83	0.07	5
22-May	142	44.8	5.1	10	0.92	0.33	10	0.97	0.11	10
23-May	143	43.1	3.5	10	0.83	0.23	10	1.01	0.10	10
24-May	144	46.4	4.5	10	1.06	0.39	10	1.02	0.13	10
25-May	145	44.8	2.6	13	0.95	0.15	13	1.05	0.06	13
26-May	146	46.3	4.1	9	1.02	0.34	9	1.00	0.05	9
27-May	147	46.9	3.6	16	1.05	0.29	16	0.99	0.07	16
28-May	148	47.3	4.0	12	1.05	0.28	12	0.97	0.06	12

Appendix 2 (continued)
Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
29-May	149	48.1	5.3	15	1.14	0.41	15	0.98	0.09	15
30-May	150	52.6	7.5	13	1.69	0.82	13	1.09	0.06	13
31-May	151	53.1	5.7	16	1.64	0.52	16	1.05	0.08	16
01-Jun	152	52.2	2.9	12	1.52	0.26	12	1.07	0.10	12
02-Jun	153	52.5	5.6	10	1.60	0.63	10	1.07	0.22	10
03-Jun	154	51.9	5.7	7	1.54	0.52	7	1.07	0.04	7
04-Jun	155	50.6	7.2	8	1.57	0.84	8	1.11	0.18	8
05-Jun	156	54.5	4.1	10	1.74	0.41	10	1.06	0.05	10
06-Jun	157	53.7	3.6	15	1.67	0.39	15	1.06	0.10	15
07-Jun	158	57.2	4.5	6	2.12	0.69	6	1.10	0.10	6
08-Jun	159	52.7	8.6	7	1.69	0.72	7	1.11	0.14	7
09-Jun	160	57.0	7.0	7	2.21	0.68	7	1.20	0.26	7
10-Jun	161	49.0	-	1	1.92	-	1	1.63	-	1
11-Jun	162	56.2	7.6	5	2.43	0.95	5	1.31	0.09	5
12-Jun	163	57.0	0.0	2	1.98	0.01	2	1.06	0.01	2
16-Jun	167	60.0	-	1	2.24	-	1	1.04	-	1
17-Jun	168	61.0	3.5	3	2.33	0.36	3	1.02	0.03	3
18-Jun	169	59.3	5.7	3	2.33	0.69	3	1.09	0.03	3
19-Jun	170	61.0	-	1	2.24	-	1	0.99	-	1
21-Jun	172	56.0	9.5	3	1.96	1.27	3	1.02	0.11	3
22-Jun	173	59.5	0.7	2	2.28	0.15	2	1.08	0.03	2
25-Jun	176	72.0		1	3.99	-	1	1.07	-	1
27-Jun	178	60.5	0.7	2	2.50	0.01	2	1.13	0.03	2
28-Jun	179	58.0	-	1	2.04	-	1	1.05	-	1
29-Jun	180	59.7	0.6	3	2.15	0.17	3	1.01	0.05	3
Chinook Salmon 0+ (night)										
15-Apr	105	38.7	1.5	3	0.43	0.03	3	0.74	0.09	3
16-Apr	106	37.8	1.6	5	0.34	0.06	5	0.63	0.04	5
17-Apr	107	37.8	1.2	8	0.36	0.05	8	0.66	0.05	8
18-Apr	108	37.6	1.0	7	0.36	0.02	7	0.67	0.04	7
19-Apr	109	37.7	0.9	10	0.36	0.06	10	0.66	0.10	10
20-Apr	110	38.0	1.0	17	0.39	0.06	17	0.70	0.09	17
21-Apr	111	37.9	1.1	17	0.38	0.05	17	0.69	0.07	17
22-Apr	112	37.6	1.4	34	0.37	0.05	34	0.69	0.06	34
23-Apr	113	38.7	1.3	13	0.46	0.07	13	0.79	0.09	13
24-Apr	114	37.5	1.1	28	0.42	0.06	28	0.79	0.11	28
25-Apr	115	36.7	1.7	33	0.38	0.06	33	0.77	0.07	33
26-Apr	116	37.3	1.5	44	0.38	0.04	44	0.73	0.04	44
27-Apr	117	37.6	1.6	41	0.39	0.06	41	0.73	0.09	41
28-Apr	118	37.9	2.2	49	0.38	0.06	49	0.70	0.08	49
29-Apr	119	38.3	1.3	42	0.41	0.06	42	0.73	0.07	42
30-Apr	120	38.0	1.7	53	0.40	0.06	53	0.72	0.06	53

Appendix 2 (continued)
Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
01-May	121	38.0	1.6	35	0.40	0.06	35	0.72	0.07	35
02-May	122	37.3	1.3	42	0.40	0.05	42	0.77	0.08	42
03-May	123	37.5	1.4	45	0.42	0.06	45	0.79	0.10	45
04-May	124	37.6	1.8	54	0.39	0.06	54	0.73	0.05	54
05-May	125	37.4	1.7	58	0.38	0.06	58	0.73	0.04	58
06-May	126	37.0	1.7	56	0.37	0.06	56	0.72	0.05	56
07-May	127	37.2	1.9	51	0.37	0.06	51	0.72	0.05	51
08-May	128	37.6	1.9	50	0.39	0.08	50	0.73	0.06	50
09-May	129	37.6	1.9	57	0.41	0.07	57	0.76	0.06	57
10-May	130	37.5	2.1	64	0.41	0.09	64	0.76	0.06	64
11-May	131	37.1	2.1	61	0.38	0.09	61	0.74	0.06	61
12-May	132	37.6	2.0	64	0.40	0.06	64	0.75	0.13	64
13-May	133	38.2	2.0	54	0.40	0.07	54	0.72	0.06	54
14-May	134	37.7	2.0	34	0.41	0.10	34	0.75	0.10	34
15-May	135	38.9	2.4	48	0.44	0.15	48	0.73	0.09	48
16-May	136	37.2	3.0	47	0.39	0.16	47	0.73	0.08	47
17-May	137	38.0	3.6	50	0.44	0.21	50	0.76	0.10	50
18-May	138	38.2	3.5	34	0.46	0.22	34	0.78	0.09	34
19-May	139	40.5	4.7	32	0.59	0.36	32	0.82	0.12	32
20-May	140	40.8	4.5	40	0.62	0.29	40	0.85	0.12	40
21-May	141	40.4	3.9	51	0.59	0.25	51	0.85	0.12	51
22-May	142	41.5	4.3	30	0.68	0.28	30	0.90	0.09	30
23-May	143	44.6	6.7	30	0.88	0.49	30	0.89	0.13	30
24-May	144	42.8	7.6	19	0.83	0.50	19	0.90	0.15	19
25-May	145	48.0	4.0	13	1.21	0.36	13	1.06	0.11	13
26-May	146	50.3	5.8	16	1.26	0.42	16	0.96	0.16	16
27-May	147	48.6	5.8	15	1.22	0.53	15	0.99	0.10	15
28-May	148	50.9	8.0	28	1.31	0.48	28	0.98	0.17	28
29-May	149	51.3	5.2	23	1.39	0.50	23	0.99	0.09	23
30-May	150	52.7	5.1	20	1.57	0.50	20	1.05	0.18	20
31-May	151	52.4	6.0	30	1.50	0.61	30	1.00	0.06	30
01-Jun	152	55.7	5.8	33	1.77	0.37	33	1.05	0.19	33
02-Jun	153	54.0	4.2	26	1.69	0.46	26	1.04	0.08	26
03-Jun	154	53.5	5.3	22	1.69	0.56	22	1.06	0.10	22
04-Jun	155	55.1	5.8	27	1.87	0.67	27	1.07	0.09	27
05-Jun	156	54.8	5.9	24	1.85	0.72	24	1.08	0.10	24
06-Jun	157	54.6	3.6	25	1.77	0.39	25	1.07	0.07	25
07-Jun	158	57.6	5.2	27	2.29	0.72	27	1.18	0.20	27
08-Jun	159	57.7	6.1	22	2.18	0.78	22	1.11	0.22	22
09-Jun	160	58.8	8.4	23	2.51	1.05	23	1.17	0.12	23
10-Jun	161	57.1	5.8	17	2.20	0.54	17	1.17	0.11	17
11-Jun	162	55.6	4.4	18	2.11	0.51	18	1.22	0.13	18
12-Jun	163	56.9	6.6	12	2.76	1.00	12	1.45	0.23	12
13-Jun	164	57.5	8.4	6	2.37	0.84	6	1.23	0.27	6
14-Jun	165	59.6	2.9	15	2.36	0.35	15	1.11	0.05	15

