Canadian Manuscript Report of

Fisheries and Aquatic Sciences 2619

2002

RESULTS OF A JUVENILE PRODUCTION STUDY CONDUCTED ON THE KLINAKLINI RIVER DURING 2001

by

R.E. Diewert, D.A. Nagtegaal, and E.W. Carter

Fisheries and Oceans Canada

Science Branch, Pacific Region

Pacific Biological Station

Nanaimo, British Columbia

V9T 6N7

Cat. No. Fs 97-4/2619E ISSN 0706-6473

Correct citation for this publication:

Diewert, R.E., D.A. Nagtegaal, and E.W. Carter. 2002. Results of a juvenile production study conducted on the Klinaklini River during 2001. Can. Manuscr. Rep. Fish. Aquat. Sci. 2619: 57 p.

List of Tables

List of Figures

ABSTRACT

Diewert, R.E., D.A. Nagtegaal, and E.W. Carter. 2002. Results of a juvenile production study conducted on the Klinaklini River during 2001. Can. Manuscr. Rep. Fish. Aquat. Sci. 2619: 57 p.

In 2001, the Biological Sciences Branch, Pacific Biological Station, began a study of juvenile chinook salmon (*Oncorhynchus tshawytscha*) productivity in the Klinaklini River. Major components of this study included: i) estimating the total production of juvenile chinook and coho from Devereux Creek and the Klinaklini River, ii) evaluating the potential of applying coded wire tags to chinook smolts, iii) indexing abundance and determining out migration timing for all juvenile salmon and iv) collecting biological and environmental information. Using rotary screw trap catch data, a simple stratified mark recapture design was used to estimate the total number of juvenile chinook and coho migrating downstream out of Devereux Creek and the Klinaklini River. The estimated production of chinook fry and smolts from Devereux Creek was 1,314,179 (95 %CL: 1,184,036 to 1,444,322) and 68,577 (95% CL: 47,288 to 89,866), respectively. The estimated number of coho fry emigrating from Devereux Creek was 1,256,701 (95% CL: 99,1183 to 1,522,219). An estimate of coho smolt production could not be made as trap efficiency was not determined for coho smolts. The estimated number of chinook fry and smolts migrating past the rotary screw trap site in the Klinaklini River was 1,197,042 (95% CL: 621,262 to 1,772,822) and 80,366, respectively. No confidence interval was calculated for the chinook smolt estimate as only one trap efficiency trial was conducted. Also, as there were no efficiency trials conducted for coho in the Klinaklini River, population estimates could not be produced. Over ten thousand chinook smolts were captured at three trap sites in the Klinaklini system over the course of the study. It was determined that trap modifications could result in a significant increase in chinook smolt catch thus providing an adequate sample for a future coded-wire tagging study. Trap catches and migration timing curves are presented for all juvenile salmon along with extensive biological and environmental data.

RÉSUMÉ

Diewert, R.E., D.A. Nagtegaal, and E.W. Carter. 2002. Results of a juvenile production study conducted on the Klinaklini River during 2001. Can. Manuscr. Rep. Fish. Aquat. Sci. 2619: 57 p.

En 2001, la Direction des sciences biologiques de la Station de biologie du Pacifique a lancé une étude sur la productivité des saumons quinnats (*Oncorhynchus tshawytscha*) juvéniles dans la rivière Klinaklini. Les principales composantes de cette étude sont les suivantes : i) estimation de la production totale de quinnats et de cohos juvéniles du ruisseau Devereux et de la rivière Klinaklini, ii) évaluation du potentiel d'implantation de micromarques codées chez les smolts de quinnats, iii) indexation de l'abondance et définition du calendrier de dévalaison pour tous les jeunes saumons, et iv) collecte de données biologiques et environnementales. À partir des données fournies par les captures réalisées dans un piège rotatif à vis sans fin, nous avons établi un plan stratifié de marquage-recapture pour estimer le nombre total de quinnats et de cohos juvéniles en dévalaison dans le ruisseau Devereux et la rivière Klinaklini. Nous avons estimé la production d'alevins et de smolts de quinnats du ruisseau Devereux respectivement à 1 314 179 (IC 95 % : 1 184 036 à 1 444 322) et 68 577 (IC 95 % : 47 288 à 89 866). Le nombre d'alevins de cohos issus du ruisseau Devereux a été estimé à 1 256 701 (IC 95 % : 99 1183 à 1 522 219). Il n'a pas été possible d'estimer la production de smolts de cohos car l'efficacité du piège n'avait pas été déterminée pour ces smolts. Nous avons estimé le nombre d'alevins et de smolts de quinnats en dévalaison au piège rotatif sur la rivière Klinaklini respectivement à 1 197 042 (IC 95 % : 621 262 à 1 772 822) et à 80 366; l'intervalle de confiance n'a pas été calculé pour l'estimation des smolts de quinnats, car un seul essai d'efficacité du piège a été réalisé. Par ailleurs, aucun essai d'efficacité n'a été effectué non plus pour les cohos dans la Klinaklini, de sorte qu'il a été impossible de produire des estimations de la population. Plus de 10 000 smolts de quinnats ont été capturés aux trois stations de la Klinaklini pendant l'étude. Nous avons observé que des modifications au piège devraient permettre d'augmenter nettement les captures de smolts de quinnats, ce qui fournirait un échantillon satisfaisant pour une étude future de marquage avec des micromarques codées. Nous présentons le bilan des prises réalisées au piège et les courbes du calendrier de migration pour tous les saumons juvéniles ainsi qu'une série de données biologiques et environnementales.

INTRODUCTION

Chinook stocks are invaluable to both the commercial and recreational fisheries of the Pacific Northwest (Collicut and Shardlow 1995). In spite of protective measures, chinook salmon abundance has continued to decline. This trend has resulted in the recent addition of chinook to the list of threatened and endangered species in the United States (Waples 1991). The problem of declining stocks is similarly serious on the West Coast of Canada, and has potential ramifications regarding the sustainability of British Columbia's fishing industry (Argue et al. 1983). In an effort to raise populations to historical levels, a chinook rebuilding plan was initiated in 1985 through the Pacific Salmon Treaty between the United States and Canada (TCCHINOOK 87-4). This plan established a mandate requiring both parties to stop the decline in escapements of naturally-spawning chinook stocks and attain escapement goals in selected lower Strait of Georgia (Cowichan, Nanaimo, Squamish) and upper Strait of Georgia (Klinaklini, Kakweiken, Nimpkish, Wakeman, and Kingcome) indicator stocks. In addition, various "key streams" were selected to represent the overall status of chinook bearing streams along the BC coast. These key streams (Robertson, Quinsam/Campbell, Kitsumkalem, Harrison, and Big Qualicum) provide ongoing information to fisheries managers including accurate estimates of escapement and the relative contribution of hatchery and naturally reared production to these stocks.

While salmonid enumeration studies have been conducted on the lower Klinaklini watershed since 1949 assessment methods have varied. Most evaluations have consisted of stream walks and overflight counts of the few clear tributaries in a largely clouded glacial system. Clear streams include Devereux (also known as Mussel Creek), Icy, Dice, and Jump creeks. All five salmonid species are supported by the Klinaklini system as well as steelhead (*O. mykiss*), cutthroat (*O. clarki*), and bull trout (*S. confluentus*), Dolly Varden char (*Salvelinus malma*), mountain whitefish (*Prosopium williamsoni*), prickly sculpin (*Cottus asper*), redside shiner (*Richardsonius balteatus*), longnose sucker (*Catostomus catostomus*), and lamprey ammocetes (Rimmer and Axford 1990).

In 1981, the Department of Fisheries and Oceans began a study to determine the viability of building salmonid enhancement facilities on several tributaries to Knight Inlet. Aquatic Resources Ltd. conducted spawning studies and collected baseline information for pink (*O. gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), coho (*O. kisutch*) and chinook from Glendale Creek, the Ahnuhati River, the Klinaklini River, and Tom Browne Creek (Fielden and Slaney 1982). E.V.S. Consultants (Whelen and Morgan 1984) continued this work in 1983. Throughout this period, physical data, salmonid population biological characteristics, and spawning habitat biophysical data were collected. Preliminary surveys of juvenile salmonid habitat utilization and evaluations of potential rearing areas were completed on all study watercourses (Fielden et al. 1985). Enhancement plans included a pink spawning channel at Glendale Creek, a chum/pink spawning channel on the Ahnuhati River, juvenile chinook and coho outplanting to the Ahnuhati and Klinaklini rivers, and coho outplanting to Tom Browne and Glendale creeks.

As a result of this work, a pilot enhancement facility was built on Devereux Creek in 1985 and chinook and coho broodstock were collected. Approximately 265,000 chinook eggs were incubated of which 63% were released as coded-wire tagged fry and 24% as 4 to 5 g tagged smolts. For various reasons the facility was dismantled the following year. A total of five coded-wire tagged chinook were recovered from 1987-1989; three from Alaskan fisheries and two from northern BC sport and troll fisheries.

Renewed interest by DFO in 1997 resulted in a further and ongoing stock assessment study of chinook in the Klinaklini system. In 2001, the scope of the study was expanded to include an assessment of juvenile production. This report presents the results of the juvenile assessment component of the project with objectives including:

1. estimation of the total production of juvenile chinook and coho from Devereux Creek and the Klinaklini River,
2. evaluation of the potential for applying coded-wire tags to chinook smolts to attain information on survival rates and catch distribution,
3. evaluation of the suitability of using rotary screw traps to index the abundance and out migration timing of chinook, coho, chum, pink, and sockeye juveniles,
4. collection of biological data from all salmonids, and
5. recording environmental information.

METHODOLOGY

STUDY AREA

Knight Inlet is a mainland fjord located approximately 220 km north of Vancouver on the British Columbia coast. The inlet extends approximately 120 km inland from Johnstone Strait (Figure 1). The fjord itself is steep sided and averages 3 km in width with depths to 530 m. The Knight Inlet watershed is bounded by mountains on either side and receives runoff from a 7,800 km^2 area.

The Klinaklini River is the largest river system in the Mainland Coast Planning unit and is composed of the east and west arms which meet at a confluence 25 km upstream from the estuary. The west Klinaklini is a fairly short river section, which is fed directly by the Klinaklini glacier. The east Klinaklini passes through a canyon area and then extends into the BC interior. An extremely braided channel containing a multitude of sand and gravel bars, meanders, oxbows and side channels characterizes the lower 30 km section of the river. The Klinaklini River is a cold, glacial system and is the main contributor of glacial flour to Knight Inlet.

Devereux Creek is a 19 km long clearwater stream, which joins the Klinaklini River approximately 11 km from the mouth (Figure 2). The creek is stabalized by a series of lakes and drains a watershed of 74 km^2. A section of rapids below Devereux Lake drops 120 m over a distance of 1.75 km and constitutes a potential migration barrier to pink, chum, chinook, and some sockeye (Rimmer and Axford 1990). The lower reaches of the creek yield a gentle gradient with shallow runs connecting deeper pools, offering excellent rearing habitat for juvenile salmonids.

Logging roads provided access to Devereux Creek and the lower Klinaklini River. These roads were maintained in excellent condition, as they were the main lines for an active logging operation. International Forest Products operated a camp (Wahkash Contracting) along a side-channel of the Klinaklini River situated 2 km upstream from the estuary. The camp had a bunkhouse, several panabode homes, cookhouse, communication equipment (satellite phone), and a large workshop repair facility. This camp provided an excellent base for our field operations.

FISH CAPTURE

Auger, or rotary screw traps, were deployed in Devereux Creek and in the Klinaklini River to capture juvenile salmon migrating downstream. The Devereux Creek trap was situated under the Klinaklini East main bridge approximately 1 km from the confluence with the Klinaklini River. The trap deployed in the Klinaklini mainstem was situated immediately downstream of the Million Dollar Bridge, on the left bank of the river (Figure 2).

The cones of the rotary screw traps utilized in this study were 2.4 m in diameter. As the cones rotated in the water column migrating fish were moved, along with the volume of water sampled by the cone, through to a live box situated at the downstream end of the trap. Traps were checked at least once a day and all fish captured were enumerated by species. Length and weight data were collected from a subsample of all chinook and coho captured. Scale smears were taken from chinook and coho smolts for later age analysis. Environmental data including river flow rate, trap rpm, water temperature, depth and clarity and general weather conditions were recorded daily.

A portion of the chinook and coho juveniles captured in each rotary screw trap were marked with a bismark brown dye and released upstream from the traps. The proportion of the marked releases recaptured in the subsequent time period was used to determine trap efficiency.

A fence trap was installed on Dice Creek near the confluence with the Klinaklini River. The trap consisted of fence panels constructed of hardware cloth stretched over 2x4 frames that directed fish into a holding box. Fish captured in the trap were sampled as outlined above.

POPULATION ESTIMATES

A mark-recapture technique in which a stratified design with sampling at one location was used to estimate the abundance of juvenile salmon migrating downstream. The procedure as outlined in Carlson et al. (1998) is reproduced below. The method consists of counting juvenile salmon captured at a sampling site and releasing marked individuals back into the population at an upstream location. The marked individuals were subsequently recovered and counted to estimate capture probability (trap efficiency), which was used to estimate total abundance for a segment of the population. The procedure was temporally stratified such that each trap efficiency trial was discretely paired with one capture period. This approach accounts for potential temporal changes in capture probability.

The following notation definitions apply to all subsequent equations:

$\hat{U}_h$ = total population size in h, excluding marked releases and minus observed mortality,
$v(\hat{U}_h)$ = the approximately unbiased variance estimate of $\hat{U}_h$,
h = stratum index (capture period and a corresponding trap efficiency trial),
M_h = number of marked fish released in stratum h,
m_h = number of marked fish recaptured in h,
u_h = number of unmarked fish recaptured in h,

The approximately unbiased estimate of the stratum population size is:

$$\hat{U}_h = \frac{u_h(M_h + 1)}{m_h + 1}$$

An approximately unbiased estimate of the variance of the stratum population is:

$$v(\hat{U}_h) = \frac{(M_h + 1)(u_h + m_h + 1)(M_h - m_h)u_h}{(m_h + 1)^2 (m_h + 2)}$$

The total population estimate $\hat{U}$ is the sum of $\hat{U}_h$ across all strata while the total variance estimate $v(\hat{U})$ is the sum of $v(\hat{U}_h)$. An approximate 95% confidence interval for $\hat{U}$ is:

$$\hat{U} \pm 1.96 \bullet \sqrt{v(\hat{U})}$$

RESULTS

FISH CAPTURE

The rotary screw traps (RST) operated efficiently as long as there was sufficient flow to ensure that the drums rotated and moved fish to the holding tanks. Leads were installed at the Devereux Creek sampling site to direct a higher proportion of migrating toward the rotary screw trap. This also increased water flow into the drum, which accelerated rotational speed and improved trap efficiency. The RST installed in the Klinaklini River was periodically moved to achieve ideal drum rotation.

The fence trap installed on Dice Creek was designed to provide a complete census of all downstream migrants. However, modifications made to the trap box on April 17 allowed fry to escape through large mesh screens. This adjustment was made in an attempt to reduce the rate of holding box mortality on smaller fish due to predation. On April 24, high creek flows caused extensive damage to several panels and the fence was removed. Due to these events, a complete count of downstream migrants was not attained.

The Devereux Creek RST was in operation from February 25 to June 13. Most species captured by the trap showed little or no movement at the beginning of the program indicating that the start of out migration occurred during program operation. Chinook fry were the exception to this pattern as high catches were recorded on the first day of sampling (789 fish). Chinook and coho continued to be caught until the end of the project although in low numbers. A total of 223,976 chinook fry, 5,080 chinook smolts, 79,888 coho fry, 547 coho smolts, as well as 58,656 pink, 19,124 chum and 1,228 sockeye juveniles were captured by the RST deployed in Devereux Creek (Table 1). The daily catch of non salmon species is presented in Table 2. Run timing for each species, based on Devereux Creek RST catch data, is presented in Figures 3a to 3c. The maximum catch of chinook fry occurred on April 10 (11,353 fish) while coho fry catch peaked on April 24 (7,990 fish) (Figure 3a). The maximum catch of chinook smolts occurred on May 15 (304 fish) while coho smolt catch peaked on May 5 (48 fish) (Figure 3b). Temporal catch patterns for pink, chum and sockeye are presented in Figure 3c.

The Klinaklini River RST was in operation from February 28 to June 13. The slightly later deployment date was a result of excess ice in the river. As in Devereux Creek, most species showed little or no movement at the beginning of the program. Once again, however, chinook fry were the exception to this pattern indicating an earlier start to migration for this component. Chinook and coho continued to be caught until the end of the project although in low numbers. A total of 22,576 chinook fry, 4,361 chinook smolts, 6,183 coho fry, 458 coho smolts, as well as 702 pink, 2,338 chum and 30 sockeye juveniles were captured by the RST deployed in the Klinaklini River (Table 3). The daily catch of non salmon species is presented in Table 4. Run timing for each species, based on Klinaklini River RST catch data, is presented in Figures 4a to 4c. The maximum catch of chinook fry occurred on April 10 (1,000 fish) while coho fry catch peaked on April 29 (594 fish) (Figure 4a). The maximum catch of chinook smolts occurred on May 13 (446 fish) while coho smolt catch peaked on May 2 (30 fish) (Figure 4b). Temporal catch patterns for pink, chum and sockeye are presented in Figure 4c.

The Dice Creek trap was in operation from February 28 to April 24. All species captured by the trap showed little or no movement at the beginning of the program indicating that the start of out migration occurred during program operation. High flows caused damage to several fence panels resulting in the removal of the trap before the completion of migration. A total of 4,701 chinook fry, 588 chinook smolts, 9,493 coho fry, 262 coho smolts, as well as 19,085 pink and 5,942 chum juveniles were captured by the Dice Creek trap (Table 5). No sockeye juveniles were captured in Dice Creek. The catch of non salmon species is presented in Table 6. Run timing for each species, based on Dice Creek trap catch data, is presented in Figures 5a to 5c. The maximum catch of chinook fry occurred on April 16 (679 fish), the last day that the trap was set up to capture fry. Coho fry catch reached a maximum on March 12 (1,382 fish) with a second peak occurring on April 10 (1,324 fish) (Figure 5a). The maximum catch of chinook smolts occurred on April 18 (111 fish) while coho smolt catch peaked on March 24 (25 fish) (Figure 5b). Temporal catch patterns for pink and chum are presented in Figure 5c.

BIOLOGICAL SAMPLING

Weekly length and weight data were collected from a subsample of chinook and coho captured at each of the trap sites. Statistical analysis revealed that there was a significant difference in the size of chinook fry based on sampling location (ANOVA: $F = 46.573$; $P < .001$). Chinook fry captured in the Klinaklini River trap were significantly larger than chinook fry from Devereux Creek (t-test: $t = 5.280$; $P < .05$), which were in turn larger than Dice Creek fry (t-test: $t = 8.581$; $P < .05$) (Table 7a, Figure 6a). While there was no difference between the length of chinook smolts from Dice and Devereux creeks (t-test: $t = 0.0544$; $P < .05$), both systems produced larger smolts than those captured in the Klinaklini River (t-test: $t=13.881$; $P< 0.05$) (Table 7a; Figure 6a). Statistical analysis revealed that there was a significant difference in the size of coho fry captured at the three trap sites (ANOVA: $F = 26.767$; $P < .001$). Coho fry from the Klinaklini River were significantly larger than coho fry from Devereux Creek (t-test: $t = 2.060$; $P < .05$), which were in turn larger than Dice Creek fry (t-test: $t = 6.951$; $P<.05$) (Table 7b, Figure 6b). However, coho smolts revealed a different pattern as samples from the Klinaklini River were significantly smaller than those from Dice Creek (t-test: $t = 3.138$; $P < .05$) which were in turn smaller than smolts from Devereux Creek (t-test: $t=2.974$; $P < .05$)) (Table 7b, Figure 6b).

Length and weight data were stratified by 10 day periods to assess changes in fry and smolt size over time. Chinook fry from Devereux Creek and the Klinaklini River became significantly larger over the duration of the project (ANOVA: $F=17.518$, $P<0.05$; $F=20.716$, $P<0.05$, respectively). Devereux Creek chinook fry length averaged 38.85 mm during the first sampling period and 52.50 mm during the last period. Klinaklini River chinook fry averaged 38.75 mm during the first sampling period and 56.16 mm during the last period. While a similar trend was observed in the Dice Creek sample the relationship was not statistically significant. This was likely due to a lack of sampling in the later periods (Table 7a, Figure 7a). Chinook smolts sampled from the Klinaklini River became significantly larger over time (ANOVA: $F=11.939$, $P<0.05$). Klinaklini chinook smolts averaged 88.79 mm in the first sampling period during which they were captured and 103.09 mm during the last period. The same trend was not evident in the Devereux Creek samples and the Dice Creek sample size was too small to test (Table 7a, Figure 7b). There was no apparent relationship between sample period and coho fry or smolt size at any of the sampling sites (Table 7b, Figure 7c,7d)

A total of 67 chinook smolts captured at the Klinaklini River RST site, were aged by scale analysis. Ages ranged from 0.0 (brood year 2000) to 2.0 (brood year 1998) and were dominated by 1.0 (68.7%) fish (Table 8a). The age notation follows the European format with freshwater years followed by salt water years, the sum of which gives total age. It should be noted that technicians analysing the scale samples suggested that most of the chinook aged as 2.0

fish were likely coho misidentified as chinook. This may be the case as analyses of the scales of adult spawners during recent studies did not indicate a 2 year freshwater life history type for chinook in the Klinaklini system (Diewert et al. 2002, 2001). A total of 124 coho smolts captured at the Klinaklini RST site were aged by scale analysis. Ages ranged from 0.0 to 2.0 and were dominated by 1.0 (83.1%) fish (Table 8a).

A total of 99 chinook and 132 coho smolts captured at the Devereux Creek RST site were aged by scale analysis. Ages ranged from 0.0 to 2.0 for both species with the 1.0 age class dominating as 74.0 % and 91.7 % of the samples were age 1.0 for chinook and coho, respectively (Table 8b).

ENVIRONMENTAL SAMPLING

Environmental data collected at the trap sites included water temperature, secchi depth or clarity code, flow rate, rotary screw trap RPM, river depth and weather condition. Devereux Creek water temperature ranged from 1.0 ^{0}C to 13.0 ^{0}C and averaged 6.8 ^{0}C. Water temperature exhibited a discontinuous increase over the course of the study with maximums achieved on June 7 and 13. Devereux Creek water depth varied considerably ranging from minus 2.0 cm to 55.0 cm and averaging 15.3 cm (Table 9, Figure 8a). All other environmental data collected at the Devereux Creek RST site are presented in Table 9.