Appendix 2 (continued)
Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

Date	DOY	Length (mm)			Weight (g)			Condition (g/mm^3)		
		Mean	SD	n	Mean	SD	n	Mean	SD	n
15-Jun	166	61.2	4.7	14	2.62	0.62	14	1.13	0.08	14
16-Jun	167	58.2	10.1	12	2.26	1.22	12	1.02	0.14	12
17-Jun	168	62.1	6.9	11	2.70	0.98	11	1.08	0.08	11
18-Jun	169	61.1	7.9	14	2.68	1.29	14	1.11	0.08	14
19-Jun	170	64.8	6.1	12	3.09	0.98	12	1.10	0.07	12
20-Jun	171	61.9	6.0	16	2.66	0.79	16	1.09	0.05	16
21-Jun	172	64.6	9.5	18	2.96	1.10	18	1.06	0.13	18
22-Jun	173	62.2	4.9	14	2.69	0.68	14	1.09	0.05	14
23-Jun	174	66.6	8.5	7	3.42	1.34	7	1.10	0.05	7
24-Jun	175	69.5	7.8	2	3.71	1.07	2	1.09	0.05	2
25-Jun	176	62.7	5.5	7	2.54	0.64	7	1.02	0.14	7
26-Jun	177	75.0		1	4.91	-	1	1.16	-	1
27-Jun	178	68.8	8.0	4	3.73	1.31	4	1.11	0.01	4
28-Jun	179	72.0	3.7	5	4.13	0.65	5	1.10	0.03	5
29-Jun	180	66.0	8.8	7	3.42	1.54	7	1.13	0.04	7
30-Jun	181	66.5	6.0	12	3.37	1.03	12	1.11	0.07	12
01-Jul	182	67.4	6.6	5	3.67	1.12	5	1.17	0.08	5
02-Jul	183	66.1	6.4	7	3.41	1.38	7	1.13	0.11	7
03-Jul	184	64.5	4.9	2	2.69	0.76	2	0.99	0.06	2
04-Jul	185	61.0	-	1	2.54	-	1	1.12	-	1
05-Jul	186	67.0	-	1	2.96	-	1	0.98	-	1
06-Jul	187	68.3	7.3	4	3.53	1.31	4	1.08	0.06	4
Chinook Salmon 1+ (day)										
30-Apr	120	101.0	-	1	10.71	-	1	1.04	-	1
12-May	132	109.0	-	1	14.21	-	1	1.10	-	1
19-May	139	117.0	-	1	15.07	-	1	0.94	-	1
22-May	142	108.0	-	1	13.04	-	1	1.04	-	1
Chinook Salmon 1+ (night)										
13-Apr	103	98.0	-	1	10.28	-	1	1.09	-	1
14-Apr	104	101.5	7.8	2	11.71	3.05	2	1.11	0.04	2
15-Apr	105	97.5	7.8	2	9.99	3.39	2	1.05	0.11	2
16-Apr	106	110.0	-	1	12.56	-	1	0.94	-	1
19-Apr	109	101.7	5.5	3	9.88	2.07	3	0.93	0.05	3
20-Apr	110	103.0	-	1	11.07	-	1	1.01	-	1
21-Apr	111	135.0	-	1	25.09	-	1	1.02	-	1
22-Apr	112	103.3	2.5	3	10.45	1.20	3	0.94	0.06	3
24-Apr	114	103.0	-	1	16.03	-	1	1.47	-	1
26-Apr	116	118.5	13.4	2	16.74	7.75	2	0.96	0.13	2
27-Apr	117	108.5	6.4	2	13.36	1.94	2	1.04	0.03	2
28-Apr	118	110.0	8.5	2	14.22	3.22	2	1.06	0.00	2
29-Apr	119	104.0	-	1	11.60	-	1	1.03	-	1
30-Apr	120	118.0	-	1	14.32	-	1	0.87	-	1

Appendix 2 (continued)
Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

Date	DOY	Length (mm)			Weight (g)			Condition (g/mm³)		
		Mean	SD	n	Mean	SD	n	Mean	SD	n
01-May	121	106.0	-	1	13.78	-	1	1.16	-	1
02-May	122	93.0	-	1	10.70	-	1	1.33	-	1
04-May	124	97.0	-	1	8.05	-	1	0.88	-	1
05-May	125	104.5	14.8	2	11.44	4.00	2	0.99	0.07	2
06-May	126	92.5	3.5	2	8.55	1.95	2	1.07	0.12	2
08-May	128	120.0	-	1	19.03	-	1	1.10	-	1
10-May	130	107.0	5.7	2	13.87	2.99	2	1.12	0.07	2
13-May	133	111.0	-	1	15.32	-	1	1.12	-	1
14-May	134	94.0	-	1	7.38	-	1	0.89	-	1
15-May	135	113.7	2.5	3	17.42	0.67	3	1.19	0.04	3
16-May	136	106.5	0.7	2	13.54	1.09	2	1.12	0.07	2
17-May	137	110.8	12.5	5	16.18	5.31	5	1.15	0.17	5
18-May	138	116.0	12.3	12	18.11	6.13	12	1.12	0.07	12
19-May	139	100.7	10.1	10	14.97	4.23	10	1.44	0.19	10
20-May	140	105.0	7.1	2	13.30	3.25	2	1.14	0.05	2
21-May	141	110.3	1.7	4	16.02	2.00	4	1.19	0.12	4
22-May	142	104.0	4.2	2	13.27	2.21	2	1.17	0.05	2
24-May	144	96.5	6.4	2	12.53	2.38	2	1.39	0.01	2
25-May	145	110.7	2.5	3	13.88	2.30	3	1.03	0.19	3
26-May	146	99.0	7.1	2	9.99	2.26	2	1.02	0.01	2
27-May	147	101.0	2.8	2	11.76	1.30	2	1.14	0.03	2
29-May	149	102.0	-	1	11.84	-	1	1.12	-	1
30-May	150	102.0	-	1	11.76	-	1	1.11	-	1
31-May	151	116.0	-	1	16.46	-	1	1.05	-	1
02-Jun	153	121.0	-	1	19.21	-	1	1.08	-	1
03-Jun	154	103.0	-	1	12.07	-	1	1.10	-	1
Rainbow Trout Adults (day)										
03-Jul	184	163.0	-	1	56.49	-	1	1.30	-	1
Rainbow Trout Adults (night)										
19-Apr	109	200.0	-	1	30.00	-	1	0.38	-	1
02-May	122	148.0	-	1	46.13	-	1	1.42	-	1
11-May	131	189.0	86.3	2	30.59	13.31	2	0.63	0.53	2
18-Jun	169	260.0	-	1	-	-	1	-	-	1
24-Jun	175	120.0	-	1	-	-	1	-	-	0
Rainbow Trout Juveniles (night)										
16-Apr	106	95.3	1.5	3	-	-	3	-	-	3
03-May	123	72.0	-	1	4.15	-	1	1.11	-	1
20-May	140	105.0	-	1	18.25	-	1	1.58	-	1
21-May	141	80.0	-	1	4.92	-	1	0.96	-	1
22-May	142	159.0	-	1	39.97	-	1	0.99	-	1
23-May	143	83.0	-	1	6.23	-	1	1.09	-	1

Appendix 2 (continued)
Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
Burbot Juvenile (night)										
22-Apr	112	255.0	-	1	-	-	1	-	-	1
26-Apr	116	230.0	-	1	-	-	1	-	-	1
Sockeye Salmon 0+ (day)										
14-May	134	31.0	-	1	0.27	-	1	0.91	-	1
20-May	140	34.0	-	1	0.27	-	1	0.69	-	1
29-May	149	27.0	-	1	0.21	-	1	1.07	-	1
30-May	150	27.0	-	1	0.12	-	1	0.61	-	1
07-Jun	158	33.0	-	1	0.26	-	1	0.72	-	1
08-Jun	159	32.0	-	1	0.42	-	1	1.28	-	1
09-Jun	160	31.5	0.7	2	0.38	0.20	2	1.24	0.72	2
11-Jun	162	27.0	-	1	0.38	-	1	1.93	-	1
13-Jun	164	36.0	-	1	0.34	-	1	0.73	-	1
16-Jun	167	35.0	-	1	0.32	-	1	0.75	-	1
18-Jun	169	36.1	2.6	7	0.34	0.07	7	0.70	0.03	7
19-Jun	170	36.5	1.7	4	0.37	0.06	4	0.76	0.04	4
20-Jun	171	32.0	-	1	0.22	-	1	0.67	-	1
21-Jun	172	35.7	3.1	7	0.34	0.07	7	0.74	0.09	7
22-Jun	173	34.5	1.7	4	0.33	0.05	4	0.79	0.04	4
24-Jun	175	36.0	-	1	0.44	-	1	0.94	-	1
27-Jun	178	45.0	-	1	0.76	-	1	0.83	-	1
29-Jun	180	37.2	3.9	5	0.43	0.15	5	0.81	0.06	5
06-Jul	187	42.0	-	1	0.59	-	1	0.80	-	1
Sockeye Salmon 0+ (night)										
21-Apr	111	37.8	1.0	4	0.38	0.03	4	0.70	0.03	4
02-May	122	26.0	-	1	0.28	-	1	1.59	-	1
04-May	124	30.0	0.8	4	0.17	0.03	4	0.64	0.05	4
06-May	126	30.7	3.5	3	0.18	0.08	3	0.61	0.09	3
08-May	128	28.0	-	1	0.11	-	1	0.50	-	1
09-May	129	28.0	-	1	0.12	-	1	0.55	-	1
10-May	130	28.3	1.4	7	0.13	0.04	7	0.57	0.10	7
11-May	131	27.7	1.5	10	0.12	0.02	10	0.55	0.08	10
12-May	132	28.5	1.6	15	0.13	0.03	15	0.56	0.06	15
13-May	133	27.7	1.5	3	0.12	0.02	3	0.56	0.03	3
14-May	134	29.5	0.7	2	0.15	0.02	2	0.56	0.04	2
16-May	136	24.0	-	1	0.07	-	1	0.51	-	1
17-May	137	29.0	1.4	2	0.15	0.02	2	0.59	0.00	2
18-May	138	28.0	-	1	0.13	-	1	0.59	-	1
20-May	140	30.0	2.8	2	0.18	0.08	2	0.62	0.11	2
21-May	141	31.0	-	1	0.19	-	1	0.64	-	1

Appendix 2 (continued)

Mean Size and Condition of Fish Captured by Traps at Diamond Island, Nechako River, 1995

		Length (mm)			Weight (g)			Condition (g/mm^3)		
Date	DOY	Mean	SD	n	Mean	SD	n	Mean	SD	n
23-May	143	30.0	2.8	2	0.18	0.06	2	0.63	0.06	2
24-May	144	29.0	-	1	0.18	-	1	0.74	-	1
25-May	145	32.0	-	1	0.24	-	1	0.73	-	1
27-May	147	32.0	-	1	0.23	-	1	0.70	-	1
28-May	148	33.0	1.4	2	0.28	0.04	2	0.78	0.02	2
29-May	149	33.0	-	1	0.28	-	1	0.78	-	1
30-May	150	32.0	-	1	0.25	-	1	0.76	-	1
31-May	151	31.0	-	1	0.18	-	1	0.60	-	1
04-Jun	155	38.0	-	1	0.37	-	1	0.67	-	1
05-Jun	156	35.3	4.0	3	0.38	0.16	3	0.82	0.05	3
06-Jun	157	32.0	-	1	0.31	-	1	0.95	-	1
07-Jun	158	34.0	1.4	2	0.35	0.01	2	0.88	0.09	2
08-Jun	159	32.7	3.0	6	0.29	0.08	6	0.83	0.30	6
09-Jun	160	31.0	-	1	0.33	-	1	1.11	-	1
10-Jun	161	32.0	2.6	3	0.26	0.06	3	0.80	0.04	3
11-Jun	162	33.3	2.1	3	0.43	0.13	3	1.14	0.25	3
13-Jun	164	36.0	-	1	0.34	-	1	0.73	-	1
14-Jun	165	36.6	5.5	5	0.41	0.22	5	0.77	0.07	5
15-Jun	166	35.0	4.2	11	0.34	0.15	11	0.76	0.08	11
16-Jun	167	38.0	-	1	0.40	-	1	0.73	-	1
17-Jun	168	34.4	2.2	5	0.32	0.06	5	0.79	0.07	5
18-Jun	169	39.0	-	1	0.50	-	1	0.84	-	1
19-Jun	170	36.0	2.2	10	0.35	0.09	10	0.74	0.09	10
20-Jun	171	36.1	2.1	7	0.36	0.07	7	0.75	0.04	7
21-Jun	172	35.3	1.2	3	0.32	0.03	3	0.73	0.05	3
22-Jun	173	37.0	3.4	4	0.37	0.09	4	0.71	0.04	4
23-Jun	174	35.3	1.9	7	0.34	0.06	7	0.77	0.07	7
24-Jun	175	37.6	2.2	7	0.39	0.08	7	0.73	0.05	7
25-Jun	176	39.0	3.3	5	0.45	0.12	5	0.75	0.09	5
26-Jun	177	37.0	2.6	3	0.45	0.13	3	0.88	0.05	3
27-Jun	178	38.0	-	1	0.43	-	1	0.78	-	1
28-Jun	179	37.4	3.2	5	0.43	0.16	5	0.78	0.09	5
29-Jun	180	35.5	0.7	2	0.36	0.02	2	0.79	0.00	2
30-Jun	181	41.5	0.7	2	0.57	0.00	2	0.80	0.04	2
02-Jul	183	52.0	19.8	2	1.48	1.43	2	0.86	0.01	2
06-Jul	187	36.0	-	1	0.39	-	1	0.84	-	1
Sockeye Salmon 1+ (night)										
21-May	141	101.0	-	1	7.93	-	1	0.77	-	1
27-May	147	101.0	-	1	8.05	-	1	0.78	-	1

APPENDIX 3

Mean Monthly Electrofishing Catch-Per-Unit-Effort (CPUE) of Juvenile Chinook Salmon by 10 km Intervals of the Nechako River, 1995