The Klinaklini River is largely influenced by glacial melt during warmer weather periods. This factor results in consistently low river temperatures and increased flow during the spring and summer months. During the current study, river temperature ranged from 0.5 ^{0}C to 9.0 ^{0}C and averaged 4.5 ^{0}C. Water temperature increased from late February to late May, and then decreased toward the termination of the study in mid June. Klinaklini River depth ranged from 270.0 cm to 518.0 cm and averaged 355.2 cm. Depth was relatively constant at a minimal level through to the end of April and then increased toward the termination of the study as glacial run off increased (Table 10, Figure 8b). Water clarity was recorded in the form of secchi depth, which ranged from a high of 81.5 at the start of the study to a low of 21.5 cm at program termination when glacial runoff increased turbidity. Secchi depth measurements averaged 44.0 cm over the course of the study (Table 10).

Dice Creek water temperature ranged from 1.5 ^{0}C to 7.0 ^{0}C and averaged 3.8 ^{0}C. A discontinuous increase occurred over the sampling period with the minimum recorded on March 5 and the maximum on April 22. Water depth in Dice Creek ranged from 40.0 cm to 84.0 cm and averaged 51.6 cm. Depth was relatively consistent until the last week of sampling when a dramatic increase occurred as a result of heavy rainfall (Table 11, Figure 8c). The collection of environmental data was terminated on April 30 shortly after the trap was removed from Dice Creek.

POPULATION ESTIMATES

A simple stratified mark recapture design was used to estimate the total population of juvenile chinook and coho migrating downstream out of Devereux Creek and the Klinaklini River. The technique accounts for potential temporal changes in capture probability with a fairly modest assumption of stratum consistency (Carlson et al. 1998). A total of seven trap efficiency trials were carried out for chinook fry in Devereux Creek. Each efficiency trial corresponded to one downstream capture period or stratum. The recovery rate of marked fish and the total number of captures was used to estimate the size of the population for that segment of the migration. Capture efficiencies for chinook fry in Devereux Creek ranged from a low of 7.9 % in the first sampling period to a high of 37.9 % in the last stratum (Table 12). The total estimated out migration of chinook fry from Devereux Creek was 1,314,179 with 95 % upper and lower confidence limits of 1,444,322 and 1,184,036, respectively (Table 13a).

A total of four trap efficiency trials were carried out for chinook smolts in Devereux Creek. Capture efficiencies ranged from a low of 1.7 % in the third period to a high of 9.2 % in the first stratum (Table 12). The total estimated out migration of chinook smolts from Devereux Creek was 68,577 with 95 % upper and lower confidence limits of 89,866 and 47,288, respectively (Table 13a).

A total of five trap efficiency trials were carried out for coho fry migrating out of Devereux Creek. Capture efficiencies ranged from a low of 3.4 % in the third period to a high of 11.5 % in the last stratum (Table 12). The total estimated out migration of coho fry from Devereux Creek was 1,256,701 with 95 % upper and lower confidence limits of 1,522,219 and 991,183, respectively (Table 13a). No coho smolts were marked and released in Devereux Creek and therefore, no population estimate was possible for this life history stage.

Trap efficiency trials were less frequent in the Klinaklini River due to low catches and scheduling difficulties. A total of three trap efficiency trials were carried out for chinook fry migrating downstream in the Klinaklini River. Capture efficiencies ranged from a low of 0.3 % in the last period to a high of 2.0 % in the middle stratum (Table 12). The total estimated downstream migration of chinook fry in the Klinaklini River was 1,197,042 with 95 % upper and lower confidence limits of 1,772,822 and 621,262, respectively (Table 13b). As there was only one release of marked chinook smolts in the Klinaklini River, a stratified estimator could not be used to determine the total population size. As a result, the trap efficiency derived from the single release was applied to the total catch for the study period to estimate the downstream migration of chinook smolts in the Klinaklini River. Following this methodology, the chinook smolt estimate was 80,366 fish (Table 13b). Confidence limits were not calculated for this estimate.

No coho were marked and released in the Klinaklini River to determine trap efficiency. As a result, population estimates were not produced for Klinaklini River coho.

Technicians analysing scale samples suggested that most of the chinook aged as 2.0 fish were likely coho misidentified as chinook. As it was not possible to determine the magnitude of the species identification error no post season adjustments were made to the data. While the total estimates for each size category of juveniles is valid, the species breakout may not be accurate and it is likely that the estimate of chinook smolts is biased high.

DISCUSSION

FISH CAPTURE

The rotary screw traps deployed in Devereux Creek and the Klinaklini River were successful in capturing juvenile chinook, coho, pink, chum and sockeye migrating downstream but the rate of capture varied considerably. River discharge effects the rotational speed of the cone of a rotary screw trap, which greatly influences capture efficiency (Frith et al. 1995). Other research has indicated that there can be considerable differences in trap efficiency between species, and between different size classes of fish (Ricker 1975, Roper and Scarnecchi 1998, Thedinga et al. 1994). As a result of these observations, our efficiency trials were conducted separately for chinook and coho fry and smolts over the duration of the study. Trap efficiencies at the Devereux Creek site were higher for smaller fish. This pattern was not evident for the Klinaklini River trap but since there was only one chinook smolt release, the strength of the comparison is limited (Table 12).

The Devereux Creek rotary screw trap (RST) was more efficient in capturing juveniles in every size class than the trap deployed in the Klinaklini River. This is likely due to the high proportion of the stream sampled by the Devereux trap. The cone of the RST deployed in Devereux Creek reached close to the stream bed and covered approximately one third of the creek width. In contrast, the Klinaklini River at the RST site is over 50 m wide and has a maximum depth of approximately 5 m. As a result, the Klinaklini River trap sampled a much lower proportion of the downstream migrant population.

The fence trap installed in Dice Creek was successful at capturing all downstream migrants during the early portion of the study. As the project progressed, trap box mortality rates increased for chinook fry. This mortality was largely associated with the presence of coho smolts and other larger predatory fish. To alleviate the concern, a larger mesh screen was installed to allow fry to escape from the holding box. As a result, fry enumeration was no longer possible. Slightly thereafter, a sharp increase in Dice Creek discharge due to heavy precipitation resulted in irreparable damage to fence panels resulting in the termination of trapping. If this portion of the study is to continue, a more robust fence design will be required. Also, modifications to the holding box to provide refuge areas for smaller fish may allow continued trapping of fry while minimizing predation.

One of the objectives of this project was to determine if a sufficient number of chinook smolts could be captured for a coded-wire tagging study. Over ten thousand chinook smolts were captured at the three trap sites over the course of the current project. While this may be on the low side for a tagging study, it should be possible to modify the traps to increase sampling efficiency for smolts. For example, the Devereux Creek trap site seems to be an ideal location for a full or partial fence. If this type of gear were deployed and even 25% of the emigrant chinook smolts captured, then approximately 20,000 would be available for coded-wire tagging. This would likely provide an adequate tag release group for survival and exploitation rate studies.

The seasonal pattern of trap catches reflects the out-migration timing for each species. As chinook fry were captured during the first day of trap operation it is clear that downstream migration began before project initiation. Fielden et al. (1985) began juvenile trapping studies in Devereux Creek and in the Klinaklini River in early April and determined that they had missed the peak of chinook fry out migration. If future studies aim to monitor the entire chinook fry migration then an earlier start to trapping may be necessary.

BIOLOGICAL SAMPLING

Results indicate that chinook and coho fry captured in the Klinaklini River trap were larger than fry from Devereux and Dice creeks. Fielden et al. (1985) found a similar pattern for chinook fry indicating that stock specific differences in fry size due to genetic variation or rearing conditions likely exists in the Klinaklini system. However, that study reported that Devereux Creek coho fry were larger than coho fry captured in the Klinaklini River. This result may reflect inter-annual variability in coho fry size or may be a result of gear selectivity as catches from inclined plane traps and fences were compared in the earlier project (Fielden et al. 1985).

Chinook and coho smolts captured in the Klinaklini River trap were smaller than smolts from Devereux and Dice creeks. It seems that the tributary systems, and Devereux Creek in particular, provide prime habitat for juveniles that rear in freshwater before migrating to the ocean. The Devereux Creek system contains several lakes, swamp areas and mainstem pools that are excellent rearing areas, especially for juvenile coho. Fielden et al. (1985) conducted rearing studies on several tributaries in the Klinaklini system and found the largest juvenile coho in Devereux and Laura lakes followed closely by those rearing in the Devereux Creek mainstem. They also found juvenile chinook rearing in Devereux Creek, but in much lower abundance.

Chinook fry from all three sampling sites became larger over the duration of the study. Fielden et al. (1985) found that chinook fry from several Knight Inlet systems showed a similar pattern with an initial period of little or no growth followed by an increase in length and weight with time. This pattern likely reflects a change from fry to fingerling migrants, which normally range from 50 to 120 mm in fork length, and have been actively feeding for some time (Healey 1991). The downstream movement of chinook fingerlings may represent a redistribution to more suitable wintering habitat or a response to competition with coho or stream type chinook (Healey 1991).

Coho fry showed no apparent relationship between sample period and size for any of the trap sites. This may be the result of smaller coho being forced out of prime rearing habitat due to competition for space with larger fry (Chapman 1966). When densities are high, differences in the size of juvenile coho leads to the emigration of smaller members of the cohort (Sandercock 1991). If these interactions occur over the course of the spring, then smaller fry will continue to be captured as they move out of the system.

Based on trap catch and fish size data, the vast majority of juvenile chinook migrating out of Devereux and Dice creeks were fry. These fish were either heading out of the Klinaklini system as "ocean type" chinook or were destined for a season of mainstem rearing before leaving the system the following spring as "stream type" chinook. Fielden et al. (1985) concluded that the majority of Devereux Creek chinook juveniles move into the mainstem to rear. This was supported by the fact that relatively few chinook smolts were captured migrating out of the creek and extensive rearing surveys revealed only 3,700 chinook fry remaining in the creek over the summer. Murphy et al. (1997) determined that despite limited spawning habitat, lower river areas often have abundant low-gradient habitats suitable for rearing. This pattern is especially evident in glacial rivers because of their extremely high sediment loads, which strongly affects habitat formation. Their study of the Taku River revealed that lower-river areas were essential for juvenile salmon rearing and contributed in a significant way to the river's total salmon production. It is likely that a similar condition exists in the Klinaklini River system.

Analysis of the scales of adult chinook returning to spawn in the Klinaklini system over the past four years has revealed that the proportion of stream type fish varies annually and has ranged from 41 % stream type in 1998 (Sturhahn and Nagtegaal 1999) to 87 % in 1999 (Diewert et al. 2001). It has been suggested that the early growth rate of juveniles dictates which life history strategy is employed. If food sources do not limit growth then smoltification begins early with juveniles entering the ocean in their first year of life as ocean types (DFO, Fraser River Action Plan 1995). Inter annual variability in freshwater habitat quality likely influences the life history strategy of juvenile chinook in the Klinaklini system.

Coho typically rear one, or occasionally two years in freshwater before migrating to the ocean. The large out-migration of coho fry from Devereux and Dice creeks indicates that many juveniles rear in the Klinaklini mainstem or in other tributaries downstream of their natal systems. Whether these fish are being displaced due to competitive interactions or exhibiting a preference for a different rearing habitat, it is clear that the Klinaklini mainstem plays an important role in juvenile coho life history.

POPULATION ESTIMATES

A Peterson mark-recapture estimate applied just one time to a migrating juvenile population may violate at least one important assumption: constant probability of recapture. This could be due to several factors, including changes in stream flow, temporal variation in the age structure and size of migrants, and changes in sampling methods (Carlson et al. 1998). A simple stratified mark-recapture design accounts for potential temporal changes in capture probability with a fairly modest assumption of stratum consistency (Carlson et al. 1998). Using this estimation technique, the emigrant population of Devereux Creek chinook and coho fry and chinook smolts was determined. For the Klinaklini mainstem populations, only chinook fry numbers were determined using the stratified estimator.

The total estimated out-migration of chinook fry from Devereux Creek was 1,314,036. Fielden et al. (1985) used potential egg deposition and estimated survival rates to determine that approximately 840,000 chinook fry were produced in Devereux Creek in 1985. This value is within approximately 35 % of our estimate, well within the range of expected inter-annual variation due to changing adult escapement levels and variable egg to fry survival rates.

Assessing the accuracy of population estimates requires an examination of the assumptions underlying the method utilized. For each stratum, a slight modification of the standard Peterson mark-recapture assumptions must apply (e.g. Ricker 1975; Seber 1982). The assumptions, as outlined in Carlson et al. (1998), are reproduced below with a brief discussion on how they were met in the current study.

Assumption 1 – the population is closed; therefore, the abundance remains constant. This assumption was likely met in the current study as any changes to the population size over the course of the study were likely negligible. All mortality observed during marking, capture and handling was known and removed from the estimate. However, as there was some movement of chinook fry in Devereux Creek and in the Klinaklini River before the traps were installed a small portion of the population was not available for capture. While this indicates that the chinook fry population was not completely closed, the resulting bias was likely slight as the run timing curves indicate that only a very small segment of the chinook fry population moved past the trap site prior to sampling. To avoid this situation, future studies should begin trap operation as early as possible.

Assumption 2 – all fish have the same probability of being marked or all fish have the same probability of being examined for marks. This encompasses potential problems with random sampling, mixing of marked and unmarked fish, and variable catchability due to size or marking effects. To satisfy this assumption, size specific efficiency trials were carried out for chinook and coho to address differences in capturability. Also, marked fish were released at multiple locations well upstream of the trap site and along both banks to enhance mixing with the unmarked population.

Assumption 3 – the probability of capture is constant. Temporal stratification helps to address this assumption. The smaller the periods are, the less likely this assumption will be violated. The Devereux Creek chinook fry estimate had the greatest number of strata (7) and therefore, was likely the most accurate. Capture efficiency over the seven periods ranged from 7.9 % to 37.9 %. The variability exhibited here demonstrates the importance of stratification. It would have been beneficial to have an additional mark release group during the early stages of the study as the lowest trap efficiency occurred during this prolonged period. The Devereux Creek coho fry and chinook smolt estimates had five and four strata, respectively. For both species, capture efficiencies were generally lower than for chinook fry and on only two occasions exceeded ten percent. Carlson et al. (1998) suggest achieving trap efficiencies of 10 – 20 % for most studies. In order to reach this target, it may be necessary to increase the number of efficiency trials, increase the number of marked releases in each trial and modify trap set up to increase capture efficiency. Carlson et al. (1998) provide a method for estimating the number of fish to mark at a given level of efficiency for two probability levels of exceeding the desired relative error. It is recommended that this method be followed when designing future studies.

At the Klinaklini River site, only three trap efficiency trials were conducted for chinook fry with efficiencies ranging from 0.26 % to 2.03 %. Clearly, additional releases are required at this site for all species and size categories. It may also be worthwhile to experiment with field procedures that increase total trap catch and capture efficiency.

Violating the assumption of within-stratum consistency in capture probability is a potential drawback of the simple stratified design. However, the technique accounts for major changes and trends in capture probability, which in most cases will substantially reduce bias, compared with a non-stratified Petersen estimate. Minimizing stratum length while maintaining discrete periods helps reduce the chances of violating this assumption (Carlson et al. 1998).

Assumption 4 – marks are not lost between release and recovery. This assumption concerns the survival of marked fish and mark retention. In the current study, marked fish were held to monitor short term survival and all mortalities were removed from the population estimate. The bismark brown dye used to mark fish is a well established marking agent that has been utilized in fisheries studies for many years with good success. In the current project, all marked fish were held for a period before release to ensure that good dye retention was achieved and that all marked fish were easily recognizable.

Assumption 5 – all marked fish are reported on recapture. To assure that this assumption was met all field staff were well trained to recognize marks. Also, as mentioned above, marked fish were held to assure adequate dye retention was achieved and that all marked fish were easily recognizable.

Assumption 6 – all marked fish released are either recovered or pass by the downstream capture site. This concerns the problem of fish occurring in subsequent strata and of differential predation on marked fish. A review of the recapture data indicated that strata were discrete; however, it may be appropriate to alternate mark types between adjacent strata in subsequent studies to further test the assumption. Release strategies designed to ensure adequate mixing of marked fish also helped to avoid differential predation. It has been suggested that releasing marked fish at dusk further reduces exposure to predators (ODFW Sampling Manual). This release strategy should be also be explored in future projects.

The estimated number of chinook fry leaving Devereux Creek was greater than the estimated number moving past the Klinaklini trap located downstream of the Devereux Creek confluence. This result indicates that either the Devereux Creek estimate was biased high, the Klinaklini estimate was biased low or that Devereux Creek fry did not migrate past the Klinaklini trap site. Based on the discussion of the assumptions provided above, it seems unlikely that the

Devereux Creek estimate was substantially biased. Also, as there is only a short section of river between the two trap sites, and many of the marked chinook fry released in Devereux Creek were recaptured in the Klinaklini trap it seems most likely that the Klinaklini estimate was biased low. There were only three chinook fry mark release groups for the Klinaklini trap representing periods ranging from 28 to 46 days. The highest trap efficiency was measured during the peak of chinook fry migration. If this high level of efficiency was not representative of the period then the population estimate would be biased low. To address this situation, future projects should attempt to increase the number of marked releases at the Klinaklini trap site.

Most projects of this type require at least one full season of development before final implementation (Carlson et al. 1998). The lessons learned in the current study will greatly benefit all future work.

ACKNOWLEDGEMENTS

We would like to express our appreciation to a number of people who made this study possible. Accommodation and meals were provided by Wahkash Contracting Ltd. and International Forest Products Ltd., whose representatives, Tim Whales, Jim Heppner, Matt Roberts, and Don Neill, provided valuable assistance, access to their fuel supply, the use of their workshop facility and storage shed. Research technicians Ron Zenner and Jenifer Gordon provided invaluable assistance in all aspects of the program. We thank Rob Dusseault, Mike Ballard, Glen Doutre and Alan Eden for their efforts in completing all field aspects of the project. Dave Key, Pisces Research Corps, facilitated design and construction of the rotary screw traps, provided technical assistance, and was involved in the installation and removal of the equipment. We thank Greg Savard, DFO Fish Management; who provided historical escapement information for the Klinaklini system and to Lynne Campo who provided environmental data.

LITERATURE CITED

Argue, A.L., R. Hilborn, R.M. Peterman, M. J. Staley, and C.J. Walters. 1983. Strait of Georgia chinook and coho fishery. Can. Bull. Fish. Aquat. Sci. 211:91p.

Carlson, S.R., L.G. Coggins Jr. and C.O. Swanton. 1998. A simple stratified design for mark-recapture estimation of salmon smolt abundance. Alaska Fish. Res. Bull. 5(2):88-102.

Chapman, D. W. 1966. Food and space as regulators of salmonid populations in streams. Amer. Nat. 100: 345-357.

Collicut, L.D., T.F. Shardlow. 1995. Strait of Georgia Sport Fishery Creel Survey Statistics for Salmon and Groundfish, 1991. Can. Tech. Rep. Fish. Aquatic Sci. 2137:75 p.

Department of Fisheries and Oceans. 1995. Fraser River Chinook Salmon. Prepared by Fraser River Action Plan, Fishery Management Group. Vancouver, B.C. 24 p.

Diewert, R.E., J.C. Sturhahn and D.A. Nagtegaal. 2001. Results of the chinook assessment study conducted on the Klinaklini River during 1999. Can. Manuscr. Rep. Fish. Aquat. Sci. 2580: 46 p.

Diewert, R.E., D.A. Nagtegaal and E.W. Carter. 2002. Results of the chinook assessment study conducted on the Klinaklini River during 2000. Can. Manuscr. Rep. Fish. Aquat. Sci. 2609: 60 p.

Fielden, R. and T. Slaney. 1982. 1981 survey of salmonids spawning in selected streams of Knight Inlet, British Columbia. Prepared for Dept. Fish. and Oceans by Aquatic Resources Ltd. 89 p.

Fielden, R., T. Slaney, and G.J. Birch. 1985. Knight Inlet juvenile salmonid reconnaissance. Prepared for Dept. Fish. and Oceans by Aquatic Resources Ltd. 210 p.

Frith, H.R., T.C. Nelson, and C.J. Schwarz. 1995. Comparison of rotary trap mark-recapture outmigration estimates with fence counts for coho and steelhead smolts in the Keogh River, 1995. Report prepared for the British Columbia Ministry of Environment, Lands, and Parks, Watershed Restoration Program, by LGL Limited, Sidney, BC.

Healey, M.C. 1991. Life history of chinook salmon. *In*: Pacific salmon life histories. Edited by C.Groot and L. Margolis. University of British Columbia Press, Vancouver, B.C. pp 311-394.

Murphy, M.L., K.V. Koski, J.M. Lorenz, and J.F. Thedinga. 1997. Downstream migration of juvenile Pacific salmon (*Oncorhynchus spp.*) in a glacial transboundry river. Can J. Fish. Aquat. Sci. 54: 2837–2846.

ODFW (Oregon Department of Fish and Wildlife) Sampling Manual. Sampling protocols for downstream migrant fish traps. http://www.orst.edu/Dept/ODFW/life-cycle /TRPMETH3.HTM.

PSC (Pacific Salmon Commission). 1987. Joint chinook technical committee 1986 annual report. TCHINOOK (87)-4.

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Bull. Fish. Res. Board Can. 191:382 p.

Rimmer, D.W. and F.N. Axford. 1990. A preliminary evaluation of fish habitat and recreational fisheries values in the mainland coast planning unit. Environment and Lands.

Roper, B. and D. Scarnecchi. 1998. Emigration of age-0 chinook (*Oncorhynchus tshawytscha*) smolts from the upper South Umpqua River basin, Oregon, U.S.A. Can. J. Fish. Aquat. Sci. 56:939-946.

Sandercock, F.K. 1991. Life history of chinook salmon. *In*: Pacific salmon life histories. Edited by C.Groot and L. Margolis. University of British Columbia Press, Vancouver, B.C. pp 395-446.

Seber, G.A.F. 1982. The estimation of animal abundance and related parameters, second edition. Griffin, London.

Sturhahn, J.C. and D.A. Nagtegaal. 1999. Results of the chinook assessment study conducted on the Klinaklini River during 1998. Can. Manuscr. Rep. Fish. Aquat. Sci. 2497: 65 p.

Thedinga, J.F., M.L. Murphy, S.W. Johnson, J.M. Lorenz and K.V. Koski. 1994. Determination of salmonid yield with rotary screw traps in the Situk River, Alaska, to predict effects of glacial flooding. N. Am. J. Fish. Man. 14:837-851.

Waples, R.S. 1991. Genetic interactions between hatchery and wild salmonids: lessons from the Pacific Northwest. Can. J. Fish. Aquat. Sci. 48 (Suppl. 1): 124-133.

Whelen, M.A. and J.D. Morgen. 1984. 1983 spawning salmonid studies in selected watercourses of Knight Inlet, British Columbia. Prepared for Dept. Fish. and Oceans by EVS Consultants Ltd. 172 p.

Table 1. Daily catch of juvenile salmon, by species, in the Devereux Creek RST, 2001.

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
25-Feb	1500	25-Feb	0800	789	0	0	0	14	0	1
26-Feb	2015	26-Feb	0830	1422	1	0	0	84	0	0
27-Feb	2030	27-Feb	0845	1862	0	0	0	169	0	0
27-Feb	0830	27-Feb	2015	120	0	0	0	3	0	0
28-Feb	0845	28-Feb	2100	365	0	2	0	28	1	0
28-Feb	2100	1-Mar	0900	746	0	0	0	24	0	1
1-Mar	1800	2-Mar	0845	1506	0	24	0	245	0	0
2-Mar	0845	2-Mar	2045	83	0	1	0	19	2	0
2-Mar	2045	3-Mar	0810	583	0	0	0	124	3	0
3-Mar	0810	3-Mar	2000	184	0	3	0	33	3	0
3-Mar	2000	4-Mar	0830	408	0	6	0	149	1021	0
4-Mar	0830	4-Mar	0745	43	0	1	0	8	7	0
4-Mar	1945	5-Mar	0810	350	0	5	0	73	40	2
5-Mar	0810	5-Mar	1930	44	0	0	0	8	3	0
5-Mar	1930	6-Mar	0745	124	0	0	0	44	17	0
6-Mar	0745	6-Mar	1935	32	0	1	0	9	2	0
6-Mar	1935	7-Mar	0750	180	0	0	0	62	42	0
7-Mar	0705	7-Mar	1830	23	0	0	0	7	2	0
7-Mar	1830	8-Mar	0810	37	0	1	0	36	6	0
8-Mar	0810	8-Mar	1930	45	0	1	0	38	5	0
8-Mar	1900	9-Mar	1500	163	0	2	2	20	15	0
9-Mar	0700	9-Mar	1915	52	0	0	0	12	11	0
9-Mar	1930	10-Mar	1000	195	0	2	2	8	13	1
10-Mar	0730	10-Mar	1930	80	0	0	0	25	13	0
10-Mar	1930	11-Mar	0730	2470	0	1	2	55	210	0
11-Mar	0730	11-Mar	1930	82	0	0	0	14	55	0
11-Mar	1930	12-Mar	0730	9252	0	372	0	54	356	0
12-Mar	0730	13-Mar	0730	8680	0	1176	1	769	327	1
13-Mar	0700	14-Mar	0830	5048	0	1068	0	356	540	0
14-Mar	0800	15-Mar	0830	7200	1	768	0	280	104	0
15-Mar	0800	16-Mar	0800	4583	0	505	1	45	75	0
16-Mar	0800	17-Mar	0800	5605	0	837	1	677	333	0
17-Mar	0800	18-Mar	0800	9428	0	1820	1	1148	660	0
18-Mar	830	20-Mar	0830	877	0	35	0	41	68	0
19-Mar										
20-Mar	0830	21-Mar	0830	2152	0	268		232	150	0
21-Mar	0830	22-Mar	0830	4795	0	390	1	280	162	0
22-Mar	0745	23-Mar	0745	3493	0	26	5	298	158	13
23-Mar	0830	24-Mar	0930	4660	0	20	5	68	99	6
24-Mar	0930	25-Mar	0931	4255	2	97	9	237	425	39
25-Mar	0931	26-Mar	0858	4392	0	311	3	3486	282	62
26-Mar	0858	27-Mar	0823	7528	0	217		7484	366	78
27-Mar	0823	28-Mar	0832	7741	0	280	4	3248	394	6
28-Mar	0832	29-Mar	0901	7226	0	241	3	5447	482	56
29-Mar	0901	30-Mar	0848	4083	0	108	2	3219	589	32

Table 1. (cont.)

Set Date	Set Time	Sample Date	Sample Time	Chinook		Coho		Pink	Chum	Sockeye
				Fry	Smolt	Fry	Smolt			
30-Mar	0848	31-Mar	0825	4250	0	100	1	3130	521	28
31-Mar	0825	1-Apr	0845	6920	0	169	3	5284	632	39
1-Apr	0845	2-Apr	0841	4944	0	103	2	2197	353	8
2-Apr	0841	3-Apr	0840	2929	1	29	3	2238	382	8
3-Apr	0840	4-Apr	0835	1840	0	42	9	2867	212	21
4-Apr	0835	5-Apr	0838	1501	2	97	2	3544	258	20
5-Apr	0830	6-Apr	0900	1096	0	150	2	976	206	272
6-Apr	0900	7-Apr	0900	904	1	254	3	1459	345	296
7-Apr	0900	8-Apr	0830	992	1	180		1440	324	0
8-Apr	0900	9-Apr	0845	1504	1	252	5	1280	432	4
9-Apr	0910	10-Apr	0845	8226	3	2398	0	2121	1366	0
10-Apr	0930	11-Apr	0830	11353	3	3600	0	780	1140	0
11-Apr	0830	12-Apr	0805	5497	0	2150	7	641	585	0
12-Apr	900	13-Apr	1100	6615	0	2589	2	566	418	0
13-Apr	1145	14-Apr	0820	4115	3	1935	3	203	127	0
14-Apr	855	15-Apr	815	5880	8	2304	5	416	272	0
15-Apr	0855	16-Apr	800	5948	1	2089	1	177	204	0
16-Apr	0845	17-Apr	0815	5841	3	2145	4	78	105	0
17-Apr	0850	18-Apr	0820	3900	9	2340	1	176	296	0
18-Apr	850	19-Apr	0813	3564	13	1980	1	40	200	0
19-Apr	0900	20-Apr	0840	2596	16	2028	1	231	392	21
20-Apr	0840	21-Apr	0915	2580	19	1729	3	44	357	37
21-Apr	0915	22-Apr	0920	3916	38	3333	5	41	667	47
22-Apr	0920	23-Apr	0915	2593	41	3199	8	2	587	18
23-Apr	0915	24-Apr	0915	4161	49	7990	6	12	1214	89
24-Apr	0918	25-Apr	0845		96		18			
25-Apr		26-Apr								
26-Apr		27-Apr								
27-Apr	1140	28-Apr	0850	749	154	567	46	7	94	3
28-Apr	0850	29-Apr	0800	583	178	862	21	0	51	12
29-Apr	0800	30-Apr	0850	562	188	685	32	1	18	0
30-Apr	0850	1-May	0745	455	126	545	41	0	22	2
1-May	0645	2-May	0803	259	172	238	39	0	4	1
2-May	0803	3-May	0830	122	63	96	22	3	12	1
3-May	0830	4-May	0830	85	145	50	21	0	13	1
4-May	0700	5-May	0800	62	240	39	48	0	8	1
5-May	0800	6-May	1030	28	98	11	4	0	8	0
6-May	1100	7-May	1130	40	114	13	3	0	1	0
7-May	1230	8-May	1100	95	145	54	0	0	15	0
8-May	1200	9-May	1200	209	110	290	0	2	18	0
9-May	1300	10-May	1130	281	85	1770	0	3	25	0
10-May	1230	11-May	1200	353	154	4262	0	5	34	1
11-May	1300	12-May	1700	236	122	2894	3	0	54	0
12-May	1800	13-May	1600	256	230	2372	0	5	40	0
13-May	1700	14-May	1200	162	153	2803	1	5	11	0
14-May	1300	15-May	1200	143	304	1378	1	2	31	0

Table 1 (cont.)

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
15-May	1300	16-May	1130	119	158	807	0	0	1	0
16-May	0730	17-May	0800	145	172	815	0	0	16	0
17-May	0700	18-May	0700	109	112	566	6	0	1	0
18-May	0745	19-May	0900	243	249	1045	9	0	2	0
19-May	0930	20-May	0930	98	162	423	7	0	3	0
20-May	1000	21-May	1000	90	124	597	4	0	0	0
21-May	1000	22-May	1000	139	103	538	1	0	1	0
22-May	1000	23-May	1000	114	84	510	6	0	1	0
23-May	1000	24-May	1000	152	73	650	10	0	1	0
24-May	1000	25-May	1000	124	73	440	10	0	0	0
25-May	1000	26-May	1000	121	18	540	1	0	1	0
26-May	1000	27-May	1000	94	42	873	7	0	0	0
27-May	1000	28-May	1000	122	22	419	5	0	0	0
28-May	1000	29-May	1000	109	17	191	2	0	0	0
29-May	1000	30-May	1000	33	40	52	3	0	0	0
30-May	1000	31-May	1000	39	36	35	1	0	0	0
31-May	1000	1-Jun	0830	280	71	249	20	0	1	0
1-Jun	1300	2-Jun	0800	35	38	13	5	0	1	0
2-Jun	0710	3-Jun	0800	36	71	30	5	0	0	0
3-Jun	0700	4-Jun	1030	18	66	14	6	0	0	0
4-Jun	0850	5-Jun	1030	16	24	14	5	0	0	0
5-Jun	1030	6-Jun	1130	19	17	7	2	0	0	0
6-Jun	1130	7-Jun	1130	11	17	12	2	0	0	0
7-Jun	1130	8-Jun	0945	35	11	11	1	0	0	0
8-Jun	0945	9-Jun	1045	98	55	64	3	0	0	0
9-Jun	1045	10-Jun	0945	87	50	58	6	0	0	0
10-Jun	0945	11-Jun	0845	54	32	61	0	0	0	0
11-Jun	0845	12-Jun	0845	31	19	48	0	0	0	0
12-Jun	0845	13-Jun	0930	27	20	45	1	0	0	0
13-Jun	0930	14-Jun	1335	47	11	58	0	0	0	0
Total				223976	5080	79888	547	58656	19124	1228

Table 2. Daily catch of non-salmon species in the Devereux Creek RST, 2001.

Date	Species														
	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	UNK	RBS	RSD
25-Feb	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Feb	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Feb	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Feb	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Feb	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0
1-Mar	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Mar	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3-Mar	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Mar	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Mar	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Mar	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Mar	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Mar	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Mar	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
11-Mar	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Mar	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Mar	11	9	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Mar	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Mar	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Mar	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Mar	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Mar	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0
21-Mar	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0
22-Mar	3	4	0	1	0	0	0	0	0	0	0	0	0	0	0
23-Mar	4	12	0	0	4	0	0	0	0	0	0	0	0	0	0
24-Mar	13	4	1	0	0	0	0	0	0	0	0	0	0	0	0
25-Mar	7	4	0	0	14	0	0	0	0	0	0	0	0	0	0
26-Mar	1	7	0	0	160	1	0	0	0	0	0	0	0	0	0
27-Mar	5	23	0	0	441	0	0	0	0	0	0	0	0	0	0
28-Mar	5	13	0	0	521	0	0	0	0	0	0	0	0	0	0
29-Mar	12	9	0	0	431	0	0	0	0	0	0	0	0	0	0
30-Mar	8	22	3	0	338	0	0	0	0	0	0	0	0	0	0
31-Mar	9	17	2	0	322	0	0	0	0	0	0	0	0	0	0

Table 2. (cont.)

Date	Species														
	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	UNK	RBS	RSD
1-Apr	14	10	2	0	579	0	0	0	0	0	0	0	0	0	0
2-Apr	6	15	0	0	551	0	0	0	0	0	0	0	0	0	0
3-Apr	11	4	0	0	321	0	0	0	0	0	0	0	0	0	0
4-Apr	11	5	0	0	243	0	0	0	0	0	0	0	0	0	0
5-Apr	5	8	0	0	435	0	0	0	0	0	0	0	0	0	0
6-Apr	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Apr	4	4	3	0	0	0	0	0	0	0	0	0	1	0	0
8-Apr	5	5	0	1	244	0	0	0	0	0	0	0	0	0	0
9-Apr	3	7	3	0	412	0	0	0	0	0	0	0	0	0	0
10-Apr	3	4	1	0	1154	0	0	0	0	0	0	0	0	0	0
11-Apr	1	31	5	0	738	0	0	0	0	0	0	0	0	1	0
12-Apr	11	27	7	0	1770	0	0	0	0	0	0	0	0	0	0
13-Apr	2	21	8	0	1123	0	0	0	0	0	0	0	0	0	0
14-Apr	2	19	5	0	390	0	0	0	0	0	0	0	0	0	0
15-Apr	5	6	3	0	848	1	2	0	0	0	0	0	0	0	0
16-Apr	4	35	4	0	1108	0	0	0	0	0	0	0	0	1	0
17-Apr	8	24	12	0	642	0	0	0	0	0	0	0	0	0	0
18-Apr	8	17	20	0	1016	1	0	0	0	0	0	0	0	0	0
19-Apr	7	20	8	0	732	0	0	0	0	0	0	0	0	1	1
20-Apr	15	78	13	1	760	2	0	0	0	0	0	0	0	1	0
21-Apr	51	98	54	0	561	0	0	0	0	0	1	0	0	2	0
22-Apr	24	89	52	1	1101	1	0	0	0	0	0	0	0	1	0
23-Apr	11	39	44	2	717	4	0	0	0	0	0	0	0	4	0
24-Apr	12	56	26	0	761	1	0	0	0	0	0	0	0	0	0
25-Apr															
26-Apr															
27-Apr															
28-Apr	11	84	12	0	60		0	0	0	0	0	0	0	0	0
29-Apr	1	5	5	0	12	4	0	0	0	0	0	0	0	0	0
30-Apr	9	32	16	0	4	5	0	0	1	0	0	0	0	0	0
1-May	23	63	8	0	2	6	0	0	0	0	0	0	0		0
2-May	31	73	23	1	5	2	0	0	0	0	0	0	0	2	0
3-May	18	63	6	0	3	1	0	0	0	0	0	0	0	0	0
4-May	31	49	12	1	2	12	0	0	0	0	0	0	0	0	0
5-May	21	47	27	1	2	7	0	0	0	0	0	0	0	0	0
6-May	16	64	17	0	0	7	0	0	0	0	0	0	1	0	0
7-May	11	42	17	1	0	4	0	0	0	0	0	0	0	0	0
8-May	16	110	22	3	3	3	0	0	0	0	0	0	0	0	0
9-May	23	166	22	1	4	10	0	0	0	0	0	0	0	0	0
10-May	17	126	9	2	5	9	0	0	0	0	0	0	0	0	0
11-May	32	230	19	3	9	10	0	0	0	0	0	0	0	0	0
12-May	16	183	14	1	6	5	0	0	0	0	0	0	0	0	0
13-May	22	276	18	4	5	9	0	0	0	0	0	0	0	0	0
14-May	31	326	12	2	13	11	0	0	0	0	0	2	0	0	0
15-May	24	360	14	1	15	16	0	0	0	0	0	1	0	0	0
16-May	18	273	10	1	7	21	0	0	0	0	0	0	0	0	0

Table 2. (cont.)

Date	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	UNK	RBS	RSD
	Species														
17-May	27	377	13	1	22	19	1	0	0	0	0	0	0	0	0
18-May	26	428	12	1	21	19	0	0	0	0	0	0	0	0	0
19-May	28	428	10	3	1	25	0	0	0	0	0	0	0	22	0
20-May	25	583	18	2	27	12	0	0	0	0	0	0	2	0	0
21-May	25	540	9	2	20	14	0	0	0	0	0	0	0	0	0
22-May	5	32	13	1	8	19	0	0	0	0	0	0	0	0	0
23-May	3	275	16	0	12	12	0	0	0	0	0	1	0	0	0
24-May	26	1000	21	0	4	11	0	0	0	0	0	1	0	0	0
25-May		1000	4	0	0	10	0	0	0	0	0	0	0	0	0
26-May	5	700	1	0	0	3	0	0	0	0	0	0	0	0	0
27-May	12	1000	4	0	2	6	0	0	0	0	0	0	0	0	0
28-May	24	650	4	0	0	0	0	0	0	0	0	0	0	0	0
29-May	36	600	10	0	0	3	0	0	0	0	0	0	0	0	0
30-May	30	350	16	1	2	6	0	0	0	0	0	0	0	0	0
31-May	25	225	14	0	3	8	0	0	0	0	0	0	0	0	0
1-Jun	85	313	60	0	0	4	0	0	0	0	0	0	0	1	0
2-Jun	58	284	39	0	0	2	0	0	0	0	0	0	0	0	0
3-Jun	54	246	48	0	0	6	0	0	0	0	0	0	0	1	0
4-Jun	81	186	56	0	0	5	0	0	0	0	0	0	0	3	0
5-Jun	141	263	44	0	0	2	0	0	0	0	0	0	0	2	0
6-Jun	35	102	17	1	0	3	0	0	0	0	0	0	0	0	1
7-Jun	30	184	34	1	0	7	0	0	0	0	0	0	0	0	0
8-Jun	77	104	17	0	0	5	1	0	0	0	0	0	0	0	0
9-Jun	90	172	32	1	0	8	0	0	0	0	0	0	0	0	0
10-Jun	158	121	41	0	0	8	0	0	0	0	0	0	0	0	1
11-Jun	160	53	59	0	0	12	0	0	0	0	0	0	0	1	0
12-Jun	169	40	28	0	0	4	0	0	0	0	0	0	0	0	0
13-Jun	447	77	50	0	0	6	0	0	0	0	0	0	0	0	1
14-Jun	243	93	64	0	0	2	0	0	0	0	0	0	0	0	0
Total	2890	13805	1317	44	18716	394	4	0	1	0	1	5	4	43	4

Sc = Sculpin, LR = Lamprey, Stk = Stickleback, DV = Dolly Varden char, Cut = Cutthroat trout
Mwf = Mountain Whitefish, Eul = Eulachon, PMC = Peamouth Chub, NPM = Northern Pike Minnow
Bull = Bull Trout, LNS = Long Nose Sucker, UKN = unknown, RBS = Rainbow Trout smolts
RDS = Redside Shiner

Table 3. Daily catch of juvenile salmon, by species, in the Klinaklini River RST, 2001.

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
23-Feb	1530	25-Feb	0930	32	2	0	0	0	0	0
28-Feb	1200	28-Feb	2045	30	0	0	0	0	0	0
28-Feb	2045	1-Mar	0715	62	0	0	0	0	0	0
1-Mar	1930	2-Mar	0715	66	0	0	0	2	3	0
2-Mar	0745	2-Mar	1945	26	0	0	1	2	0	0
2-Mar	1945	3-Mar	0702	133	0	6	3	12	2	0
3-Mar	0702	3-Mar	1845	20	0	0	0	0	0	0
3-Mar	2000	4-Mar	0830	91	0	6	7	12	18	0
4-Mar	0711	4-Mar	0650	28	0	1	0	0	0	0
4-Mar	1850	5-Mar	0705	73	0	2	8	7	9	0
5-Mar	0705	5-Mar	1850	11	0	0	0	0	3	0
5-Mar	1850	6-Mar	0658	62	0	0	6	10	11	0
6-Mar	0658	6-Mar	1845	10	0	0	1	0	4	0
6-Mar	1845	7-Mar	0705	29	0	0	9	8	14	0
7-Mar	0705	7-Mar	1920	6	0	0	1	1	0	0
7-Mar	1920	8-Mar	0716	22	0	0	6	8	6	0
8-Mar	0716	8-Mar	2000	6	0	0	0	1	1	0
8-Mar	2000	9-Mar	1145	32	0	0	12	0	0	0
9-Mar	0700	9-Mar	1900	1	0	0	0	0	0	0
9-Mar	1930	10-Mar	0900	21	0	0	6	1	3	0
10-Mar	0700	10-Mar	1930	3	0	0	1	1	2	0
10-Mar	1930	11-Mar	0700	222	1	1	13	0	24	1
11-Mar	0730	11-Mar	1930	10	0	0	0	0	3	0
11-Mar	1900	12-Mar	0700	620	0	5	6	2	74	0
12-Mar	0700	13-Mar	0700	880	0	22	6	1	30	0
13-Mar	0700	14-Mar	0700	469	1	61	13	0	18	0
14-Mar	0700	15-Mar	0700	584	0	10	9	1	9	0
15-Mar	0700	16-Mar	0700	527	3	21	7	1	13	0
16-Mar	0700	17-Mar	0700	329	1	14	6	0	2	0
17-Mar	0700	18-Mar	0700	408	1	21	3	1	8	0
18-Mar	0700	19-Mar	0700	399	0	17	16	2	8	0
19-Mar	0730	20-Mar	0730	289	0	4	8	1	4	0
20-Mar	0730	21-Mar	0730	293	0	4	9	0	12	0
21-Mar	0730	22-Mar	0730	247	1	7	6	3	18	0
22-Mar	0700	23-Mar	0700	317	0	2	4	4	10	0
23-Mar	0830	24-Mar	0930	92	0	15	0	62	47	0
24-Mar	0755	25-Mar	0730	595	0	5	1	3	12	1
25-Mar	0730	26-Mar	0731	541	0	18	4	62	35	0
26-Mar	0731	27-Mar	0700	740	0	52	4	52	65	7
27-Mar	0700	28-Mar	0715	492	0	11	5	24	49	0
28-Mar	0715	29-Mar	0730	746	0	20	6	17	39	3
29-Mar	0730	30-Mar	0718	558	0	10	3	23	35	7
30-Mar	0718	31-Mar	0715	522	0	12	4	26	20	1
31-Mar	0715	1-Apr	0714	723	0	12	4	42	41	2

Table 3. (cont.)