Appendix 3

Mean Monthly Electrofishing Catch-Per-Unit-Effort (CPUE) of Juvenile Chinook Salmon by 10 km Intervals of the Nechako River, 1995

Date	Distance (km) from Kenney Dam	0+ $\log_e(CPUE+1)$ mean	0+ SD	0+ n	1+ $\log_e(CPUE+1)$ mean	1+ SD	1+ n
DAY							
April	0.0-9.9	0.0000	0.0000	4	0.0719	0.1438	4
	10.0-19.9	0.2898	0.4714	27	0.0224	0.1167	27
	20.0-29.9	1.0433	0.6757	38	0.1395	0.3961	38
	30.0-39.9	0.9430	0.6359	16	0.0276	0.1105	16
	50.0-59.9	0.5395	0.5670	19	0.0000	0.0000	19
	70.0-79.9	0.7653	0.7412	16	0.0000	0.0000	16
	80.0-89.9	0.1647	0.3166	17	0.0934	0.2717	17
May	0.0-9.9	0.0000	0.0000	4	0.0000	0.0000	4
	10.0-19.9	0.7289	1.0706	27	0.0000	0.0000	27
	20.0-29.9	1.0220	0.9044	38	0.0000	0.0000	38
	30.0-39.9	0.7054	1.0056	16	0.0000	0.0000	16
	50.0-59.9	0.4810	0.8452	19	0.0000	0.0000	19
	70.0-79.9	0.8958	0.7981	16	0.0000	0.0000	16
	80.0-89.9	0.9055	0.9093	17	0.0000	0.0000	17
June	0.0-9.9	1.2398	1.4437	4	0.0000	0.0000	4
	10.0-19.9	0.5276	0.8418	27	0.0000	0.0000	27
	20.0-29.9	0.1005	0.2774	38	0.0000	0.0000	38
	30.0-39.9	0.2625	0.3744	16	0.0000	0.0000	16
	50.0-59.9	0.1031	0.2462	19	0.0000	0.0000	19
	70.0-79.9	0.0379	0.1515	16	0.0000	0.0000	16
	80.0-89.9	0.0000	0.0000	17	0.0000	0.0000	17
November	0.0-9.9	0.3054	0.5290	3	0.0000	0.0000	3
	10.0-19.9	0.4754	0.6619	10	0.0000	0.0000	10
	20.0-29.9	0.2108	0.3846	38	0.0000	0.0000	38
	30.0-39.9	0.1784	0.4414	16	0.0000	0.0000	16
	50.0-59.9	0.0638	0.1911	19	0.0000	0.0000	19
	70.0-79.9	0.0783	0.3132	16	0.0000	0.0000	16
	80.0-89.9	0.4960	0.6106	17	0.0000	0.0000	17

Appendix 3 (continued)
Mean Monthly Electrofishing Catch-Per-Unit-Effort (CPUE) of Juvenile Chinook Salmon
by 10 km Intervals of the Nechako River, 1995

Date	Distance (km) from Kenney Dam	0+ $\log_e$(CPUE+1) mean	SD	n	1+ $\log_e$(CPUE+1) mean	SD	n
NIGHT							
April	0.0-9.9	0.0000	0.0000	4	0.0000	0.0000	4
	10.0-19.9	0.2089	0.4032	27	0.0224	0.1167	27
	20.0-29.9	1.3798	0.7596	38	0.2401	0.4487	38
	30.0-39.9	0.8135	0.6811	16	0.0613	0.2452	16
	50.0-59.9	0.2296	0.3659	19	0.0000	0.0000	19
	70.0-79.9	0.6196	0.7686	16	0.0758	0.2070	16
	80.0-89.9	0.0973	0.2192	17	0.1373	0.3130	17
May	0.0-9.9	0.0000	0.0000	4	0.0000	0.0000	4
	10.0-19.9	1.8769	1.0796	27	0.0673	0.1941	27
	20.0-29.9	2.1933	1.2004	38	0.1262	0.2877	38
	30.0-39.9	2.1551	1.0256	16	0.0379	0.1515	16
	50.0-59.9	1.5564	0.9308	19	0.0000	0.0000	19
	70.0-79.9	2.7489	0.9903	16	0.0000	0.0000	16
	80.0-89.9	2.7298	0.8114	17	0.0205	0.0845	17
June	0.0-9.9	2.5282	1.3634	4	0.0000	0.0000	4
	10.0-19.9	2.8607	1.0064	27	0.0000	0.0000	27
	20.0-29.9	2.3484	0.9295	38	0.0000	0.0000	38
	30.0-39.9	1.8460	1.0554	16	0.0000	0.0000	16
	50.0-59.9	1.1813	0.9221	19	0.0000	0.0000	19
	70.0-79.9	1.4633	0.7551	16	0.0000	0.0000	16
	80.0-89.9	1.8593	0.9592	17	0.0000	0.0000	17
November	0.0-9.9	0.7385	0.8749	3	0.0000	0.0000	3
	10.0-19.9	0.6580	0.8043	10	0.0000	0.0000	10
	20.0-29.9	0.4650	0.5889	38	0.0000	0.0000	38
	30.0-39.9	0.0758	0.2070	16	0.0000	0.0000	16
	50.0-59.9	0.1176	0.3439	17	0.0000	0.0000	17
	70.0-79.9	0.1225	0.2650	16	0.0000	0.0000	16
	80.0-89.9	0.5770	0.7974	16	0.0000	0.0000	16

APPENDIX 4

Catches of Juvenile Chinook Salmon by Rotary Screw Traps at Diamond Island, Nechako River, 1995

Appendix 4. Catches of juvenile chinook salmon by rotary screw traps at Diamond Island, Nechako River, 1995.