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
1-Apr	0714	2-Apr	0725	592	0	6	0	25	39	0
2-Apr	0725	3-Apr	0718	451	2	12	6	12	22	1
3-Apr	0718	4-Apr	0731	145	1	5	6	11	7	0
4-Apr	0731	5-Apr	0718	201	0	7	2	16	10	2
5-Apr	0730	6-Apr	0800	129	0	5	0	13	11	0
6-Apr	0800	7-Apr	0730	159	0	9	0	6	6	0
7-Apr	0730	8-Apr	0722	217	0	21	1	18	10	0
8-Apr	0737	9-Apr	0730	176	0	47	1	11	14	0
9-Apr	0800	10-Apr	0730	1000	1	198	0	29	58	0
10-Apr	0800	11-Apr	0700	911	2	347	1	28	20	0
11-Apr	0730	12-Apr	0650	937	1	238	0	10	19	0
12-Apr	0711	13-Apr	0702	990	3	326	2	40	27	0
13-Apr	0726	14-Apr	0700	629	2	98	1	14	6	0
14-Apr	0720	15-Apr	0700	743	3	129	4	28	19	0
15-Apr	0720	16-Apr	0645	715	2	168	2	13	4	0
16-Apr	0705	17-Apr	0700	588	2	168	0	3	1	0
17-Apr	0720	18-Apr	0650	223	2	72	2	1	3	0
18-Apr	0710	19-Apr	0650	457	4	101	3	2	7	0
19-Apr	0710	20-Apr	0700	259	1	30	1	0	3	0
20-Apr	0700	21-Apr	0730	180	10	15	0	0	22	0
21-Apr	0730	22-Apr	0720	161	33	14	0	0	17	0
22-Apr	0720	23-Apr	0655	243	22	13	0	1	25	0
23-Apr	0655	24-Apr	0655	192	18	31	1	0	52	1
24-Apr		25-Apr								
25-Apr		26-Apr								
26-Apr		27-Apr								
27-Apr	0800	28-Apr	0715	17	28	12	16	0	21	0
28-Apr	0715	29-Apr	0645	95	104	594	20	3	149	0
29-Apr	0645	30-Apr	0655	42	123	344	10	4	65	0
30-Apr	0655	1-May	0645	48	100	144	21	0	29	0
1-May	0745	2-May	0655	28	157	62	30	2	23	0
2-May	0655	3-May	0645	18	110	11	15	0	11	0
3-May	0640	4-May	0645	7	78	8	10	0	4	0
4-May	0645	5-May	0700	29	154	20	2	0	28	0
5-May	0800	6-May	0700	8	194	9	4	2	32	1
6-May	0730	7-May	0900	13	102	9	3	1	9	0
7-May	1000	8-May	0930	17	132	10	2	4	8	0
8-May	1030	9-May	0630	38	164	18	0	2	19	0
9-May	0730	10-May	0630	46	169	85	1	1	29	0
10-May	0730	11-May	0630	44	156	390	1	8	53	0
11-May	0730	12-May	0630	35	304	225	1	0	80	0
12-May	0800	13-May	0700	60	446	254	2	0	215	0
13-May	0800	14-May	0630	28	205	334	1	1	83	0
14-May	0730	15-May	0630	14	267	227	2	0	109	0
15-May		16-May								

Table 3. (cont.)

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
16-May	1230	17-May	0615	7	131	162	1	1	29	0
17-May	0700	18-May	0700	14	116	69	1	0	30	0
18-May	0700	19-May	0650	28	106	81	1	0	77	1
19-May	0700	20-May	0700	20	175	46	8	0	34	0
20-May	0700	21-May	0700	13	109	61	6	0	43	0
21-May	0700	22-May	0700	44	281	28	3	0	43	0
22-May	0700	23-May								
23-May	0700	24-May	0700	36	13	175	13	0	8	0
24-May		25-May								
25-May	0700	26-May	0700	12	19	25	7	0	7	0
26-May	0700	27-May	0700	4	26	5	13	0	8	1
27-May	0700	28-May	0700	3	6	6	6	0	0	0
28-May	0700	29-May	0700	7	91	7	7	0	15	1
29-May	0700	30-May	0700	13	32	13	5	0	14	0
30-May	0700	31-May	0700	8	12	8	3	0	4	0
31-May	0700	1-Jun	0830							
1-Jun		2-Jun								
2-Jun		3-Jun								
3-Jun		4-Jun								
4-Jun	0900	5-Jun	0700	16	14	29	5	0	2	0
5-Jun	0700	6-Jun	0730	1	18	16	1	0	2	0
6-Jun	0730	7-Jun	0700	9	18	35	2	0	0	0
7-Jun	0700	8-Jun	0645	16	18	28	1	0	0	0
8-Jun	0700	9-Jun	0700	23	20	66	1	0	0	0
9-Jun	0900	10-Jun	0645	12	16	43	1	0	0	0
10-Jun	0645	11-Jun	0700	12	11	38	0	0	0	0
11-Jun	0700	12-Jun	0645	11	8	14	0	0	0	0
12-Jun	0645	13-Jun	0700	8	4	30	1	0	0	0
13-Jun	0700	14-Jun	0645	7	5	23	0	0	1	0
Total				22576	4361	6183	458	702	2338	30

Table 4. Daily catch of non-salmon species in the Klinaklini River RST, 2001.

Date	Species													
	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	RBS	UNK
25-Feb	0	2	0	0	0	0	0	0	0	0	0	0	0	0
28-Feb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Mar	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Mar	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar	0	2	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Mar	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Mar	1	0	1	0	0	0	0	0	0	0	0	0	0	0
6-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Mar	4	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Mar	4	1	0	0	0	0	0	0	0	0	0	0	0	0
9-Mar	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Mar	1	2	0	0	0	0	0	0	0	0	0	0	0	0
10-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Mar	3	1	0	0	0	0	0	0	0	0	0	0	0	0
11-Mar	2	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Mar	0	2	0	0	0	0	0	0	0	0	0	0	0	0
13-Mar	4	2	0	0	0	0	0	0	0	0	0	0	0	0
14-Mar	8	5	0	0	0	0	0	0	0	0	0	0	0	0
15-Mar	1	3	0	0	0	0	0	0	0	0	0	0	0	0
16-Mar	2	4	0	0	0	0	0	1	0	0	0	0	0	0
17-Mar	0	0	0	0	0	0	0	1	0	0	0	0	0	0
18-Mar	2	5	0	0	1	0	0	0	0	0	0	0	0	0
19-Mar	3	4	1	0	0	0	0	0	0	0	0	0	0	0
20-Mar	2	4	0	0	0	0	0	0	0	0	0	0	0	0
21-Mar	1	3	0	0	0	2	0	1	0	0	0	0	0	0
22-Mar	2	2	0	0	0	0	0	1	1	0	0	0	0	0
23-Mar	1	1	0	0	0	1	0	1	0	0	0	0	0	0
24-Mar	1	6	1	0	0	0	0		0	0	0	0	0	0
25-Mar	8	2	0	0	1	0	0	1	0	0	0	0	0	0
26-Mar	2	1	1	0	3	0	0	1	0	0	0	0	0	0
27-Mar	2	4	1	0	11	0	0	2	0	0	0	0	0	0
28-Mar	3	3	0	0	4	0	0	9	0	0	0	0	0	0
29-Mar	6	0	0	0	4	0	0	0	0	0	0	0	0	0
30-Mar	1	2	2	0	0	0	0	0	0	0	0	0	0	0
31-Mar	4	0	0	0	11	0	0	4	0	0	0	0	0	0
1-Apr	4	1	0	0	5	0	0	4	0	0	0	0	0	0
2-Apr	3	1	0	0	3	0	0	3	0	0	0	0	0	0

Table 4. (cont.)

Date	Species													
	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	RBS	UNK
3-Apr	1	0	0	0	0	0	0	3	0	0	0	0	0	0
4-Apr	0	1	1	1	2	0	0	0	0	0	0	0	0	0
5-Apr	5	1	0	0	7	0	0	0	1	0	0	0	0	0
6-Apr	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7-Apr	0	1	0	0	0	0	0	1	0	0	0	0	0	0
8-Apr	1	2	1	0	1	0	0	3	0	0	0	0	0	0
9-Apr	0	0	0	0	0	0	0	4	0	0	0	0	0	0
10-Apr	0	2	6	0	5	0	0	6	0	0	0	0	0	0
11-Apr	1	3	3	0	0	0	0	47	0	0	0	0	0	0
12-Apr	0	1	3	0	1	1	0	17	0	0	0	0	0	0
13-Apr	0	1	1	0	2	0	0	56	0	0	0	0	0	0
14-Apr	2	2	5	0	1	0	0	118	0	0	0	0	0	0
15-Apr	2	3	0	0	3	0	0	47	0	0	0	0	0	0
16-Apr	6	3	3	0	4	0	0	29	0	0	0	0	0	0
17-Apr	0	0	0	1	0	0	0	27	0	0	0	0	0	0
18-Apr	2	2	0	0	0	0	0	25	0	0	0	0	0	0
19-Apr	3	2	0	0	1	0	0	16	0	0	0	0	0	0
20-Apr	0	1	1	0	0	1	0	6	0	0	0	0	0	0
21-Apr	2	2	4	0	4	0	0	13	0	0	0	0	0	0
22-Apr	1	2	13	0	2	0	0	66	0	0	0	0	0	0
23-Apr	5	0	7	0	3	0	0	33	0	0	0	0	0	0
24-Apr	12	0	4	0	0	0	0	33	0	0	0	0	0	0
25-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Apr	4	3	16	0	1	0	0	0	0	0	0	0	0	0
29-Apr	9	12	32	1	9	8	0	9	1	0	0	0	8	1
30-Apr	5	10	16	0	2	10	0	7	0	0	0	0	0	0
1-May	9	9	24	1	0	7	0	5	0	0	0	0	1	0
2-May	2	13	16	1	2	9	0	2	0	0	0	0	2	0
3-May	2	9	25	0	0	9	0	2	0	0	0	0	0	0
4-May	3	8	15	1	0	7	0	0	0	0	0	0	1	0
5-May	25	57	29	1	0	9	0	2	0	0	0	0	2	0
6-May	2	9	34	0	0	9	0	5	0	0	0	0	0	1
7-May	2	4	22	0	4	10	0		0	0	0	0	0	0
8-May	1	1	15	0	1	2	0	1	0	0	0	0	0	0
9-May	3	11	30	1	3	15	0	2	0	0	0	0	0	0
10-May	2	8	10	1	4	6	0	9	0	0	0	0	0	0
11-May	5	15	19	0	3	9	0	2	0	0	0	0	0	0
12-May	6	8	16	0	10	8	1	5	0	0	0	0	0	0
13-May	5	24	25	2	17	8	0	2	0	0	0	0	0	0
14-May	2	28	15	2	11	18	0	4	0	0	0	0	0	0
15-May	0	28	10	1	19	30	0	3	0	0	0	0	0	0
16-May	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-May	2	18	9	0	10	17	0	2	0	0	0	0	0	0
18-May	4	56	13	3	30	13	0	0	0	0	0	0	0	0

Table 4.(cont.)

	Species													
Date	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	RBS	UNK
19-May	7	33	7	1	1	3	0	0	0	0	0	0	8	0
20-May	9	25	11	0	36	8	0	0	0	0	0	0	0	2
21-May	3	35	9	0	13	26	0	0	0	0	0	0	0	3
22-May	6	37	40	1	29	8	0	0	0	0	0	0	0	0
23-May														
24-May	7	35	18	0	0	0	0	0	0	0	0	0	0	0
25-May	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-May	4	6	16	0	0	0	0	0	0	0	0	1	0	0
27-May	11	49	21	0	0	2	0	0	0	0	0	0	0	1
28-May	2	10	2	0	0	0	0	0	0	0	0	0	0	0
29-May	11	26	36	0	2	7	0	0	0	0	0	0	0	1
30-May	11	29	15	1	0	16	0	0	0	0	0	0	0	0
31-May	3	10	2	0	0	1	0	0	0	0	0	0	0	0
1-Jun														
2-Jun														
3-Jun														
4-Jun														
5-Jun	15	31	42	0	0	2	0	0	0	0	0	0	0	0
6-Jun	6	29	25	0	0	9	0	2	0	0	0		2	0
7-Jun	8	14	36	0	0	2	0	1	0	0	0	1	0	0
8-Jun	5	23	36	0	0	8	0	3	0	0	0	0	0	0
9-Jun	3	9	34	0	0	2	0	1	0	0	0	0	0	0
10-Jun	4	15	27	0	0	1	0	0	0	0	0	0	0	0
11-Jun	4	10	23	0	0	1	1	0	0	0	0	0	0	0
12-Jun	6	12	14	2	0	3	0	0	0	0	0	0	0	0
13-Jun	9	12	17	0	0	1	0	0	0	0	0	0	0	0
14-Jun	3	3	23	0	0	3	1	0	0	0	0	0	0	0
Total	355	878	905	22	287	312	3	648	3	0	0	2	24	9

Sc = Sculpin, LR = Lamprey, Stk = Stickleback, DV = Dolly Varden char, Cut = Cutthroat trout
Mwf = Mountain Whitefish, Eul = Eulachon, PMC = Peamouth Chub, NPM = Northern Pike Minnow
Bull = Bull Trout, LNS = Long Nose Sucker, UKN = unknown, RBS = Rainbow Trout smolts
RDS = Redside Shiner

Table 5. Daily catch of juvenile salmon, by species, in the Dice Creek fence trap, 2001.

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
28-Feb	1530	1-Mar	2000	3	0	0	0	0	0	0
1-Mar	2000	2-Mar	0800	16	0	0	0	0	0	0
2-Mar	2020	2-Mar	0731	1	0	6	0	0	0	0
2-Mar	0800	3-Mar	2000	0	0	1	1	0	0	0
3-Mar	0731	3-Mar	1915	0	0	0	0	0	0	0
3-Mar	1915	4-Mar	0800	0	0	0	0	0	0	0
4-Mar	0800	4-Mar	1920	0	0	0	0	0	0	0
4-Mar	1920	5-Mar	0748	0	1	0	0	0	0	0
5-Mar	0748	5-Mar	1915	0	0	0	0	0	0	0
5-Mar	1915	6-Mar	0728	0	0	0	0	0	0	0
6-Mar	0728	6-Mar	1915	0	0	0	0	0	0	0
6-Mar	1915	7-Mar	0720	0	0	0	0	0	0	0
7-Mar	0715	7-Mar	1850	0	0	0	0	0	0	0
7-Mar	1850	8-Mar	0800	0	0	0	0	1	0	0
8-Mar	0800	8-Mar	2000	0	0	0	0	0	0	0
8-Mar	2000	9-Mar	0800	0	0	0	0	2	0	0
9-Mar	0700	9-Mar	1915	1	0	0	0	1	0	0
9-Mar	1930	10-Mar	1000	0	0	0	1	0	0	0
10-Mar	1930	11-Mar	0730	2	0	1	2	0	4	0
11-Mar	0730	11-Mar	1930	2	0	0	0	0	2	0
11-Mar	1930	12-Mar	0730	31	0	44	5	1	43	0
12-Mar	0730	13-Mar	0730	190	0	1382	3	52	15	0
13-Mar	0730	14-Mar	0800	31	20	0	0	1	41	0
14-Mar	0730	15-Mar	0730	18	2	22	4	14	27	0
15-Mar	0730	16-Mar	0730	17	0	11	0	2	14	0
16-Mar	0730	17-Mar	0730	19	0	19	0	8	16	0
17-Mar	0730	18-Mar	0730	38	3	11	22	3	50	0
18-Mar		19-Mar								0
19-Mar	0800	20-Mar	0800	27	10	1	23	0	23	0
20-Mar	0730	21-Mar	0730	35	8	10	16	1	75	0
21-Mar	0800	22-Mar	0800	40	0	6	2	9	28	0
22-Mar	0730	23-Mar	0730	83	0	21	13	48	103	0
23-Mar	0730	24-Mar	0855	335	1	2	5	2	16	0
24-Mar	0855	25-Mar	0819	51	1	38	25	34	143	0
25-Mar	0819	26-Mar	0815	99	0	27	6	580	619	0
26-Mar	0815	27-Mar	0732	9	0	1	5	32	93	0
27-Mar	0732	28-Mar	0750	46	0	10	4	82	205	0
28-Mar	0750	29-Mar	0805	25	0	18	6	16	48	0
29-Mar	0805	30-Mar	0743	31	0	108	0	23	589	0
30-Mar	0748	31-Mar	0743	15	1	31	0	97	32	0
31-Mar	0743	1-Apr	0744	22	0	52	23	39	49	0
1-Apr	0744	2-Apr	0755	39	0	44	3	236	48	0
2-Apr	0755	3-Apr	0749	32	1	16	2	347	36	0
3-Apr	0749	4-Apr	0800	30	0	24	4	507	73	0
4-Apr	0800	5-Apr	0745	67	0	20	3	687	51	0

Table 5. (cont.)

Set Date	Set Time	Sample Date	Sample Time	Chinook Fry	Chinook Smolt	Coho Fry	Coho Smolt	Pink	Chum	Sockeye
5-Apr	0800	6-Apr	0830	38	1	355	13	335	10	0
6-Apr	0830	7-Apr	0830	6	0	4	0	308	3	0
7-Apr	0830	8-Apr	0758	37	0	13	0	1553	69	0
8-Apr	0832	9-Apr	0815	80	2	66	0	1239	189	0
9-Apr	0830	10-Apr	0815	420	1	678	1	2259	372	0
10-Apr	0830	11-Apr	0750	432	5	1324	1	1848	640	0
11-Apr	0750	12-Apr	0726	211	3	503	1	855	179	0
12-Apr	0735	13-Apr	0745	660	13	1208	14	1520	564	0
13-Apr	0745	14-Apr	0740	221	4	733	3	1201	166	0
14-Apr	0800	15-Apr	0735	300	8	684	3	1335	352	0
15-Apr	0800	16-Apr	0725	262	8	805	0	1693	444	0
16-Apr	0735	17-Apr	0738	679	5	1194	2	2114	511	0
[1] 17-Apr	0757	18-Apr	0740	0	34	0	9	0	0	0
18-Apr	0800	19-Apr	0730	0	111	0	13	0	0	0
19-Apr	0750	20-Apr	0750	0	107	0	11	0	0	0
20-Apr	0750	21-Apr	0835	0	106	0	2	0	0	0
21-Apr	0835	22-Apr	0800	0	53	0	4	0	0	0
22-Apr	0800	23-Apr	0745	0	73	0	6	0	0	0
23-Apr	0745	24-Apr	0745	0	6	0		0	0	0
24-Apr	0745	25-Apr	0700	0	0	0	1	0	0	0
Total				4701	588	9493	262	19085	5942	0

[1] Trap modified to retain smolts only.

Table 6. Daily catch of non-salmon species in the Dice Creek fence trap, 2001.

Date	Species													
	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	UNK	RBS
1-Mar	9	4	0	0	0	0	0	0	0	0	0	0	0	0
2-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Mar	3	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Mar	4	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar	4	1	0	0	0	0	0	0	0	0	0	0	1	0
5-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5-Mar	3	1	0	0	0	0	0	0	0	0	0	0	0	0
6-Mar	0	2	0	1	0	0	0	0	0	0	0	0	0	0
6-Mar	3	0	0	1	0	0	0	0	0	0	0	0	0	0
7-Mar	2	1	0	2	0	0	0	0	0	0	0	0	0	0
7-Mar	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Mar	5	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Mar	0	2	0	0	0	0	0	0	0	0	0	0	0	0
11-Mar	1	0	0	3	0	0	0	0	0	0	0	0	0	0
11-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12-Mar	0	2	0	1	0	0	0	0	0	0	0	0	0	0
13-Mar	1	4	0	2	0	0	0	0	0	0	0	0	0	0
14-Mar	1	3	0	0	0	0	0	0	0	0	0	0	0	0
15-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0	0
16-Mar	1	1	0	0	0	0	0	0	0	0	0	0	0	0
17-Mar	0	2	0	1	0	0	0	0	0	0	0	0	0	0
18-Mar	3	3	0	0	0	0	1	0	0	0	0	0	0	0
19-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Mar	2	4	0	2	0	0	0	0	0	1	0	0	0	0
21-Mar	0	11	0	0	0	1	0	0	4	0	0	0	0	0
22-Mar	1	10	0	0	0	0	0	0	0	0	0	0	0	0
23-Mar	0	13	0	0	0	0	0	0	0	0	0	0	0	0
24-Mar	1	1	0	0	0	0	0	0	0	0	0	0	0	0
25-Mar	1	15	0	0	1	0	0	0	0	0	0	0	0	0
26-Mar	2	9	1	0	0	0	0	0	0	0	0	0	0	0
27-Mar	0	8	0	0	0	0	0	0	0	0	0	0	0	0
28-Mar	1	2	0	0	0	0	0	0	0	0	0	0	0	0
29-Mar	2	7	0	0	0	0	0	0	0	0	0	0	0	0
30-Mar	0	2	1	0	0	0	0	0	0	0	0	0	0	0
31-Mar	0	9	0	0	0	0	0	0	0	0	0	0	0	0
1-Apr	1	11	0	1	0	0	0	0	0	0	1	0	0	0
2-Apr	1	4	0	0	0	0	0	0	0	0	3	0	0	0
3-Apr	0	5	0	0	0	0	0	0	0	0	1	0	0	0
4-Apr	1	4	0	0	0	0	0	0	0	0	0	0	0	0
5-Apr	0	5	0	0	0	0	0	0	0	0	0	0	0	0

Table 6. (cont.)

Date	Sc	LR	Stk	DV	RBT	Cut	Mwf	Eul	PMC	NPM	Bull	LNS	UNK	RBS
	Species													
6-Apr	0	1	0	1	0	0	0	0	0	0	0	0	0	0
7-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr	0	1	0	0	0	0	0	0	0	0	0	0	0	0
9-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Apr	0	1	0	0	3	0	0	0	0	0	0	0	0	0
11-Apr	0	8	1	0	0	0	0	0	0	0	0	0	0	0
12-Apr	0	0	1	0	6	0	0	0	0	0	0	0	0	0
13-Apr	0	2	0	1	12	1	0	0	0	0	0	0	0	0
14-Apr	0	8	0	0	2	1	0	0	0	0	0	0	0	0
15-Apr	0	5	0	0	0	0	0	0	0	0	0	0	0	0
16-Apr	0	7	0	0	0	0	0	0	0	0	0	0	0	0
17-Apr	1	4	0	0	0	0	0	0	0	0	0	0	0	0
18-Apr	1	0	0	0	0	2	0	0	0	0	0	0	0	0
19-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Apr	0	0	0	1	0	1	0	0	0	0	0	0	0	0
22-Apr	0	1	1	1	0	0	0	0	0	0	0	0	0	0
23-Apr	0	0	3	0	0	0	0	0	0	0	0	0	0	0
24-Apr	0	0	0	1	0	0	0	0	0	0	0	0	0	0
25-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	56	188	8	19	24	6	1	0	4	1	5	0	1	1

Sc = Sculpin, LR = Lamprey, Stk = Stickleback, DV = Dolly Varden char, Cut = Cutthroat trout
Mwf = Mountain Whitefish, Eul = Eulachon, PMC = Peamouth Chub, NPM = Northern Pike Minnow
Bull = Bull Trout, LNS = Long Nose Sucker, UKN = unknown, RBS = Rainbow Trout smolts

Table 7a. Comparison of mean length and weight, by time period, for chinook fry and smolts sampled from Devereux and Dice creeks and from the Klinaklini River, 2001.

Chinook Fry

Sample Dates	Period Number	Devereux Creek Ln. (mm)	Devereux Creek Wt. (g)	Klinaklini River Ln. (mm)	Klinaklini River Wt. (g)	Dice Creek Ln. (mm)	Dice Creek Wt. (g)
Start to March 7	1	38.85	0.39	38.75	0.39	ns	ns
March 8 to 17	2	39.13	0.40	39.37	0.40	38.53	0.37
March 18 to 27	3	38.86	0.39	38.45	0.39	38.33	0.37
March 28 to April 6	4	38.58	0.39	38.43	0.40	37.48	0.35
April 7 to 16	5	38.49	0.39	38.98	0.41	41.29	0.48
April 17 to 26	6	39.19	0.42	39.50	0.45	43.00	0.56
April 27 to May 6	7	41.53	0.57	42.21	0.64	ns	ns
May 7 to 16	8	43.34	0.73	46.04	0.91	ns	ns
May 17 to 26	9	48.38	1.08	50.97	1.39	ns	ns
May 27 to End	10	52.50	1.46	56.16	1.88	ns	ns
Average		41.93	0.62	43.88	0.73	38.88	0.43

Chinook Smolt

Sample Dates	Period Number	Devereux Creek Ln. (mm)	Devereux Creek Wt. (g)	Klinaklini River Ln. (mm)	Klinaklini River Wt. (g)	Dice Creek Ln. (mm)	Dice Creek Wt. (g)
Start to March 7	1	ns	ns	ns	ns	ns	ns
March 8 to 17	2	ns	ns	ns	ns	ns	ns
March 18 to 27	3	ns	ns	ns	ns	97.08	8.90
March 28 to April 6	4	ns	ns	ns	ns	ns	ns
April 7 to 16	5	104.32	13.71	88.79	7.92	95.35	9.90
April 17 to 26	6	107.99	14.30	85.80	6.54	114.57	14.44
April 27 to May 6	7	108.09	13.27	96.88	9.48	ns	ns
May 7 to 16	8	109.28	12.83	98.55	10.02	ns	ns
May 17 to 26	9	107.48	12.01	96.03	9.54	ns	ns
May 27 to End	10	106.72	12.13	103.09	11.06	ns	ns
Average		107.75	13.04	96.01	9.09	107.69	11.08

ns = no sample

Table 7b. Comparison of mean length and weight, by time period, for coho fry and smolts sampled from Devereux and Dice creeks and from the Klinaklini River, 2001.

Coho Fry

Sample Dates	Period Number	Devereux Creek Ln. (mm)	Devereux Creek Wt. (g)	Klinaklini River Ln. (mm)	Klinaklini River Wt. (g)	Dice Creek Ln. (mm)	Dice Creek Wt. (g)
Start to March 7	1	37.89	0.44	35.74	0.34	34.14	0.25
March 8 to 17	2	ns	ns	ns	ns	ns	ns
March 18 to 27	3	36.55	0.34	ns	ns	35.25	0.30
March 28 to April 6	4	35.42	0.31	35.59	0.32	34.42	0.28
April 7 to 16	5	37.09	0.35	36.89	0.36	34.03	0.28
April 17 to 26	6	35.57	0.32	36.29	0.33	ns	ns
April 27 to May 6	7	35.68	0.34	35.38	0.34	ns	ns
May 7 to 16	8	35.26	0.34	35.51	0.35	ns	ns
May 17 to 26	9	35.62	0.34	36.54	0.41	ns	ns
May 27 to End	10	38.50	0.51	43.77	0.84	ns	ns
Average		36.27	0.37	36.72	0.41	34.63	0.28

Coho Smolt

Sample Dates	Period Number	Devereux Creek Ln. (mm)	Devereux Creek Wt. (g)	Klinaklini River Ln. (mm)	Klinaklini River Wt. (g)	Dice Creek Ln. (mm)	Dice Creek Wt. (g)
Start to March 7	1	ns	ns	75.68	4.30	ns	ns
March 8 to 17	2	71.00	3.85	75.39	3.89	71.21	3.84
March 18 to 27	3	72.06	4.48	ns	ns	79.00	5.33
March 28 to April 6	4	75.92	5.21	70.08	3.69	80.97	5.75
April 7 to 16	5	86.52	8.21	ns	ns	79.09	5.61
April 17 to 26	6	83.80	6.91	81.53	6.01	95.50	8.31
April 27 to May 6	7	91.13	8.08	81.39	5.73	ns	ns
May 7 to 16	8	72.86	3.84	85.20	6.33	ns	ns
May 17 to 26	9	76.80	4.74	74.43	4.22	ns	ns
May 27 to End	10	89.26	7.80	76.06	4.61	ns	ns
Average		84.61	5.90	77.03	4.85	80.66	5.77

ns = no sample

Table 8a. Age frequency of chinook and coho smolts sampled at the Klinaklini River RST site, 2001.

	Chinook			Coho		
Age	Freq.	%	Brood Year	Freq.	%	Brood Year
0.0	8	11.9%	2000	2	1.6%	2000
1.0	46	68.7%	1999	103	83.1%	1999
2.0	13	19.4%	1998	19	15.3%	1998
Total	67	100.0%		124	100.0%	

Table 8b. Age frequency of chinook and coho smolts sampled at the Devereux Creek RST site, 2001.

	Chinook			Coho		
Age	Freq.	%	Brood Year	Freq.	%	Brood Year
0.0	3	3.1%	2000	2	1.5%	2000
1.0	71	74.0%	1999	121	91.7%	1999
2.0	22	22.9%	1998	9	6.8%	1998
Total	99	100.0%		132	100.0%	

Table 9. Environmental data collected at the Devereux Creek RST site, 2001.

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Rev's For 5 Min.	RPM	Water Temp (C)	Depth (cm)	Clarity Code	Weather Code
26-Feb	2015	000000	002740	002740	0.075	0.50	0.10	3.0	2.0	1	1
27-Feb	0830	002754	005175	002421	0.066	0.00	0.00	1.0	2.0	1	1
27-Feb	2015	009401	011972	002571	0.070	0.50	0.10	1.0	2.0	1	1
28-Feb	0900	011988	014669	002681	0.073	0.00	0.00	3.0	1.5	1	3
1-Mar	0750	031843	034427	002584	0.071			3.0	0.0	1	3
2-Mar	0928	045609	048065	002456	0.067	0.75	0.15	2.5	0.5	1	3
3-Mar	0810	059304	061358	002054	0.056	0.50	0.10	2.0	1.0	1	2
4-Mar	0830	075503	077786	002283	0.062	0.25	0.05	2.0	1.0	1	1
5-Mar	0810	082561	084706	002145	0.059	2.50	0.50	1.5	0.0	1	1
6-Mar	0745	092456	094745	002289	0.062	1.50	0.30	2.0	0.0	1	1
7-Mar	0805	103466	106254	002788	0.076	3.00	0.60	2.0		1	1
8-Mar	0856	116519	119310	002791	0.076	2.50	0.50	3.8	1.0	1	2
9-Mar	0830	129213	132649	003436	0.094	4.50	0.90	3.5	1.0	1	1
10-Mar	0820	142222	145795	003573	0.098	4.50	0.90	3.8	2.0	1	1
11-Mar	0800	158575	162071	003496	0.095	4.80	0.96	4.0	2.0	1	1
12-Mar	0800	172631	176241	003610	0.099			3.5	2.0	1	1
13-Mar	0800	187825	192512	004687	0.128	7.50	1.50	3.0	10.0	1	2
14-Mar	0800	207421	212221	004800	0.131	7.50	1.50	3.0	10.0	1	1
15-Mar	0800	224120	229014	004894	0.134	10.00	2.00	3.0	11.0	1	2
16-Mar	0830	241629	246510	004881	0.133	9.00	1.80	3.0	11.0	1	2
17-Mar	0800	256742	261598	004856	0.133	10.50	2.10	4.0	11.0	1	2
18-Mar	0800	279348	285588	006240	0.170	12.00	2.40	3.0	18.0	1	2
19-Mar	0900	299711	308185	008474	0.231			3.5	25.0	1	2
20-Mar	0800	325771	332467	006696	0.183	10.50	2.10	3.5	23.0	1	1
21-Mar	0800	347435	353347	005912	0.161	9.50	1.90	3.0	20.0	1	1
22-Mar	0800	366175	371268	005093	0.139	10.00	2.00	3.0	18.0	1	1
23-Mar	0830	383720	388098	004378	0.120	8.50	1.70	2.5	15.0	1	1
24-Mar	0930	400218	404282	004064	0.111	6.25	1.25	3.0	12.0	1	2
25-Mar	0931	417202	421238	004036	0.110	6.25	1.25	4.0	12.0	1	2
26-Mar	0858	433332	437611	004279	0.117	7.25	1.45	4.0	12.5	1	2
27-Mar	0823	454873	459049	004176	0.114	7.25	1.45	4.0	11.0	1	3
28-Mar	0832	477674	482080	004406	0.120	7.00	1.40	4.0	11.0	1	2
29-Mar	0900	494582	498895	004313	0.118	7.00	1.40	4.0	11.0	1	3
30-Mar	0848	510697	514464	003767	0.103	6.75	1.35	3.5	11.0	1	1
31-Mar	0845	526567	531153	004586	0.125	7.00	1.40	4.0	13.0	1	3
1-Apr	0845	542700	546740	004040	0.110	6.00	1.20	4.0	12.0	1	2
2-Apr	0840	558644	562574	003930	0.107	6.75	1.35	3.0	11.0	1	1
3-Apr	0840	583772	587426	003654	0.100	6.50	1.30	3.5	11.0	1	1
4-Apr	0835	598394	602624	004230	0.115	9.75	1.95	4.0	10.0	1	1
5-Apr	0838	612814	616935	004121	0.113	9.5	1.90	5.0	9.0	1	3
6-Apr	0752	632945	637074	004129	0.113	9.00	1.80	4.0	9.0	1	2
7-Apr	0853	646902	650803	003901	0.107	8.75	1.75	5.0	9.0	1	1
8-Apr	0830	661404	665145	003741	0.102	8.50	1.70	5.0	8.0	1	1
9-Apr	0845	676595	679990	003395	0.093	7.75	1.55	4.0	7.0	1	2

Table 9. (cont.)

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Rev's For 5 Min.	RPM	Water Temp (C)	Depth (cm)	Clarity Code	Weather Code
10-Apr	0845	691172	694719	003547	0.097	7.75	1.55	4.0	7.0	1	2
11-Apr	0830	705526	708778	003252	0.089	7.25	1.45	4.0	6.0	1	1
12-Apr	0805	717712	720840	003128	0.085	7.25	1.45	4.0	6.5	1	2
13-Apr	1100	736178	739177	002999	0.082	7.25	1.45				
14-Apr	0820	750273	753218	002945	0.080	6.50	1.30	4.0	5.0	1	1
15-Apr	0815	770721	773639	002918	0.080	6.25	1.25	4.0	40.0	1	1
16-Apr	0800	783496	786225	002729	0.075	5.75	1.15	4.4	38.0	1	2
17-Apr	0815	797758	800497	002739	0.075	5.00	1.00	4.4	40.0	1	2
18-Apr	0820	812137	815273	003136	0.086	5.75	1.15	4.2	50.0	1	2
19-Apr	0813	826468	829305	002837	0.077	5.75	1.15	4.4	55.0	1	2
20-Apr	0840	843420	846376	002956	0.081	6.75	1.35	4.2	5.5	1	1
21-Apr	0915	860421	863339	002918	0.080	5.25	1.05	6.0	5.0		1
22-Apr	0920	886520	889977	003457	0.094	6.00	1.20	8.0	5.0		3
23-Apr	0915	900000	903823	003823	0.104	7.00	1.40	7.0	5.5	1	3
24-Apr	0918	922252	927403	005151	0.141	9.50	1.90	7.5	13.0	2	3
25-Apr	0845	939889	947724	007835	0.214	16.00	3.20	7.5	29.0	2	3
26-Apr	1000	947739	957105	009366	0.256			7.5	27.0	1	1
27-Apr	1145	003525	011394	007869	0.215	15.00	3.00	8.3	26.0	1	2
28-Apr	0850	044538	052568	008030	0.219	15.00	3.00	8.0	32.0	1	2
29-Apr	0800	065167	073301	008134	0.222	14.00	2.80	7.5	29.0	1	3
30-Apr	0850	101119	108458	007339	0.200	9.50	1.90	8.5	26.0	1	2
1-May	0745	122885	129283	006398	0.175	7.00	1.40	7.0	23.0	1	3
2-May	0803	143065	148945	005880	0.161	8.75	1.75	7.7	19.0	1	2
3-May	0830	158585	163699	005114	0.140	5.50	1.10	8.0	17.0	1	3
4-May	0721	177342	182788	005446	0.149	8.50	1.70	8.0	17.0	1	3
5-May	0730	210596	216468	005872	0.160	6.00	1.20	7.0	21.0	1	1
6-May	1000	229682	235237	005555	0.152	9.00	1.80	8.5	18.0	1	1
7-May	1130	248074	253352	005278	0.144	8.50	1.70	9.0	15.0	1	1
8-May	1130	266236	271715	005479	0.150	7.50	1.50	9.5	14.0	1	1
9-May	1200	284084	289145	005061	0.138	7.00	1.40	9.5	12.0	1	1
10-May	1103	301057	305337	004280	0.117	6.50	1.30	9.5	11.0	1	1
11-May	1200	317844	321986	004142	0.113	7.00	1.40	10.0	9.0	1	1
12-May	1700	336262	340522	004260	0.116	7.50	1.50	11.0	10.0	1	1
13-May	1600	354525	358533	004008	0.109	7.50	1.50	11.0	10.0	1	1
14-May	1200	372200	376530	004330	0.118	8.50	1.70	10.0	11.0		
15-May	1200	390111	394284	004173	0.114	8.50	1.70	10.5	11.0		
16-May	1130	408588	412514	003926	0.107	7.00	1.40	10.5	10.0		
17-May	0800	425990	429770	003780	0.103	7.50	1.50	10.0	9.0		
18-May	0745	443657	447467	003810	0.104	7.50	1.50	10.0	9.0		
19-May	0900	463830	468626	004796	0.131	11.00	2.20	9.0	11.0	1	1
20-May	0930	483666	487967	004301	0.117	8.00	1.60	9.0	9.0	1	1
21-May	0930	502230	506425	004195	0.115	7.70	1.54	10.0	8.0	1	1
22-May	1100	520315	524822	004507	0.123	7.00	1.40	12.0	9.0	1	1
23-May	0910	539169	544298	005129	0.140	5.50	1.10	11.0	13.0	1	2
24-May	0900	559544	571947	012403	0.339	5.50	1.10	12.0	15.0	1	2

Table 9. (cont.)

		Flow			Flow Rate (mps)	Rev's For 5 Min.	RPM	Water Temp (C)	Depth (cm)	Clarity Code	Weather Code
Date	Time	Start	End	Diff.							
25-May	0817	576943	582733	005790	0.158	4.50	0.90	12.0	19.0	1	2
26-May	1030	614967	620867	005900	0.161	7.50	1.50	12.0	19.0	1	2
27-May	1000	636376	642781	006405	0.175	9.70	1.94	12.0	19.0	1	2
28-May	1100	677715	683325	005610	0.153	8.00	1.60		22.0	1	3
29-May	1100	698123	704245	006122	0.167	9.70	1.94	12.0	20.0	1	1
30-May	1000	718182	723840	005658	0.154	13.70	2.74	12.0	18.0	1	
31-May	1000	739593	745328	005735	0.157	20.00	4.00	12.0	17.0	1	2
1-Jun	0700							10.0	47.0	2	3
2-Jun	0710	745287	755716	010429	0.285	22.50	4.50	11.0	46.0	2	2
3-Jun	0730	755715	765853	010138	0.277	22.25	4.45	11.0	37.0	1	2
4-Jun	1030	784188	793274	009086	0.248	20.00	4.00	12.0	28.5	1	1
5-Jun	1030	810660	817894	007234	0.198	16.50	3.30	12.0	25.5	1	2
6-Jun	1130	833958	840162	006204	0.169	14.75	2.95	12.0	22.5	1	3
7-Jun	1130	856843	862676	005833	0.159	14.75	2.95	13.0	20.5	1	1
8-Jun	0945	880096	885550	005454	0.149	13.50	2.70	12.0	20.0	1	2
9-Jun	1045	904839	913077	008238	0.225	18.00	3.60	12.0	31.0	2	2
10-Jun	0945	932700	941450	008750	0.239	17.75	3.55	12.0	29.0	2	2
11-Jun	0845	957830	966241	008411	0.230	16.50	3.30	12.0	27.0	1	2
12-Jun	0845	980518	986558	006040	0.165	15.00	3.00	12.0	24.0	1	1
13-Jun	0930	002620	10135	007515	0.205	15.25	3.05	13.0	22.0	1	1
14-Jun	1230	026003	32359	006356	0.174	13.25	2.65	12.0	20.0	1	1

Clarity Code: 1=clear; 2=cloudy. Weather Code: 1=clear; 2=cloudy; 3=rain.

Table 10. Environmental data collected at the Klinaklini River RST site, 2001.

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Rev's For 5 Min.	RPM	Water Temp (C)	Depth (cm)	Secchi Depth (cm)	Weather Code
28-Feb	1417	014638	017213	002575	0.070	1.50	0.30	2.0	305.0	81.5	2
1-Mar	0746	021109	025409	004300	0.117			1.0		81.0	3
2-Mar	0715	037344	042332	004988	0.136	1.00	0.20	1.0	304.0	61.0	3
3-Mar	0702	048082	055413	007331	0.200	9.50	1.90	1.0	308.0	67.0	2
4-Mar	0711	061366	068003	006637	0.181	6.50	1.30	1.0	307.0	72.0	1
5-Mar	0705					8.50	1.70	0.5	305.0	70.0	1
6-Mar	0658	084711	089584	004873	0.133	6.00	1.20	0.5	303.0	75.0	1
7-Mar	0703	094734	100248	005514	0.151	6.00	1.20	1.0	306.0	77.0	1
8-Mar	0715	106254	113378	007124	0.195	7.00	1.40	2.0	306.0	65.0	2
9-Mar	0720					6.50	1.30	2.0	307.0	58.0	1
10-Mar	0720	132654	138779	006125	0.167	6.50	1.30	3.5	306.0	56.0	1
11-Mar	0700	145792	152996	007204	0.197	6.50	1.30	2.0	308.0	55.0	1
12-Mar	0700	162064	169564	007500	0.205	6.50	1.30	3.5	309.0	59.0	1
13-Mar	0700	176250	184088	007838	0.214	4.50	0.90	3.8	308.0	57.0	2
14-Mar	0700	192511	203446	010935	0.299	13.00	2.60	3.0	308.0	56.0	1
15-Mar	0700	212225	221603	009378	0.256	8.00	1.60	3.0	306.0	57.0	2
16-Mar	0700	229015	238318	009303	0.254	9.50	1.90	3.0	305.0	42.0	2
17-Mar	0700	246518	254346	007828	0.214	6.50	1.30	3.0	304.0	47.0	2
18-Mar	0700	261606	271041	009435	0.258	10.00	2.00	3.0	305.0	43.0	2
19-Mar	0700	285583	295506	009923	0.271	8.00	1.60	2.5	310.0	45.0	2
20-Mar	0700	308185	320108	011923	0.326	10.50	2.10	2.5	305.0	47.0	1
21-Mar	0700	332465	342775	010310	0.281	12.00	2.40	2.0	302.0	47.0	1
22-Mar	0700	353362	363092	009730	0.266	10.00	2.00	2.0	300.0	51.0	1
23-Mar	0730	371262	379645	008383	0.229	8.00	1.60	2.0	270.0	50.0	1
24-Mar	0755	388073	395816	007743	0.211	8.00	1.60	2.5	301.0	76.0	2
25-Mar	0730	404285	412953	008668	0.237	9.25	1.85	3.5	304.0	66.0	2
26-Mar	0730	421235	431202	009967	0.272	13.50	2.70	3.0	308.0	70.0	2
27-Mar	0700	437630	445783	008153	0.223	8.50	1.70	3.5	307.0	65.0	3
28-Mar	0715	459047	467937	008890	0.243	13.00	2.60	2.5	306.0	75.0	2
29-Mar	0730	482081	490777	008696	0.237	9.00	1.80	3.5	305.0	67.0	3
30-Mar	0718	498892	506773	007881	0.215	10.50	2.10	2.5	305.0	71.0	1
31-Mar	0715	514459	523478	009019	0.246	10.50	2.10	4.0	306.0	77.0	3
1-Apr	0715	531147	539567	008420	0.230	9.25	1.85	4.0	307.0	77.0	2
2-Apr	0725	546741	555269	008528	0.233	9.25	1.85	3.0	304.0	76.0	1
3-Apr	0718	573069	580843	007774	0.212	9.00	1.80	2.5	304.0	72.0	1
5-Apr	0718	602625	610317	007692	0.210	6.25	1.25	5.0	303.0	70.0	3
6-Apr	0645	621330	629815	008485	0.232	8.75	1.75	4.0	305.0	76.0	2
7-Apr	0726	637088	644463	007375	0.201	7.00	1.40	4.5	313.0	47.5	1
8-Apr	0722	650817	659012	008195	0.224	8.00	1.60	4.0	313.0	42.5	1
9-Apr	0730	665141	673436	008295	0.226	8.50	1.70	4.0	313.0	52.0	1
10-Apr	0730	679966	687722	007756	0.212	7.75	1.55	4.0	313.0	47.0	2
11-Apr	0700	694726	702795	008069	0.220	7.00	1.40	4.0	313.0	47.0	1
12-Apr	0650	708792	714605	005813	0.159	5.75	1.15	4.0	313.0	46.5	2
13-Apr	0702	720841	728320	007479	0.204	6.25	1.25	4.0	312.0	51.0	2

Table 10. (cont.)