		RST No.1:						RST No.2:						RST No.3:						Total Catch:		Weighted Average	
	River flow	Trap flow	Percent flow	Catch:		Population estimate:		Trap flow	Percent flow	Catch:		Population estimate:		Trap flow	Percent flow	Catch:		Population estimate:					
Date	m³/s	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	1+	0+	1+	0+
Day																							
13-Apr	51.49	0.87	1.7	0	0	0	0	1.24	2.4	0	0	0	0	1.34	2.6	0	0	0	0	0	0	0	0
14-Apr	51.49	0.87	1.7	0	0	0	0	1.24	2.4	0	0	0	0	1.34	2.6	0	3	0	115	0	3	0	45
15-Apr	51.49	0.87	1.7	0	1	0	59	1.24	2.4	0	2	0	83	1.34	2.6	0	0	0	0	0	3	0	45
16-Apr	51.49	0.87	1.7	0	0	0	0	1.24	2.4	0	1	0	42	1.34	2.6	0	0	0	0	0	1	0	15
17-Apr	52.01	0.87	1.7	0	0	0	0	1.24	2.4	0	1	0	42	1.34	2.6	0	0	0	0	0	1	0	15
18-Apr	52.52	0.87	1.6	0	0	0	0	1.24	2.4	0	0	0	0	1.34	2.6	0	0	0	0	0	0	0	0
19-Apr	52.01	0.87	1.7	0	0	0	0	1.24	2.4	0	0	0	0	1.34	2.6	0	0	0	0	0	0	0	0
20-Apr	53.56	0.76	1.4	0	0	0	0	1.10	2.1	0	0	0	0	0.68	1.3	0	1	0	79	0	1	0	21
21-Apr	53.56	0.76	1.4	0	0	0	0	1.10	2.1	0	0	0	0	0.68	1.3	0	3	0	236	0	3	0	63
22-Apr	54.09	0.81	1.5	0	0	0	0	1.13	2.1	0	0	0	0	0.69	1.3	0	0	0	0	0	0	0	0
23-Apr	54.61	0.81	1.5	0	1	0	67	1.13	2.1	0	0	0	0	0.69	1.3	0	0	0	0	0	1	0	21
24-Apr	56.72	0.81	1.4	0	0	0	0	1.13	2.0	0	0	0	0	0.76	1.3	0	1	0	75	0	1	0	21
25-Apr	57.79	0.81	1.4	0	1	0	72	1.13	2.0	0	0	0	0	0.76	1.3	0	0	0	0	0	1	0	21
26-Apr	59.94	0.81	1.3	0	0	0	0	1.13	1.9	0	0	0	0	0.76	1.3	0	0	0	0	0	0	0	0
27-Apr	61.03	0.81	1.3	0	0	0	0	1.13	1.9	0	0	0	0	0.76	1.2	0	2	0	161	0	2	0	45
28-Apr	62.13	0.81	1.3	0	0	0	0	1.13	1.8	0	0	0	0	0.76	1.2	0	1	0	82	0	1	0	23
29-Apr	63.23	0.81	1.3	0	1	0	78	1.13	1.8	0	0	0	0	0.76	1.2	0	3	0	250	0	4	0	94
30-Apr	66.01	0.77	1.2	0	1	0	86	1.13	1.7	1	0	59	0	1.42	2.1	0	4	0	186	1	5	20	100
01-May	66.57	0.77	1.2	0	1	0	87	1.13	1.7	0	0	0	0	1.42	2.1	0	4	0	188	0	5	0	101
02-May	67.69	1.06	1.6	0	1	0	64	1.38	2.0	0	0	0	0	1.11	1.6	0	13	0	790	0	14	0	266
03-May	69.40	1.06	1.5	0	0	0	0	1.38	2.0	0	1	0	50	1.11	1.6	0	6	0	374	0	7	0	136
04-May	69.97	1.12	1.6	0	0	0	0	1.40	2.0	0	4	0	200	1.57	2.2	0	6	0	268	0	10	0	171
05-May	69.40	1.12	1.6	0	1	0	62	1.40	2.0	0	1	0	49	1.57	2.3	0	9	0	399	0	11	0	187
06-May	67.13	1.12	1.7	0	1	0	60	1.40	2.1	0	3	0	144	1.57	2.3	0	5	0	214	0	9	0	148
07-May	65.45	1.03	1.6	0	1	0	63	1.34	2.0	0	0	0	0	1.85	2.8	0	1	0	35	0	2	0	31
08-May	64.33	1.03	1.6	0	3	0	187	1.34	2.1	0	1	0	48	1.85	2.9	0	14	0	487	0	18	0	274
09-May	64.33	0.96	1.5	0	9	0	603	1.38	2.1	0	5	0	234	1.83	2.8	0	6	0	211	0	20	0	309
10-May	65.45	0.96	1.5	0	17	0	1159	1.38	2.1	0	5	0	238	1.83	2.8	0	16	0	572	0	38	0	597
11-May	66.57	0.99	1.5	0	3	0	202	1.29	1.9	0	3	0	155	1.54	2.3	0	11	0	477	0	17	0	297
12-May	68.26	0.99	1.4	0	5	0	346	1.29	1.9	1	5	53	265	1.54	2.3	0	9	0	400	1	19	18	340
13-May	68.26	0.99	1.4	0	7	0	484	1.29	1.9	0	6	0	317	1.54	2.3	0	9	0	400	0	22	0	394
14-May	68.26	0.99	1.4	0	3	0	208	1.29	1.9	0	0	0	0	1.54	2.3	0	12	0	533	0	15	0	269
15-May	67.69	0.98	1.4	0	4	0	276	1.37	2.0	0	3	0	148	1.38	2.0	0	2	0	98	0	9	0	164
16-May	67.13	0.98	1.5	0	3	0	205	1.37	2.0	0	2	0	98	1.38	2.0	0	11	0	537	0	16	0	288
17-May	66.57	1.04	1.6	0	1	0	64	1.41	2.1	0	1	0	47	1.53	2.3	0	12	0	521	0	14	0	234
18-May	65.45	1.04	1.6	0	1	0	63	1.41	2.2	0	0	0	0	1.53	2.3	0	10	0	427	0	11	0	181
19-May	64.33	1.04	1.6	0	1	0	62	1.41	2.2	1	0	46	0	1.53	2.4	0	22	0	923	1	23	16	372
20-May	63.78	1.04	1.6	0	1	0	61	1.41	2.2	0	1	0	45	1.53	2.4	0	12	0	499	0	14	0	224
21-May	62.68	0.93	1.5	0	0	0	0	1.19	1.9	0	0	0	0	1.76	2.8	0	3	0	107	0	3	0	48

Appendix 4. Catches of juvenile chinook salmon by rotary screw traps at Diamond Island, Nechako River, 1995.