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Rev's For 5 Min.	RPM	Water Temp (C)	Depth (cm)	Secchi Depth (cm)	Weather Code
14-Apr	0700	739180	746454	007274	0.199	5.75	1.15	4.0	312.0	49.5	1
15-Apr	0700					5.00	1.00	4.0	313.0	51.5	1
16-Apr	0645	773640	780612	006972	0.190	4.50	0.90	4.2	313.0	46.5	2
17-Apr	0700	786238	793845	007607	0.208	3.00	0.60	4.2	313.0	54.5	2
18-Apr	0650	800502	809689	009187	0.251	3.50	0.70	4.2	322.0	50.0	2
19-Apr	0650	815268	824339	009071	0.248	4.50	0.90	4.2	324.0		2
20-Apr	0700	829310	840711	011401	0.311	12.25	2.45	4.2	324.5	38.5	1
21-Apr	0730	846372	858260	011888	0.325	4.50	0.90	4.5	328.0	44.0	1
22-Apr	0720	875345	884264	008919	0.244	4.00	0.80	6.0	329.0	48.0	2
23-Apr	0655	889969	899857	009888	0.270	2.00	0.40	5.7	330.0	50.0	3
24-Apr	0655	904350	915245	010895	0.297	1.50	0.30	5.5	339.0	33.0	3
27-Apr	9.00	990159	1003521	013362	0.365	17.00	3.40	5.5		32.5	2
28-Apr	0715	020664	035016	014352	0.392	13.00	2.60	5.0	396.0		2
29-Apr	0640	052566	065175	012609	0.344	14.50	2.90	5.0	380.0	48.0	3
30-Apr	0655	073302	086955	013653	0.373	18.50	3.70	4.5	375.0	46.0	2
1-May	0645	108536	122880	014344	0.392	17.25	3.45	4.0	366.0	33.0	2
2-May	0655	129288	143061	013773	0.376	17.50	3.50	4.2	365.0	42.0	2
3-May	0714	148950	158590	009640	0.263	9.00	1.80	5.0	350.0	37.0	3
4-May	0645	163699	177325	013626	0.372	16.00	3.20	5.0	385.0	33.0	3
4-May	0821	184203	192287	008084	0.221			6.0			3
5-May	0700	196290	210600	014310	0.391	17.50	3.50	4.0	355.0	24.0	3
6-May	0700	216470	229673	013203	0.360	19.00	3.80	4.5	348.0	23.0	1
7-May	0645	235237	248064	012827	0.350	18.50	3.70	6.0	340.0	24.0	1
8-May	0730	253352	266236	012884	0.352	14.00	2.80	6.0	340.0	26.0	1
9-May	0630	271715	284087	012372	0.338	16.50	3.30	5.0	345.0	25.0	1
10-May	0630	289145	301060	011915	0.325	16.00	3.20	8.0	345.0	26.0	1
11-May	0630	305334	317840	012506	0.341	15.00	3.00	8.0	344.0	27.0	1
12-May	0630	321985	336260	014275	0.390	16.50	3.30	8.5	348.0	27.0	1
13-May	0700	340524	354525	014001	0.382	18.00	3.60	6.0	367.0	25.0	1
14-May	0630	358539	372199	013660	0.373	18.50	3.70	6.0	368.0	25.0	
15-May	0630	376533	390113	013580	0.371	19.00	3.80	6.0	368.0	26.0	
16-May	0630	394283	408588	014305	0.391	21.50	4.30	6.0	365.0	25.0	
17-May	0615	412515	425990	013475	0.368	13.00	2.60	6.0	360.0	26.0	
18-May	0645	429771	443657	013886	0.379	22.50	4.50	6.0	358.0	26.0	
19-May	0650	447471	463830	016359	0.447	24.00	4.80	5.0		26.0	1
20-May	0700	468626	483666	015040	0.411	23.00	4.60	5.0	360.0	28.0	1
21-May	0650	487961	502230	014269	0.390	22.00	4.40	5.0	355.0	30.0	1
22-May	0700	506425	520315	013890	0.379	17.00	3.40	7.0	377.0	30.0	1
23-May	0650	524821	539167	014346	0.392	11.00	2.20	7.0	425.0	24.0	1
24-May	0700	544298	559544	015246	0.416	9.50	1.90	7.0	440.0	31.0	2
25-May	1900	582733	599039	016306	0.445	14.00	2.80	9.0	445.0	28.0	1
25-May		571947	576947	005000	0.137	21.70	4.34	7.0	450.0	26.0	1
26-May	0700	599038	614967	015929	0.435	5.50	1.10	6.0	444.0	30.0	2
27-May	0700	620867	636376	015509	0.423	13.00	2.60	6.0	440.0	27.0	2
28-May	0650	642758	660294	017536	0.479	4.50	0.90	6.0	450.0	25.0	3

Table 10. (cont.)

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Rev's For 5 Min.	RPM	Water Temp (C)	Depth (cm)	Secchi Depth (cm)	Weather Code
28-May	0710	660294	677715	017421	0.476	20.50	4.10	6.0	450.0	25.0	3
29-May	0700	683333	698123	014790	0.404	16.30	3.26	6.0	436.0	24.0	1
30-May	0700	704245	718182	013937	0.381	16.00	3.20	6.0	418.0	25.0	2
31-May	0700	723840	739593	015753	0.430	20.00	4.00	6.0	410.0	25.0	2
1-Jun	0700							7.0	518.0		3
2-Jun	1430							7.0	493.0		2
3-Jun									463.0		1
4-Jun	0850	765863	784170	018307	0.500	23.25	4.65	6.0	457.0	24.5	1
5-Jun	0700	793272	810650	017378	0.474	22.00	4.40	6.0	450.0	22.0	3
6-Jun	0730	817910	833950	016040	0.438	17.00	3.40	6.0	445.0	24.0	3
7-Jun	0700	840160	856836	016676	0.455	19.25	3.85	6.0	448.0	22.5	1
8-Jun	0945	862676	880090	017414	0.475	20.50	4.10	6.0	453.0	24.5	2
9-Jun	0700	885560	904835	019275	0.526	22.50	4.50	6.0	461.0	24.0	3
10-Jun	0645	913100	932694	019594	0.535	24.25	4.85	6.0	463.0	24.5	2
11-Jun	0700	941450	957823	016373	0.447	18.75	3.75	6.0	445.0	22.5	2
12-Jun	0645	966530	980514	013984	0.382	15.50	3.10	6.0	435.0	24.5	1
13-Jun	0700	986560	1002612	016052	0.438	18.75	3.75	7.0	443.0	23.0	1
14-Jun	0630	010140	25992	015852	0.433	17.25	3.45	6.0	444.0	21.5	1

Weather Code: 1=clear; 2=cloudy; 3=rain.

Table 11. Environmental data collected at the Dice Creek fence trap site, 2001.

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Water Temp (C)	Depth (cm)	Clarity Code	Weather Code
28-Feb	1950	017587	021045	003458	0.094	3.0		1	1
1-Mar	2030	034436	037361	002925	0.080	2.5	40.0	1	2
2-Mar	0800	042325	045596	003271	0.089	2.5	45.0	1	3
3-Mar	0730	055395	059301	003906	0.107	2.5	47.0	1	2
4-Mar	0800	068931	072760	003829	0.105	2.0	45.0	1	1
5-Mar	0748	079027	082555	003528	0.096	1.5	44.0	1	1
6-Mar	0728	089565	092452	002887	0.079	2.0	43.5	1	1
7-Mar	0739	100255	103459	003204	0.087	2.0	44.0	1	1
8-Mar	0800	113378	116519	003141	0.086	3.5	45.0	1	2
9-Mar	0800	126703	129213	002510	0.069	2.5	45.0	1	1
10-Mar	0800	138787	142210	003423	0.093	3.7	45.0	1	1
11-Mar	0730	154655	158567	003912	0.107	2.0	45.0	1	1
12-Mar	0730	169557	172631	003074	0.084	4.0	45.0	1	1
13-Mar	0730	184985	187824	002839	0.078	5.0	53.0	1	2
14-Mar	0830	203446	207425	003979	0.109	3.0	50.0	1	1
15-Mar	0730	221604	224110	002506	0.068	3.5		1	2
16-Mar	0730	238318	241363	003045	0.083	3.5	48.0	1	2
17-Mar	0730	254346	256742	002396	0.065	4.0	48.0	1	2
18-Mar	0730	274330	279353	005023	0.137	3.0	53.0	1	2
19-Mar	0800	295508	299705	004197	0.115	2.5	63.0	1	2
20-Mar	0730	320103	325773	005670	0.155	3.0	59.0	1	1
21-Mar	0730	344582	347427	002845	0.078	2.5	55.0	1	1
22-Mar	0730	363084	366172	003088	0.084	3.0	54.0	1	1
23-Mar	0800	379646	383722	004076	0.111	2.5	52.0	1	1
24-Mar	0855	395825	400200	004375	0.119	3.5	50.0	1	2
25-Mar	0820	412985	417200	004215	0.115	4.0	54.0	1	2
26-Mar	0815	431209	433318	002109	0.058	4.0	56.0	1	2
27-Mar	0732	445787	450280	004493	0.123	4.0	55.0	1	3
28-Mar	0750	472663	476980	004317	0.118	4.0	53.0	1	2
29-Mar	0805	490784	494585	003801	0.104	4.0	51.0	1	3
30-Mar	0743	506784	510683	003899	0.106	4.0	51.0	1	1
31-Mar	0743	523482	526558	003076	0.084	5.0	52.0	1	3
1-Apr	0744	539538	542697	003159	0.086	4.0	51.0	1	2
2-Apr	0755	555256	558625	003369	0.092	3.0	50.0	1	1
3-Apr	0749	580843	583773	002930	0.080	4.0	49.0	1	1
4-Apr	0731	587447	595268	007821	0.214	4.0			1
4-Apr	0800	595264	598397	003133	0.086	4.0	49.0	1	1
5-Apr	0745	610309	612825	002516	0.069	5.0	49.0	1	3
6-Apr	0712	629817	632029	002212	0.060	5.0	49.0	1	3
7-Apr	0815	644463	646912	002449	0.067	5.0	48.0	1	1
8-Apr	0758	659027	661436	002409	0.066	4.0	48.0	1	1
9-Apr	0815	673450	676598	003148	0.086	4.0	48.0	1	2
10-Apr	0815	687726	690860	003134	0.086	4.0	48.0	1	2
11-Apr	0750	702721	705515	002794	0.076	4.0	47.0	1	1
12-Apr	0726	714575	717714	003139	0.086	4.0	48.0	1	2

Table 11. (cont.)

Date	Time	Flow Start	Flow End	Flow Diff.	Flow Rate (mps)	Water Temp (C)	Depth (cm)	Clarity Code	Weather Code
13-Apr	0745	728302	736166	007864	0.215	4.0	47.0	1	2
14-Apr	0740	746480	750277	003797	0.104	4.0	46.0	1	1
15-Apr	0735	768532	770719	002187	0.060	4.0	47.0	1	1
16-Apr	0725	780613	783491	002878	0.079	4.2	47.0	1	2
17-Apr	0738	793843	797751	003908	0.107	4.2	52.0	1	2
18-Apr	0740	809686	812132	002446	0.067	4.2	51.0	1	2
19-Apr	0730	824339	826478	002139	0.058	4.2	51.0	1	2
20-Apr	0750	840706	843419	002713	0.074	4.2	50.0	1	1
21-Apr	0835	858267	860395	002128	0.058	5.0	51.0	1	1
22-Apr	0800	884264	886523	002259	0.062	6.0	51.0	1	2
23-Apr	0745	899855	900008	000153	0.004	7.0			
24-Apr	0745	915321	922263	006942	0.190	6.0	67.0	2	3
25-Apr	0700	927416	937321	009905	0.270	6.0	84.0	2	3
27-Apr	1645	011395	020659	009264	0.253		79.0	1	3
28-Apr	0805	035006	044536	009530	0.260	6.0	77.0	1	2
30-Apr	0748	086957	099476	012519	0.342	6.0	68.5	1	3

Clarity Code: 1=clear; 2=cloudy. Weather Code: 1=clear; 2=cloudy; 3=rain.

Table 12. Trap efficiencies of the Devereux Creek and Klinaklini River rotary screw traps for chinook and coho fry and smolts, 2001.

Period	Marked Releases	Recaptures	Trap Efficiency
Devereux Creek Chinook Fry			
Start to March 11	303	24	0.079
March 12 to 28	590	108	0.183
March 29 to April 13	520	88	0.169
April 14 to May 2	671	132	0.197
May 3 to May 20	656	68	0.104
May 21 to May 27	187	59	0.316
May 28 to End	248	94	0.379
Devereux Creek Chinook Smolts			
Start to May 23	238	22	0.092
May 24 to May 27	186	5	0.027
May 28 to June 3	121	2	0.017
June 4 to End	234	12	0.051
Devereux Creek Coho Fry			
Start to April 18	394	26	0.066
April 19 to April 30	490	52	0.106
May 1 to May 17	678	23	0.034
May 18 to May 27	506	56	0.111
May 28 to End	417	48	0.115
Klinaklini River Chinook Fry			
Start to March 31	254	4	0.016
April 1 to April 27	345	7	0.020
April 28 to End	382	1	0.003
Klinaklini River Chinook Smolts			
Total Period	258	14	0.054

Table 13a. Stratified population estimates for chinook and coho fry and for chinook smolts from Devereux Creek, 2001.

Chinook Fry

Period	Catch	Marked Releases	Recaptures	Period Estimate	Upper 95% CL	Lower 95% CL
Start to March 11	11988	303	24	145774		
March 12 to 28	89689	590	108	486295		
March 29 to April 13	69880	520	88	409073		
April 14 to May 2	47702	671	132	241021		
May 3 to May 20	2786	656	68	26528		
May 21 to May 27	834	187	59	2613		
May 28 to End	1097	248	94	2875		
Total				1314179	1444322	1184036

Chinook Smolts

Period	Catch	Marked Releases	Recaptures	Period Estimate	Upper 95% CL	Lower 95% CL
Start to May 23	4257	238	22	44236		
May 24 to May 27	206	189	5	6523		
May 28 to June 3	295	121	2	11997		
June 4 to End	322	234	12	5821		
Total				68577	89866	47288

Coho Fry

Period	Catch	Marked Releases	Recaptures	Period Estimate	Upper 95% CL	Lower 95% CL
Start to April 18	31515	394	26	461053		
April 19 to April 30	22373	490	52	207267		
May 1 to May 17	18437	678	23	521613		
May 18 to May 27	6182	506	56	54987		
May 28 to End	1381	417	48	11781		
Total				1256701	1522219	991183

Table 13b. Stratified population estimate for chinook fry and trap efficiency population estimate for chinook smolts from the Klinaklini River, 2001.

Chinook Fry

Period	Catch	Marked Releases	Recaptures	Period Estimate	Upper 95% CL	Lower 95% CL
Start to March 31	11367	254	4	579717		
April 1 to April 27	10315	345	7	446124		
April 28 to end	894	382	1	171201		
Total				1197042	1772822	621262

Chinook Smolts

Total Period	4361	258	14	80366	na	na

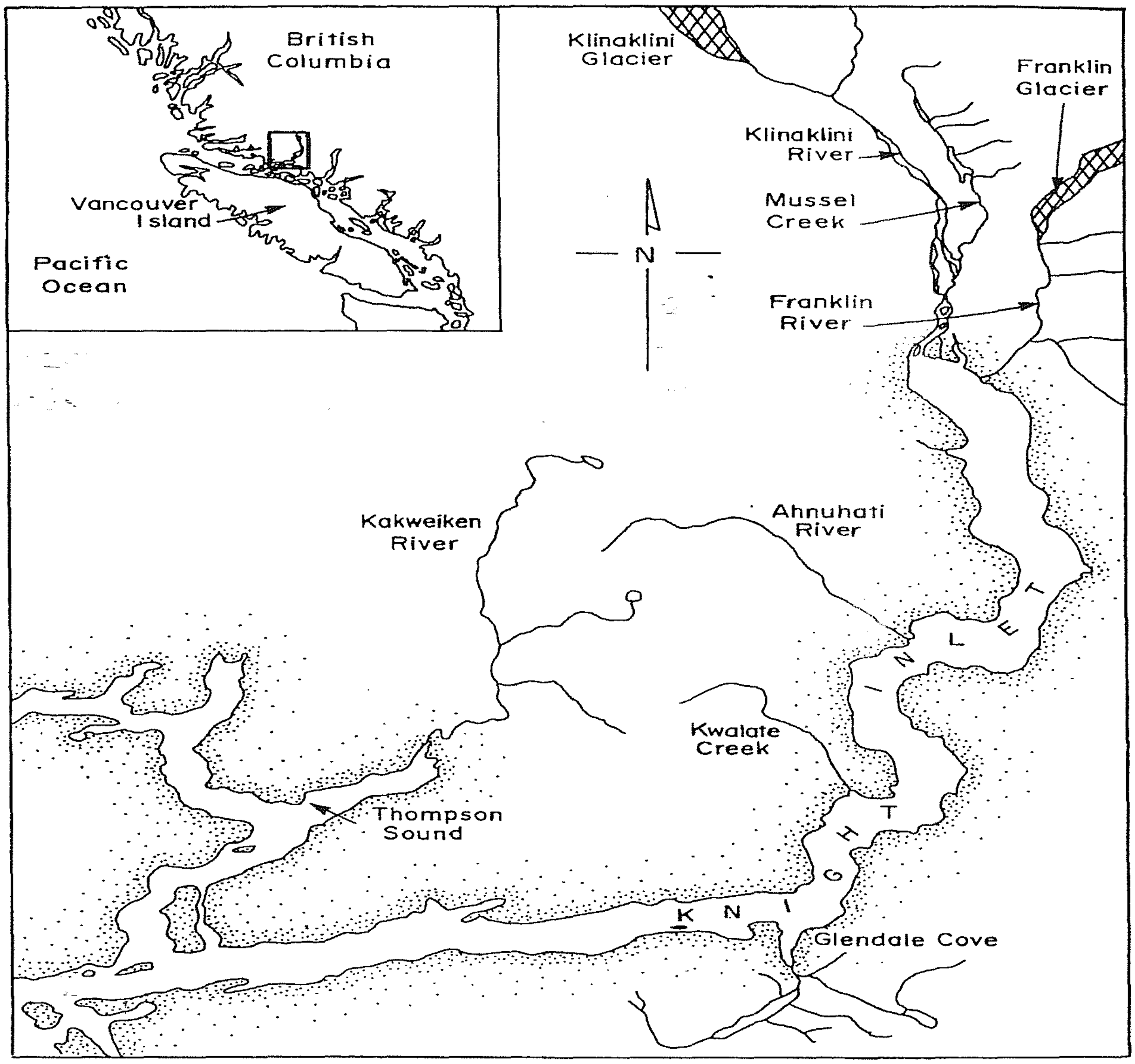

Figure 1 Knight Inlet study area.

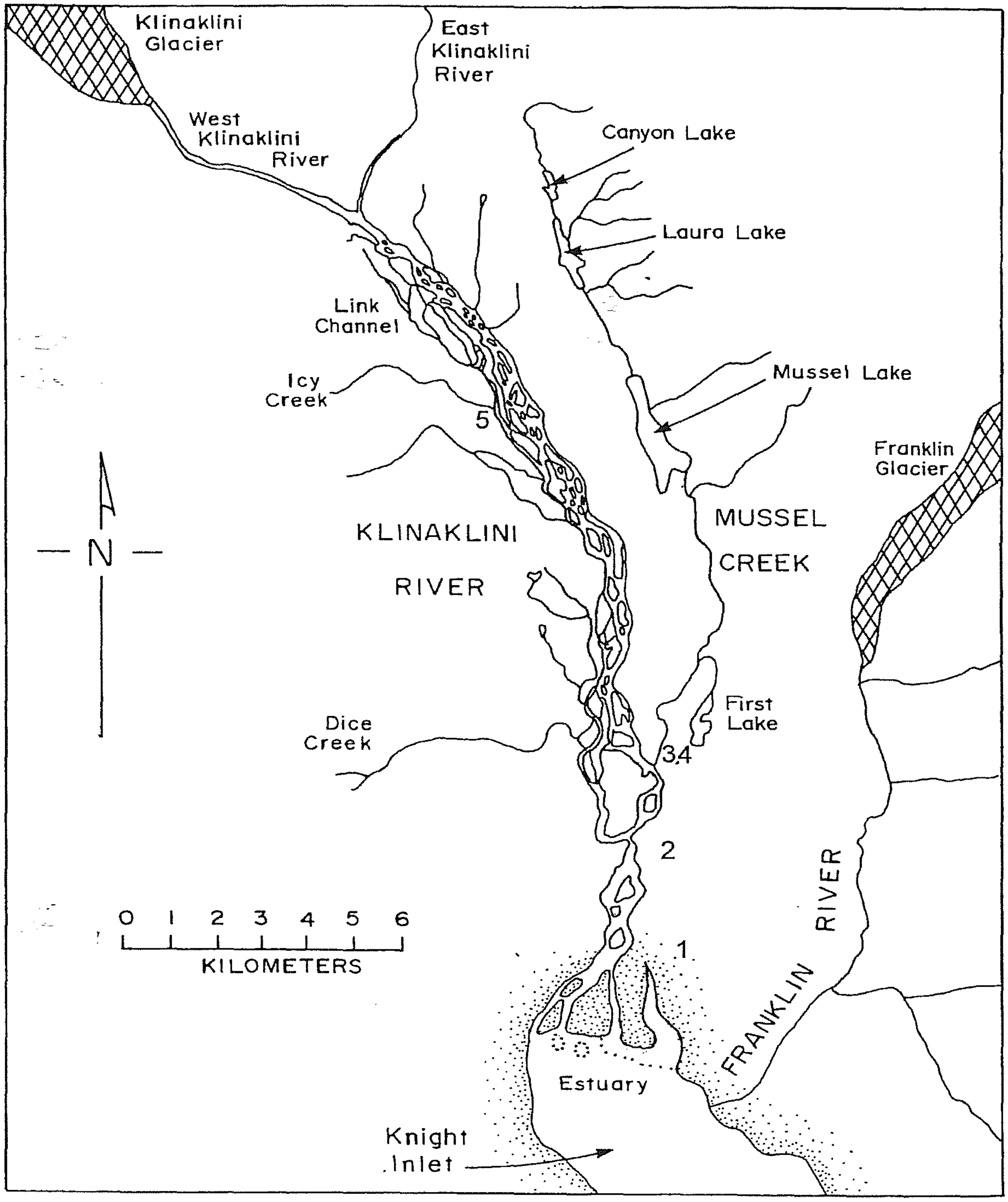

Figure 2. Location of 1)Interfor camp, 2)Klinaklini River RST and 3)Devereux Creek RST.