		RST No.1:						RST No.2:						RST No.3:						Total Catch:		Weighted Average	
Date	River flow m^3/s	Trap flow m^3/s	Percent flow sampled	Catch: 1+	Catch: 0+	Population estimate: 1+	Population estimate: 0+	Trap flow m^3/s	Percent flow sampled	Catch: 1+	Catch: 0+	Population estimate: 1+	Population estimate: 0+	Trap flow m^3/s	Percent flow sampled	Catch: 1+	Catch: 0+	Population estimate: 1+	Population estimate: 0+	1+	0+	1+	0+
22-May	62.13	0.93	1.5	0	0	0	0	1.19	1.9	1	3	52	157	1.76	2.8	0	7	0	246	1	10	16	160
23-May	61.58	0.96	1.6	0	0	0	0	1.25	2.0	0	0	0	0	0.96	1.6	0	10	0	639	0	10	0	194
24-May	61.03	0.96	1.6	0	0	0	0	1.25	2.0	0	0	0	0	0.96	1.6	0	9	0	570	0	9	0	173
25-May	59.94	0.96	1.6	0	2	0	125	1.25	2.1	0	4	0	192	0.96	1.6	0	7	0	435	0	13	0	246
26-May	58.86	0.96	1.6	0	3	0	184	1.25	2.1	0	1	0	47	0.96	1.6	0	6	0	366	0	10	0	186
27-May	58.86	0.96	1.6	0	3	0	184	1.25	2.1	0	2	0	94	0.96	1.6	0	12	0	733	0	17	0	315
28-May	58.33	0.96	1.7	0	3	0	182	1.34	2.3	0	4	0	174	1.02	1.7	0	3	0	172	0	10	0	176
29-May	57.79	0.96	1.7	0	2	0	120	1.34	2.3	0	5	0	215	1.02	1.8	0	8	0	455	0	15	0	261
30-May	57.26	0.96	1.7	0	1	0	59	1.34	2.3	0	1	0	43	1.02	1.8	0	32	0	1802	0	34	0	586
31-May	56.72	0.86	1.5	0	3	0	198	1.25	2.2	0	3	0	136	1.02	1.8	0	10	0	558	0	16	0	290
01-Jun	56.19	0.86	1.5	0	1	0	65	1.25	2.2	0	1	0	45	1.02	1.8	0	22	0	1216	0	24	0	431
02-Jun	55.66	0.74	1.3	0	1	0	76	1.09	2.0	0	1	0	51	0.87	1.6	0	8	0	512	0	10	0	206
03-Jun	54.61	0.74	1.3	0	1	0	74	1.09	2.0	0	0	0	0	0.87	1.6	0	6	0	377	0	7	0	142
04-Jun	55.14	0.75	1.4	0	0	0	0	1.24	2.2	0	1	0	45	1.02	1.9	0	7	0	377	0	8	0	146
05-Jun	54.09	0.75	1.4	0	0	0	0	1.24	2.3	0	0	0	0	1.02	1.9	0	26	0	1372	0	26	0	467
06-Jun	54.09	0.78	1.4	0	0	0	0	1.10	2.0	0	5	0	247	1.10	2.0	0	10	0	494	0	15	0	273
07-Jun	53.56	0.78	1.5	0	0	0	0	1.10	2.0	0	4	0	196	1.10	2.0	0	2	0	98	0	6	0	108
08-Jun	53.04	0.82	1.6	0	3	0	193	1.20	2.3	0	1	0	44	0.99	1.9	0	3	0	161	0	7	0	123
09-Jun	52.01	0.82	1.6	0	2	0	127	1.18	2.3	0	4	0	176	0.93	1.8	0	1	0	56	0	7	0	124
10-Jun	51.49	0.82	1.6	0	1	0	63	1.17	2.3	0	0	0	0	0.87	1.7	0	0	0	0	0	1	0	18
11-Jun	52.01	0.82	1.6	0	0	0	0	1.17	2.2	0	1	0	44	0.87	1.7	0	4	0	239	0	5	0	91
12-Jun	53.04	0.82	1.5	0	1	0	65	1.17	2.2	0	0	0	0	0.87	1.6	0	1	0	61	0	2	0	37
13-Jun	52.52	0.82	1.6	0	0	0	0	1.17	2.2	0	0	0	0	0.87	1.7	0	0	0	0	0	0	0	0
14-Jun	52.01	0.82	1.6	0	0	0	0	1.17	2.2	0	0	0	0	0.87	1.7	0	0	0	0	0	0	0	0
15-Jun	51.49	0.77	1.5	0	0	0	0	1.14	2.2	0	0	0	0	1.18	2.3	0	0	0	0	0	0	0	0
16-Jun	51.49	0.77	1.5	0	0	0	0	1.14	2.2	0	1	0	45	1.18	2.3	0	0	0	0	0	1	0	17
17-Jun	50.98	0.50	1.0	0	1	0	101	1.15	2.3	0	2	0	89	1.47	2.9	0	0	0	0	0	3	0	49
18-Jun	51.49	0.50	1.0	0	1	0	102	1.15	2.2	0	1	0	45	1.47	2.8	0	1	0	35	0	3	0	50
19-Jun	52.52	0.83	1.6	0	0	0	0	1.20	2.3	0	0	0	0	1.24	2.4	0	1	0	42	0	1	0	16
20-Jun	52.52	0.83	1.6	0	0	0	0	1.20	2.3	0	0	0	0	1.24	2.4	0	0	0	0	0	0	0	0
21-Jun	52.01	0.83	1.6	0	2	0	126	1.20	2.3	0	1	0	43	1.24	2.4	0	0	0	0	0	3	0	48
22-Jun	51.49	0.79	1.5	0	2	0	130	1.18	2.3	0	0	0	0	1.29	2.5	0	0	0	0	0	2	0	32
23-Jun	50.98	0.79	1.5	0	0	0	0	1.18	2.3	0	0	0	0	1.29	2.5	0	0	0	0	0	0	0	0
24-Jun	51.49	0.79	1.5	0	0	0	0	1.21	2.4	0	0	0	0	1.19	2.3	0	0	0	0	0	0	0	0
25-Jun	50.98	0.79	1.5	0	0	0	0	1.21	2.4	0	1	0	42	1.19	2.3	0	0	0	0	0	1	0	16
26-Jun	50.47	0.80	1.6	0	0	0	0	1.15	2.3	0	0	0	0	0.82	1.6	0	0	0	0	0	0	0	0
27-Jun	63.78	0.80	1.3	0	1	0	79	1.15	1.8	0	0	0	0	0.82	1.3	0	1	0	78	0	2	0	46
28-Jun	49.96	0.80	1.6	0	0	0	0	1.15	2.3	0	0	0	0	0.82	1.6	0	1	0	61	0	1	0	18
29-Jun	49.96	0.72	1.4	0	1	0	70	1.10	2.2	0	0	0	0	1.29	2.6	0	2	0	77	0	3	0	48
30-Jun	49.96	0.72	1.4	0	0	0	0	1.10	2.2	0	0	0	0	1.29	2.6	0	0	0	0	0	0	0	0
01-Jul	50.47	0.72	1.4	0	0	0	0	1.10	2.2	0	0	0	0	1.29	2.6	0	0	0	0	0	0	0	0

Appendix 4. Catches of juvenile chinook salmon by rotary screw traps at Diamond Island, Nechako River, 1995.

		RST No.1:						RST No.2:						RST No.3:						Total Catch:		Weighted Average	
	River	Trap	Percent			Population		Trap	Percent			Population		Trap	Percent			Population					
	flow	flow	flow	Catch:		estimate:		flow	flow	Catch:		estimate:		flow	flow	Catch:		estimate:					
Date	m³/s	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	1+	0+	1+	0+
02-Jul	50.98	0.72	1.4	0	0	0	0	1.10	2.2	0	0	0	0	1.29	2.5	0	0	0	0	0	0	0	0
03-Jul	50.47	0.72	1.4	0	0	0	0	1.10	2.2	0	0	0	0	1.29	2.6	0	0	0	0	0	0	0	0
04-Jul	48.44	0.72	1.5	0	0	0	0	1.10	2.3	0	0	0	0	1.29	2.7	0	0	0	0	0	0	0	0
05-Jul	45.94	0.72	1.6	0	0	0	0	1.10	2.4	0	0	0	0	1.29	2.8	0	0	0	0	0	0	0	0
06-Jul	44.46	0.72	1.6	0	0	0	0	1.10	2.5	0	0	0	0	1.29	2.9	0	0	0	0	0	0	0	0
07-Jul	43.97	0.72	1.6	0	0	0	0	1.10	2.5	0	0	0	0	1.29	2.9	0	0	0	0	0	0	0	0
08-Jul	44.95	0.65	1.4	0	0	0	0	1.06	2.4	0	0	0	0	0.87	1.9	0	0	0	0	0	0	0	0
09-Jul	45.94	0.65	1.4	0	0	0	0	1.06	2.3	0	0	0	0	0.87	1.9	0	0	0	0	0	0	0	0
10-Jul	48.44	0.65	1.3	0	0	0	0	1.06	2.2	0	0	0	0	0.87	1.8	0	0	0	0	0	0	0	0
11-Jul	49.45	0.65	1.3	0	0	0	0	1.06	2.1	0	0	0	0	0.87	1.8	0	0	0	0	0	0	0	0
Total				0	103	0	6943			4	92	209	4374			0	411	0	20875	4	606	70	10653
Night																							
13-Apr	51.49	0.87	1.7	0	0	0	0	1.24	2.4	1	0	42	0	1.34	2.6	0	0	0	0	1	0	15	0
14-Apr	51.49	0.87	1.7	0	0	0	0	1.24	2.4	0	0	0	0	1.34	2.6	2	0	77	0	2	0	30	0
15-Apr	51.49	0.87	1.7	0	0	0	0	1.24	2.4	1	0	42	0	1.34	2.6	1	0	38	0	2	0	30	0
16-Apr	51.49	0.87	1.7	0	1	0	59	1.24	2.4	1	0	42	0	1.34	2.6	0	1	0	38	1	2	15	30
17-Apr	51.49	0.87	1.7	0	2	0	119	1.24	2.4	0	0	0	0	1.34	2.6	0	0	0	0	0	2	0	30
18-Apr	52.01	0.87	1.7	0	1	0	60	1.24	2.4	0	2	0	84	1.34	2.6	0	0	0	0	0	3	0	45
19-Apr	52.01	0.87	1.7	0	1	0	60	1.24	2.4	2	0	84	0	1.34	2.6	1	1	39	39	3	2	45	30
20-Apr	52.52	0.76	1.4	0	1	0	69	1.10	2.1	1	0	48	0	0.68	1.3	0	1	0	77	1	2	21	41
21-Apr	53.56	0.76	1.4	0	5	0	352	1.10	2.1	1	0	49	0	0.68	1.3	0	0	0	0	1	5	21	105
22-Apr	53.56	0.81	1.5	0	3	0	198	1.13	2.1	3	0	142	0	0.69	1.3	0	5	0	386	3	8	61	162
23-Apr	53.56	0.81	1.5	0	0	0	0	1.13	2.1	0	0	0	0	0.69	1.3	0	0	0	0	0	0	0	0
24-Apr	55.66	0.81	1.4	1	3	69	207	1.13	2.0	0	0	0	0	0.76	1.4	0	0	0	0	1	3	21	62
25-Apr	57.79	0.81	1.4	0	1	0	72	1.13	2.0	0	0	0	0	0.76	1.3	0	3	0	229	0	4	0	86
26-Apr	58.86	0.81	1.4	1	1	73	73	1.13	1.9	1	0	52	0	0.76	1.3	0	10	0	777	2	11	44	240
27-Apr	59.94	0.81	1.3	0	0	0	0	1.13	1.9	2	0	106	0	0.76	1.3	0	1	0	79	2	1	44	22
28-Apr	61.03	0.81	1.3	0	7	0	529	1.13	1.9	2	0	108	0	0.76	1.2	0	4	0	322	2	11	45	249
29-Apr	63.23	0.81	1.3	1	6	78	470	1.13	1.8	0	0	0	0	0.76	1.2	0	4	0	334	1	10	23	235
30-Apr	65.45	0.77	1.2	0	11	0	940	1.13	1.7	1	0	58	0	1.42	2.2	0	14	0	646	1	25	20	495
01-May	65.45	0.77	1.2	0	4	0	342	1.13	1.7	0	0	0	0	1.42	2.2	1	29	46	1339	1	33	20	653
02-May	67.13	1.06	1.6	0	23	0	1452	1.38	2.1	1	0	49	0	1.11	1.7	0	2	0	120	1	25	19	472
03-May	67.69	1.06	1.6	0	4	0	255	1.38	2.0	0	4	0	196	1.11	1.6	0	19	0	1154	0	27	0	514
04-May	69.97	1.12	1.6	1	7	63	439	1.40	2.0	0	1	0	50	1.57	2.2	0	50	0	2233	1	58	17	993
05-May	69.97	1.12	1.6	1	4	63	251	1.40	2.0	1	5	50	250	1.57	2.2	0	26	0	1161	2	35	34	600
06-May	68.83	1.12	1.6	0	17	0	1048	1.40	2.0	2	1	98	49	1.57	2.3	0	40	0	1758	2	58	34	977
07-May	66.57	1.03	1.6	0	22	0	1417	1.34	2.0	0	25	0	1245	1.85	2.8	0	7	0	252	0	54	0	852
08-May	64.89	1.03	1.6	1	13	63	816	1.34	2.1	0	17	0	825	1.85	2.9	0	19	0	667	1	49	15	753
09-May	64.33	0.96	1.5	0	78	0	5226	1.38	2.1	0	9	0	421	1.83	2.8	0	19	0	668	0	106	0	1637

Appendix 4. Catches of juvenile chinook salmon by rotary screw traps at Diamond Island, Nechako River, 1995.

		RST No.1:						RST No.2:						RST No.3:						Total Catch:		Weighted Average	
	River flow	Trap flow	Percent flow	Catch:		Population estimate:		Trap flow	Percent flow	Catch:		Population estimate:		Trap flow	Percent flow	Catch:		Population estimate:					
Date	m³/s	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	1+	0+	1+	0+
10-May	64.89	0.96	1.5	1	32	68	2163	1.38	2.1	1	9	47	425	1.83	2.8	0	15	0	532	2	56	31	872
11-May	66.57	0.99	1.5	0	4	0	270	1.29	1.9	0	27	0	1393	1.54	2.3	0	39	0	1690	0	70	0	1222
12-May	67.69	0.99	1.5	0	64	0	4391	1.29	1.9	0	17	0	892	1.54	2.3	0	27	0	1190	0	108	0	1918
13-May	67.69	0.99	1.5	0	49	0	3362	1.29	1.9	1	4	52	210	1.54	2.3	0	4	0	176	1	57	18	1012
14-May	68.83	0.99	1.4	1	7	70	488	1.29	1.9	0	5	0	267	1.54	2.2	0	7	0	314	1	19	18	343
15-May	68.26	0.98	1.4	1	31	70	2158	1.37	2.0	2	8	100	399	1.38	2.0	0	7	0	347	3	46	55	843
16-May	67.69	0.98	1.4	1	20	69	1380	1.37	2.0	1	10	49	494	1.38	2.0	0	3	0	148	2	33	36	600
17-May	67.13	1.04	1.5	0	14	0	904	1.41	2.1	5	10	238	477	1.53	2.3	0	6	0	263	5	30	84	506
18-May	66.01	1.04	1.6	1	0	63	0	1.41	2.1	9	1	422	47	1.53	2.3	2	2	86	86	12	3	199	50
19-May	64.89	1.04	1.6	2	0	125	0	1.41	2.2	8	2	369	92	1.53	2.4	0	4	0	169	10	6	163	98
20-May	64.89	1.04	1.6	0	4	0	250	1.41	2.2	0	8	0	369	1.53	2.4	2	4	85	169	2	16	33	261
21-May	63.23	0.93	1.5	0	8	0	545	1.19	1.9	4	12	213	638	1.76	2.8	0	37	0	1326	4	57	65	928
22-May	62.13	0.93	1.5	0	0	0	0	1.19	1.9	2	4	104	209	1.76	2.8	0	3	0	106	2	7	32	112
23-May	61.58	0.96	1.6	0	3	0	192	1.25	2.0	0	13	0	641	0.96	1.6	0	10	0	639	0	26	0	505
24-May	61.03	0.96	1.6	1	4	64	254	1.25	2.0	1	8	49	391	0.96	1.6	0	2	0	127	2	14	38	269
25-May	60.49	0.96	1.6	0	0	0	0	1.25	2.1	3	8	145	387	0.96	1.6	0	5	0	314	3	13	57	248
26-May	59.40	0.96	1.6	0	5	0	309	1.25	2.1	2	1	95	48	0.96	1.6	0	22	0	1356	2	28	37	524
27-May	58.86	0.96	1.6	1	1	61	61	1.25	2.1	1	3	47	141	0.96	1.6	0	13	0	794	2	17	37	315
28-May	58.86	0.96	1.6	0	5	0	306	1.34	2.3	0	15	0	657	1.02	1.7	0	26	0	1505	0	46	0	815
29-May	57.79	0.96	1.7	0	3	0	180	1.34	2.3	1	28	43	1205	1.02	1.8	0	17	0	966	1	48	17	835
30-May	57.26	0.96	1.7	1	0	59	0	1.34	2.3	0	11	0	469	1.02	1.8	0	19	0	1070	1	30	17	517
31-May	56.72	0.86	1.5	0	10	0	660	1.25	2.2	1	15	45	680	1.02	1.8	0	12	0	669	1	37	18	671
01-Jun	56.19	0.86	1.5	0	12	0	784	1.25	2.2	0	26	0	1167	1.02	1.8	0	22	0	1216	0	60	0	1078
02-Jun	55.66	0.74	1.3	0	6	0	454	1.09	2.0	1	16	51	817	0.87	1.6	0	21	0	1344	1	43	21	888
03-Jun	54.61	0.74	1.3	1	0	74	0	1.09	2.0	0	13	0	651	0.87	1.6	0	12	0	753	1	25	20	506
04-Jun	54.09	0.75	1.4	0	7	0	504	1.24	2.3	0	29	0	1268	1.02	1.9	0	16	0	845	0	52	0	934
05-Jun	54.61	0.75	1.4	0	4	0	291	1.24	2.3	0	22	0	971	1.02	1.9	0	20	0	1066	0	46	0	834
06-Jun	54.09	0.78	1.4	0	4	0	278	1.10	2.0	0	19	0	938	1.10	2.0	0	16	0	790	0	39	0	711
07-Jun	54.09	0.78	1.4	0	7	0	487	1.10	2.0	0	27	0	1333	1.10	2.0	0	16	0	790	0	50	0	911
08-Jun	53.04	0.82	1.6	0	4	0	257	1.20	2.3	0	8	0	355	0.99	1.9	0	12	0	645	0	24	0	423
09-Jun	52.52	0.82	1.6	0	3	0	191	1.20	2.3	0	28	0	1230	0.99	1.9	0	13	0	692	0	44	0	768
10-Jun	51.49	0.82	1.6	0	1	0	63	1.17	2.3	0	18	0	793	0.87	1.7	0	4	0	237	0	23	0	415
11-Jun	51.49	0.82	1.6	0	1	0	63	1.17	2.3	0	9	0	396	0.87	1.7	0	7	0	414	0	17	0	307
12-Jun	52.01	0.82	1.6	0	0	0	0	1.17	2.2	0	7	0	311	0.87	1.7	0	5	0	299	0	12	0	219
13-Jun	52.01	0.82	1.6	0	1	0	64	1.17	2.2	0	4	0	178	0.87	1.7	0	0	0	0	0	5	0	91
14-Jun	52.01	0.82	1.6	0	4	0	255	1.17	2.2	0	6	0	267	0.87	1.7	0	5	0	299	0	15	0	273
15-Jun	52.01	0.77	1.5	0	1	0	67	1.14	2.2	0	10	0	457	1.18	2.3	0	2	0	88	0	13	0	219
16-Jun	51.49	0.77	1.5	0	1	0	66	1.14	2.2	0	7	0	317	1.18	2.3	0	3	0	131	0	11	0	183
17-Jun	51.49	0.50	1.0	0	1	0	102	1.15	2.2	0	9	0	402	1.47	2.8	0	1	0	35	0	11	0	182
18-Jun	52.01	0.50	1.0	0	3	0	310	1.15	2.2	0	6	0	271	1.47	2.8	0	5	0	177	0	14	0	233
19-Jun	52.01	0.83	1.6	0	0	0	0	1.20	2.3	0	10	0	435	1.24	2.4	0	2	0	84	0	12	0	191