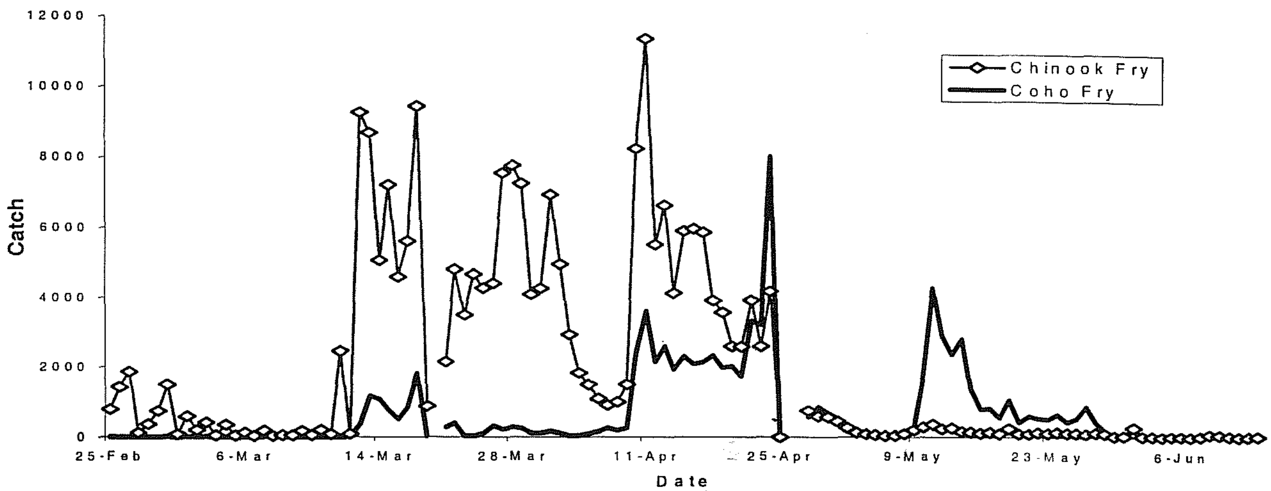

Figure 3a. Daily catch of chinook and coho fry at the Devereux Creek RST site, 2001.

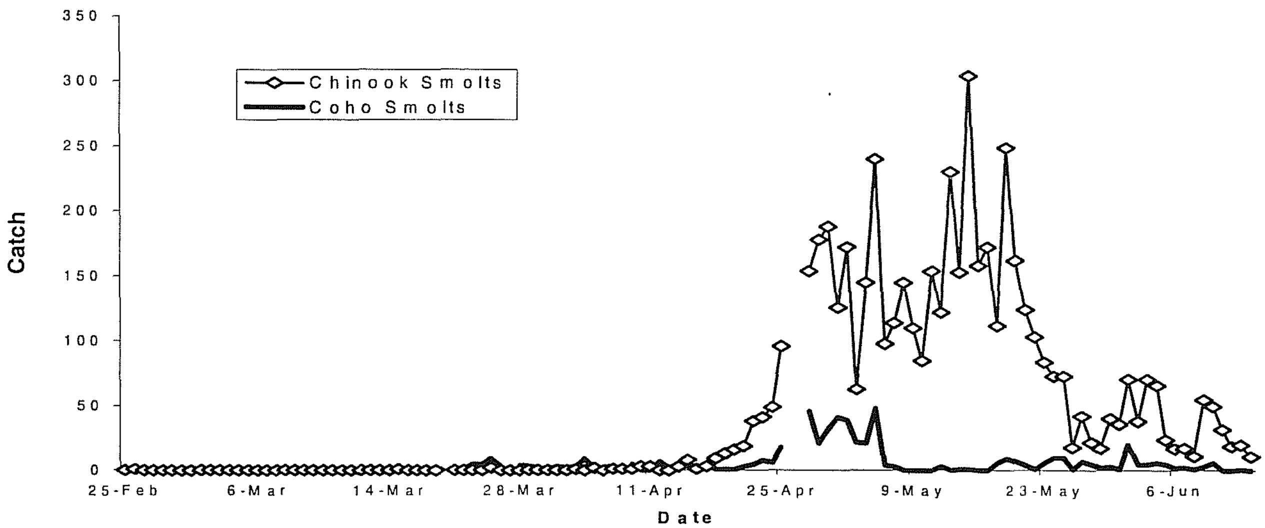

Figure 3b. Daily catch of chinook and coho smolts at the Devereux Creek RST site, 2001.

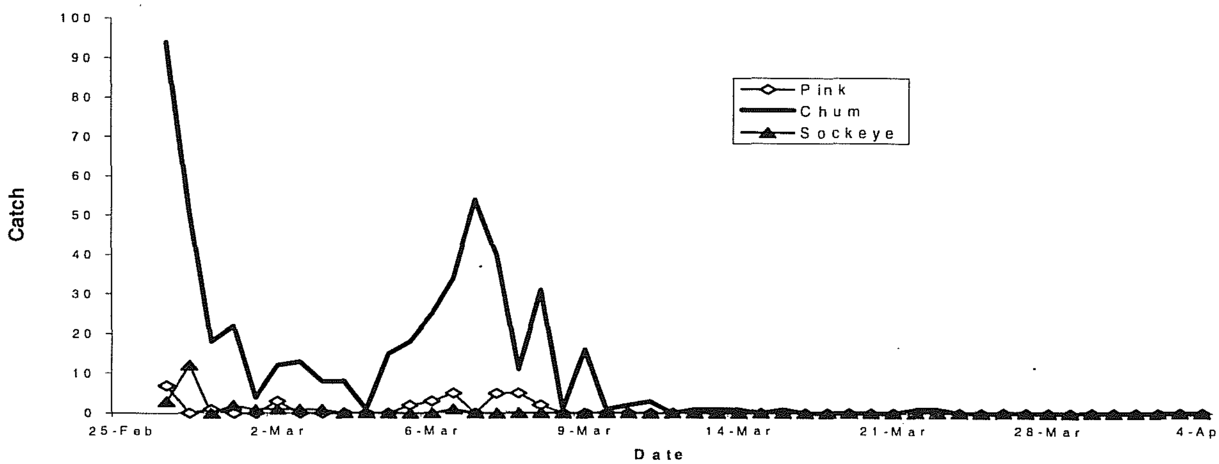

Figure 3c. Daily catch of pink, chum and sockeye at the Devereux Creek RST site, 2001.

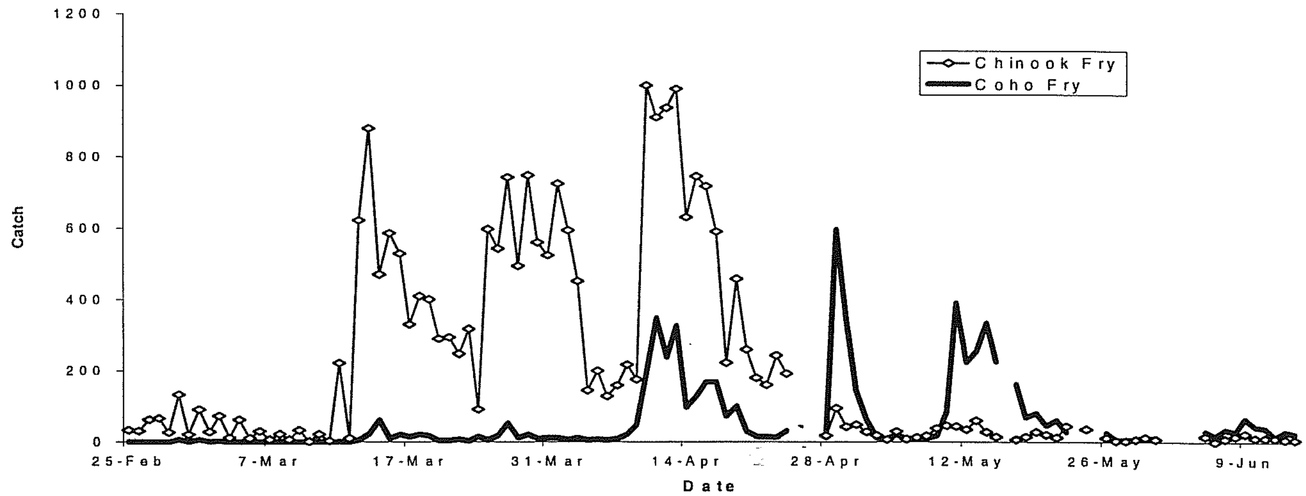

Figure 4a. Daily catch of chinook and coho fry at the Klinaklini River RST site, 2001.

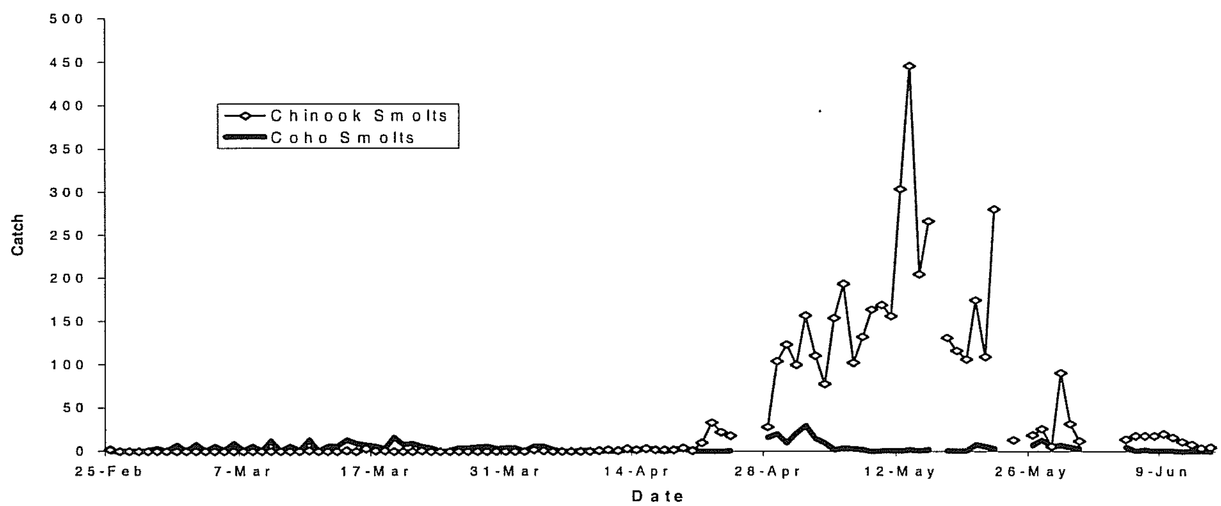

Figure 4b. Daily catch of chinook and coho smolts at the Klinaklini River RST site, 2001.

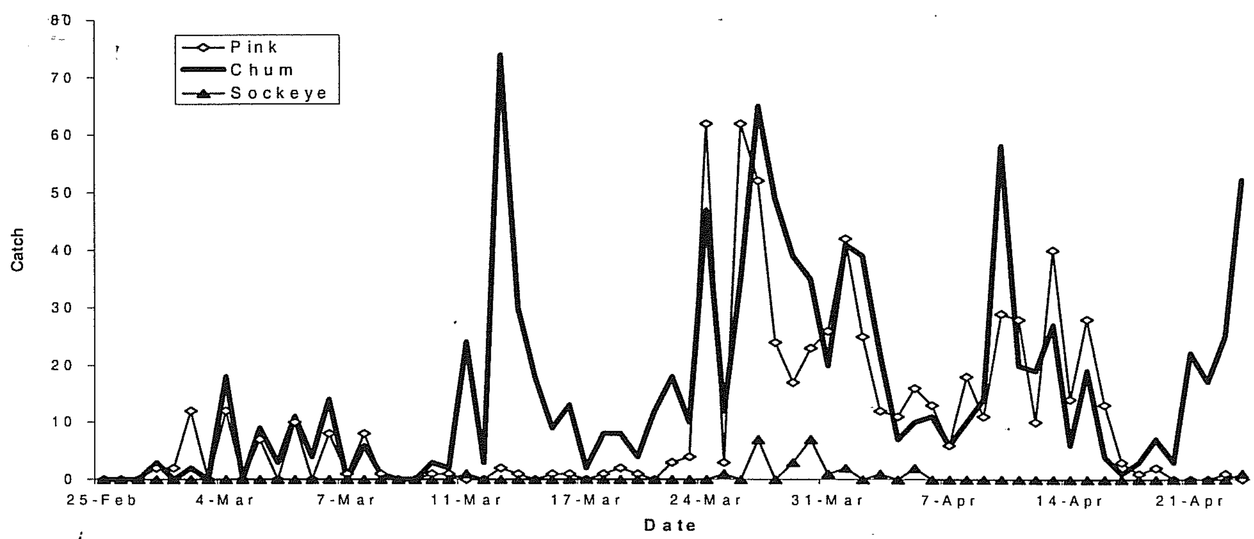

Figure 4c. Daily catch of pink, chum and sockeye at the Klinaklini River RST site, 2001.

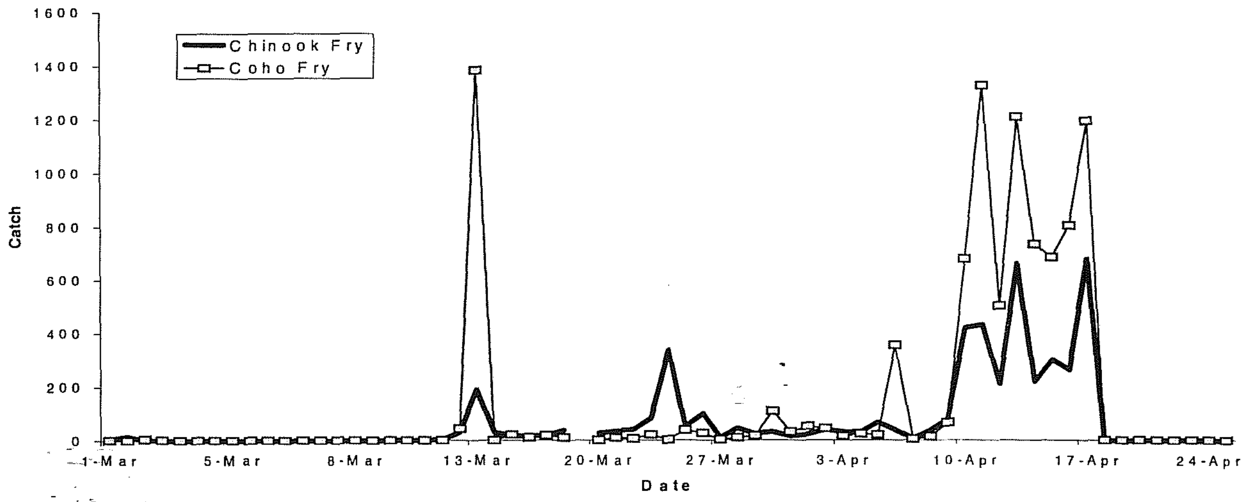

Figure 5a. Daily catch of chinook and coho fry at the Dice Creek trap site, 2001.

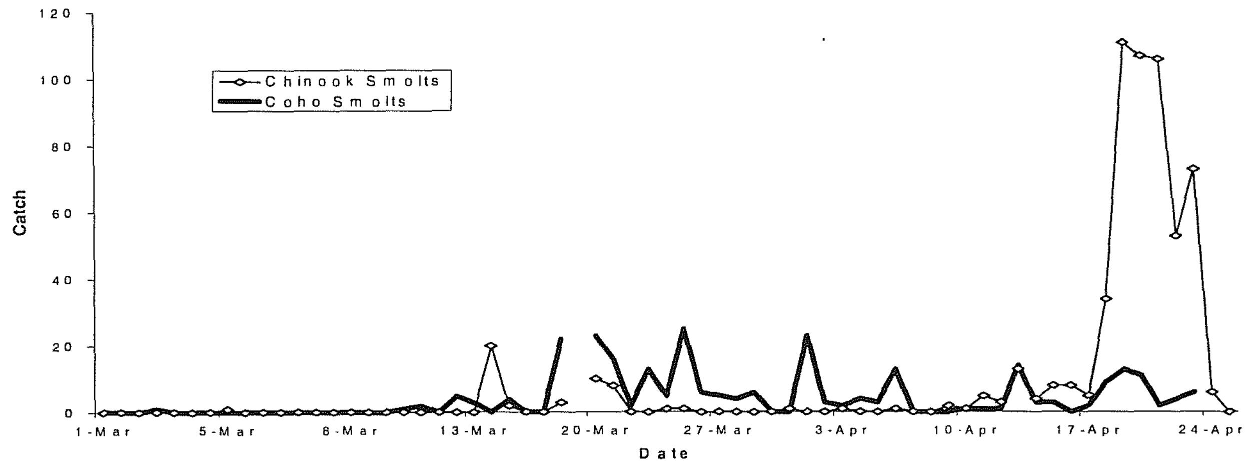

Figure 5b. Daily catch of chinook and coho smolts at the Dice Creek trap site, 2001.

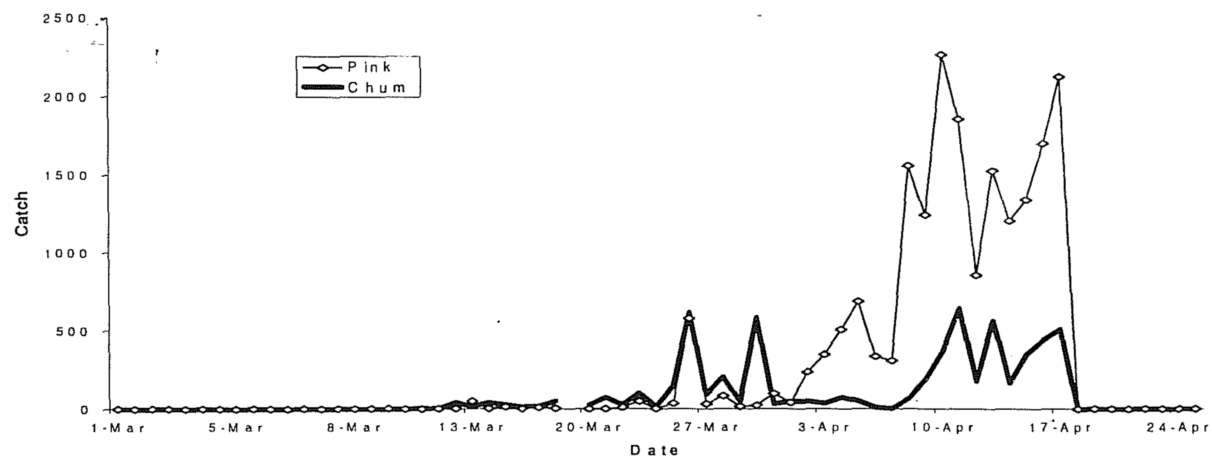

Figure 5c. Daily catch of pink and chum at the Dice Creek trap site, 2001.

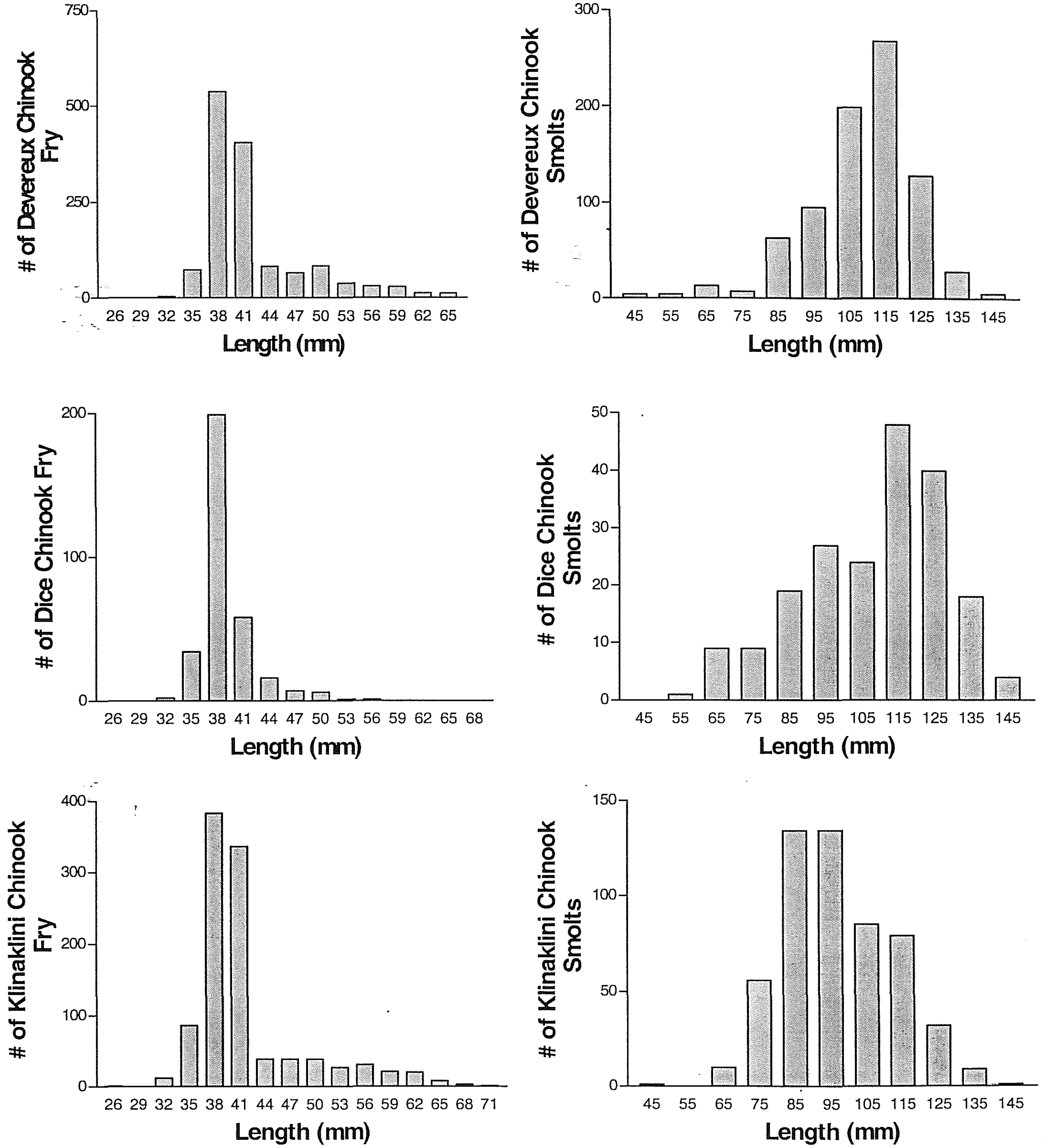

Figure 6a. Length frequency distributions for chinook sampled at each trap site, 2001.