Appendix 4. Catches of juvenile chinook salmon by rotary screw traps at Diamond Island, Nechako River, 1995.

		RST No.1:						RST No.2:						RST No.3:						Total Catch:		Weighted Average	
	River flow	Trap flow	Percent flow	Catch:		Population estimate:		Trap flow	Percent flow	Catch:		Population estimate:		Trap flow	Percent flow	Catch:		Population estimate:					
Date	m³/s	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	m³/s	sampled	1+	0+	1+	0+	1+	0+	1+	0+
20-Jun	53.04	0.83	1.6	0	2	0	128	1.20	2.3	0	22	0	976	1.24	2.3	0	4	0	171	0	28	0	455
21-Jun	52.52	0.83	1.6	0	4	0	254	1.20	2.3	0	23	0	1010	1.24	2.4	0	4	0	169	0	31	0	498
22-Jun	51.49	0.79	1.5	0	4	0	261	1.18	2.3	0	12	0	526	1.29	2.5	0	0	0	0	0	16	0	253
23-Jun	50.98	0.79	1.5	0	2	0	129	1.18	2.3	0	4	0	174	1.29	2.5	0	1	0	39	0	7	0	110
24-Jun	50.98	0.79	1.5	0	0	0	0	1.21	2.4	0	2	0	84	1.19	2.3	0	0	0	0	0	2	0	32
25-Jun	50.98	0.79	1.5	0	0	0	0	1.21	2.4	0	4	0	168	1.19	2.3	0	3	0	128	0	7	0	112
26-Jun	50.98	0.80	1.6	0	0	0	0	1.15	2.3	0	1	0	44	0.82	1.6	0	0	0	0	0	1	0	18
27-Jun	49.96	0.80	1.6	0	2	0	124	1.15	2.3	0	2	0	87	0.82	1.6	0	0	0	0	0	4	0	72
28-Jun	49.96	0.80	1.6	0	2	0	124	1.15	2.3	0	3	0	130	0.82	1.6	0	0	0	0	0	5	0	90
29-Jun	49.96	0.72	1.4	0	2	0	140	1.10	2.2	0	4	0	181	1.29	2.6	0	1	0	39	0	7	0	112
30-Jun	49.96	0.72	1.4	0	0	0	0	1.10	2.2	0	9	0	407	1.29	2.6	0	3	0	116	0	12	0	193
01-Jul	49.96	0.72	1.4	0	2	0	140	1.10	2.2	0	3	0	136	1.29	2.6	0	0	0	0	0	5	0	80
02-Jul	50.98	0.72	1.4	0	0	0	0	1.10	2.2	0	5	0	231	1.29	2.5	0	2	0	79	0	7	0	115
03-Jul	51.49	0.72	1.4	0	0	0	0	1.10	2.1	0	0	0	0	1.29	2.5	0	2	0	80	0	2	0	33
04-Jul	49.45	0.72	1.4	0	0	0	0	1.10	2.2	0	1	0	45	1.29	2.6	0	0	0	0	0	1	0	16
05-Jul	47.43	0.72	1.5	0	0	0	0	1.10	2.3	0	1	0	43	1.29	2.7	0	0	0	0	0	1	0	15
06-Jul	45.45	0.72	1.6	0	1	0	63	1.10	2.4	0	2	0	82	1.29	2.8	0	1	0	35	0	4	0	58
07-Jul	43.97	0.72	1.6	0	0	0	0	1.10	2.5	0	0	0	0	1.29	2.9	0	0	0	0	0	0	0	0
08-Jul	44.46	0.65	1.5	0	0	0	0	1.06	2.4	0	0	0	0	0.87	2.0	0	0	0	0	0	0	0	0
09-Jul	45.45	0.65	1.4	0	0	0	0	1.06	2.3	1	0	43	0	0.87	1.9	0	0	0	0	1	0	18	0
10-Jul	47.93	0.65	1.4	0	0	0	0	1.06	2.2	0	0	0	0	0.87	1.8	0	0	0	0	0	0	0	0
11-Jul	47.93	0.65	1.4	0	0	0	0	1.06	2.2	0	0	0	0	0.87	1.8	0	0	0	0	0	0	0	0
12-Jul	52.52	0.65	1.2	0	0	0	0	1.06	2.0	0	0	0	0	0.87	1.7	0	0	0	0	0	0	0	0
13-Jul	64.89	0.65	1.0	0	0	0	0	1.06	1.6	0	0	0	0	0.87	1.3	0	0	0	0	0	0	0	0
Total				17	560	1131	37927			64	655	3081	30532			9	742	371	36993	90	1957	1590	34372
Total				17	663	1131	44870			68	747	3291	34906			9	1153	370.6	57868	94	2563	1660	45025