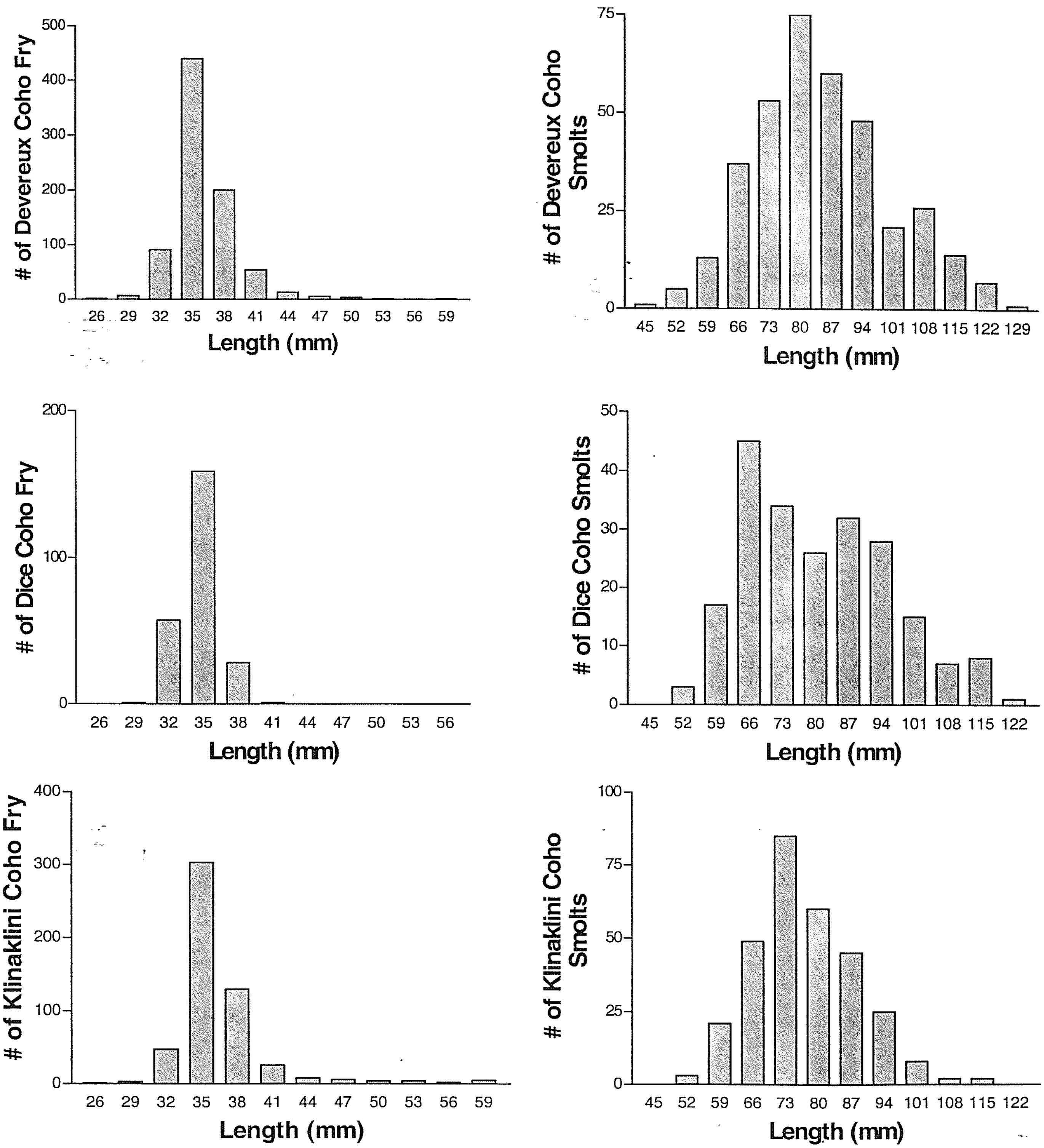

Figure 6b. Length frequency distributions for coho sampled at each trap site, 2001.

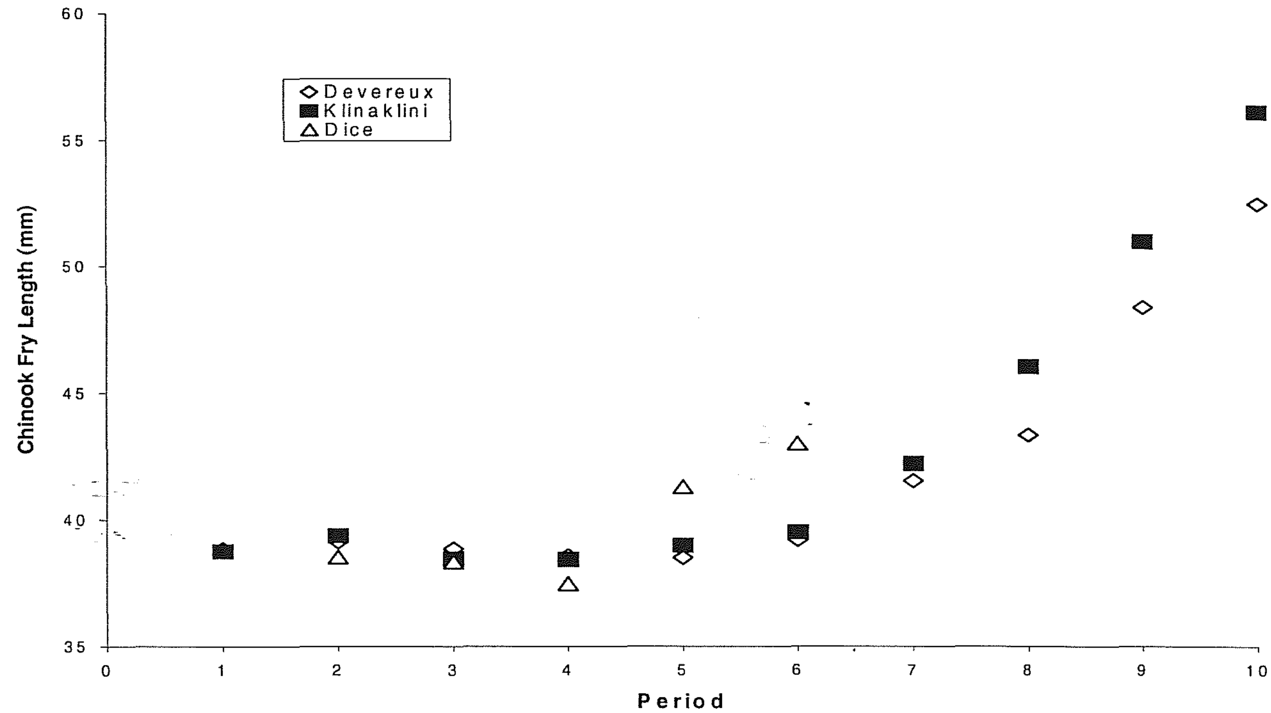

Figure 7a. Average chinook fry length, by time period, for each trap site, 2001.

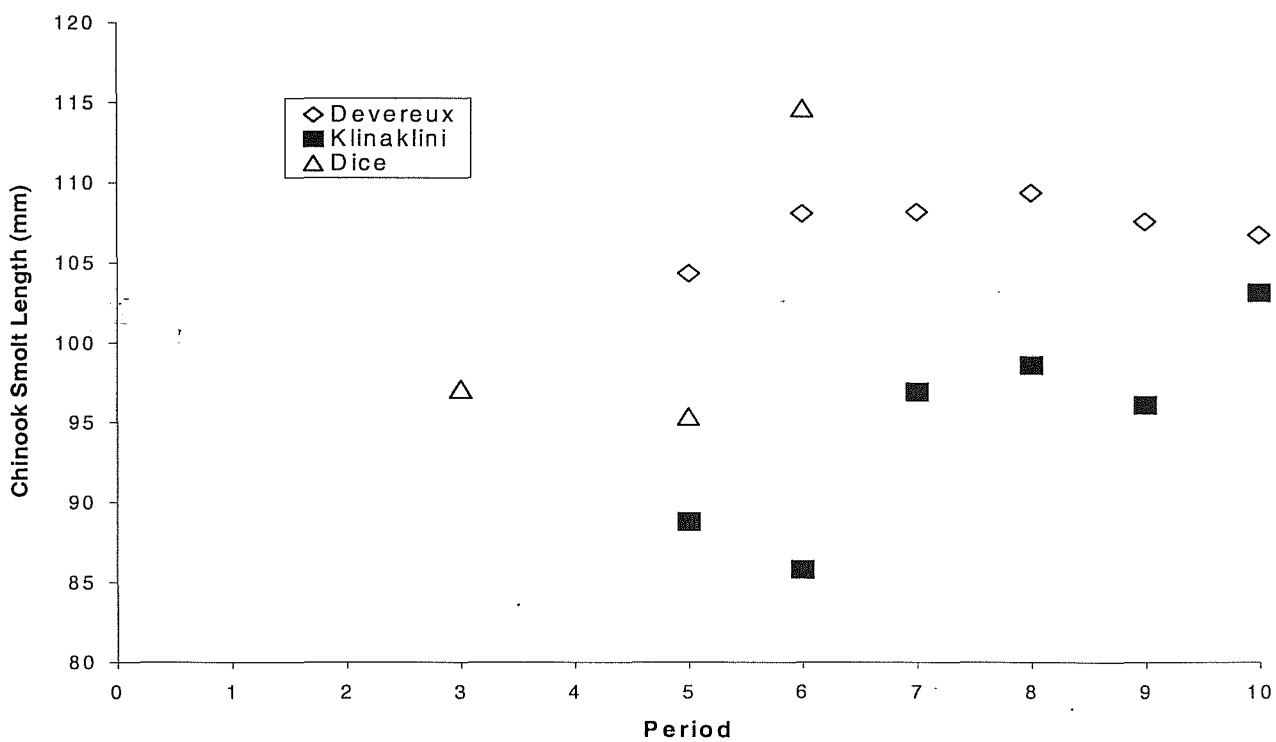

Figure 7b. Average chinook smolt length, by time period, for each trap site, 2001.

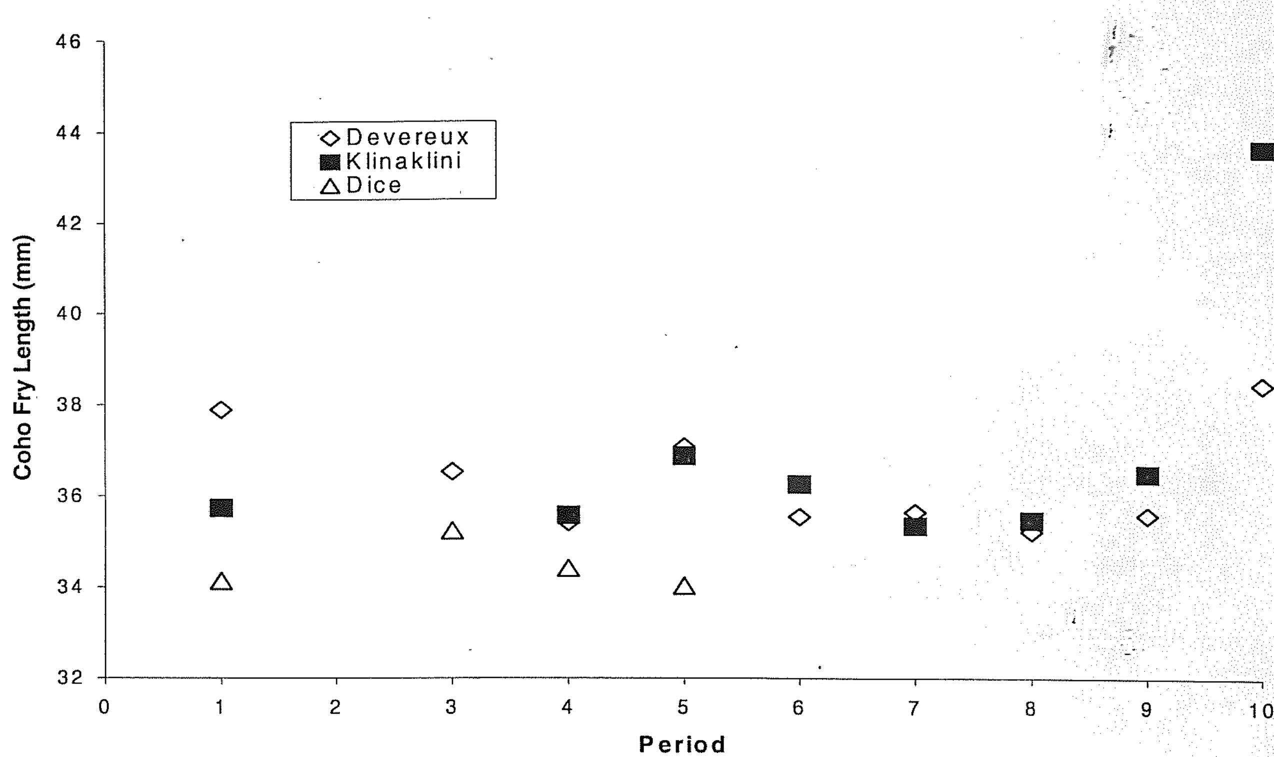

Figure 7c. Average coho fry length, by time period, for each trap site, 2001.

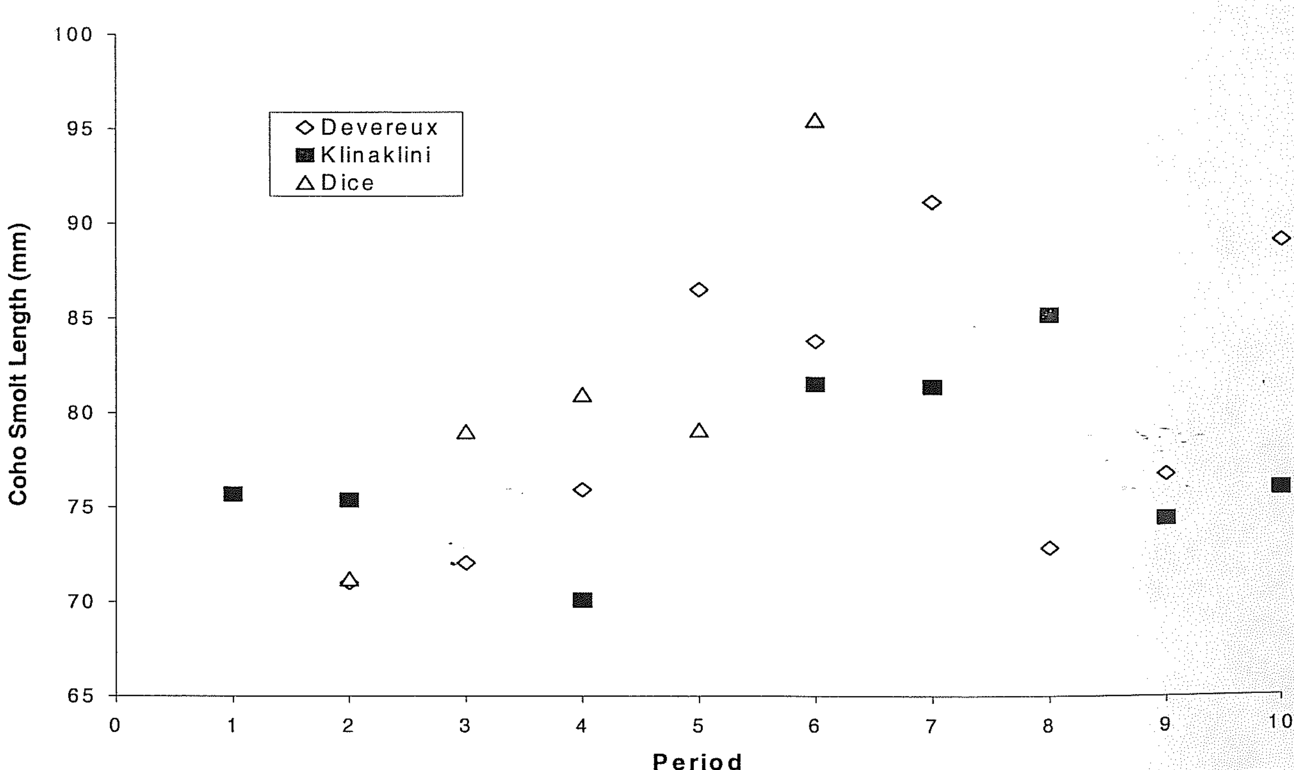

Figure 7d. Average coho smolt length, by time period, for each trap site, 2001.

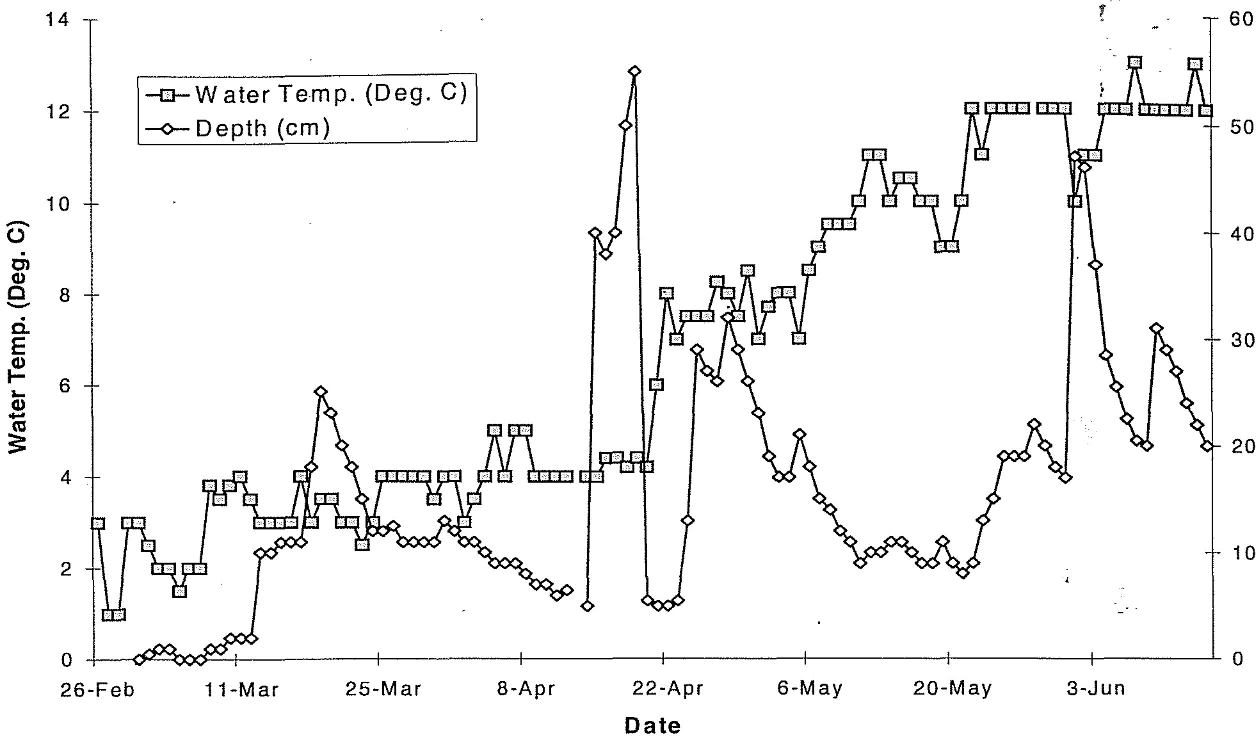

Figure 8a. Daily water temperature and depth at the Devereux Creek trap site, 2001.

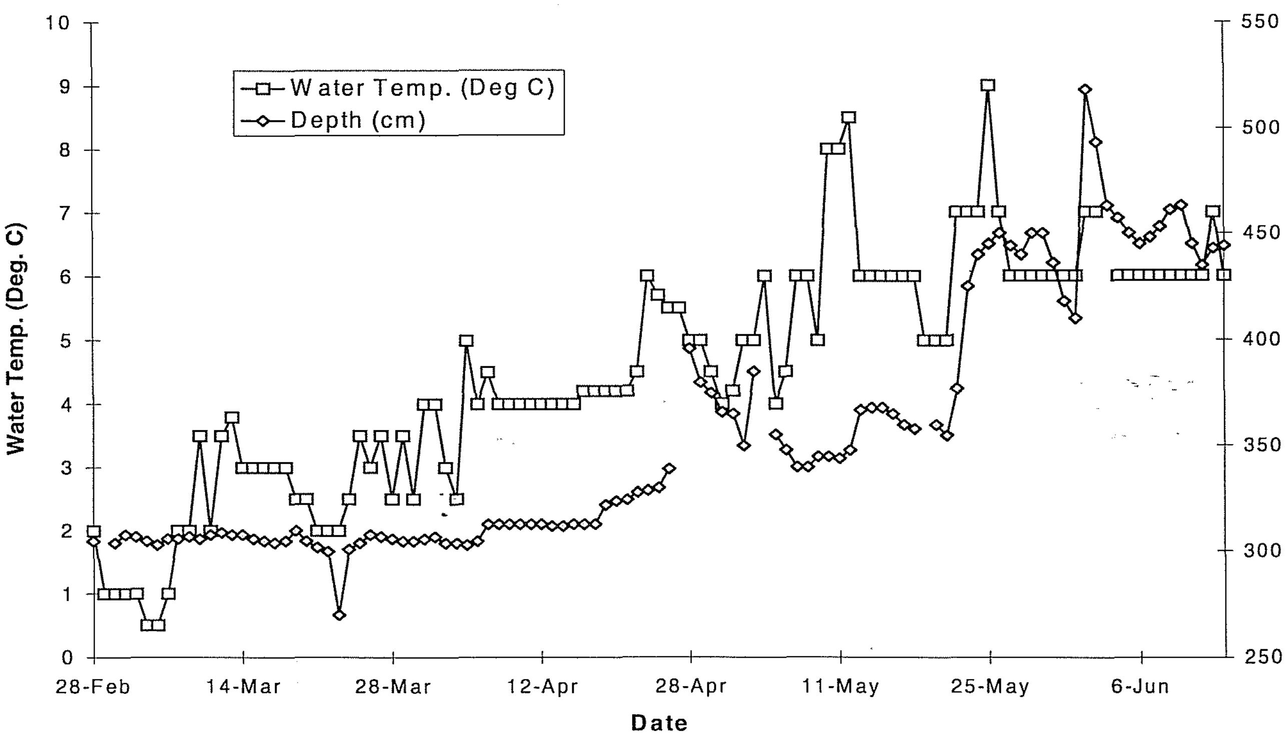

Figure 8b. Daily water temperature and depth at the Klinaklini River trap site, 2001.

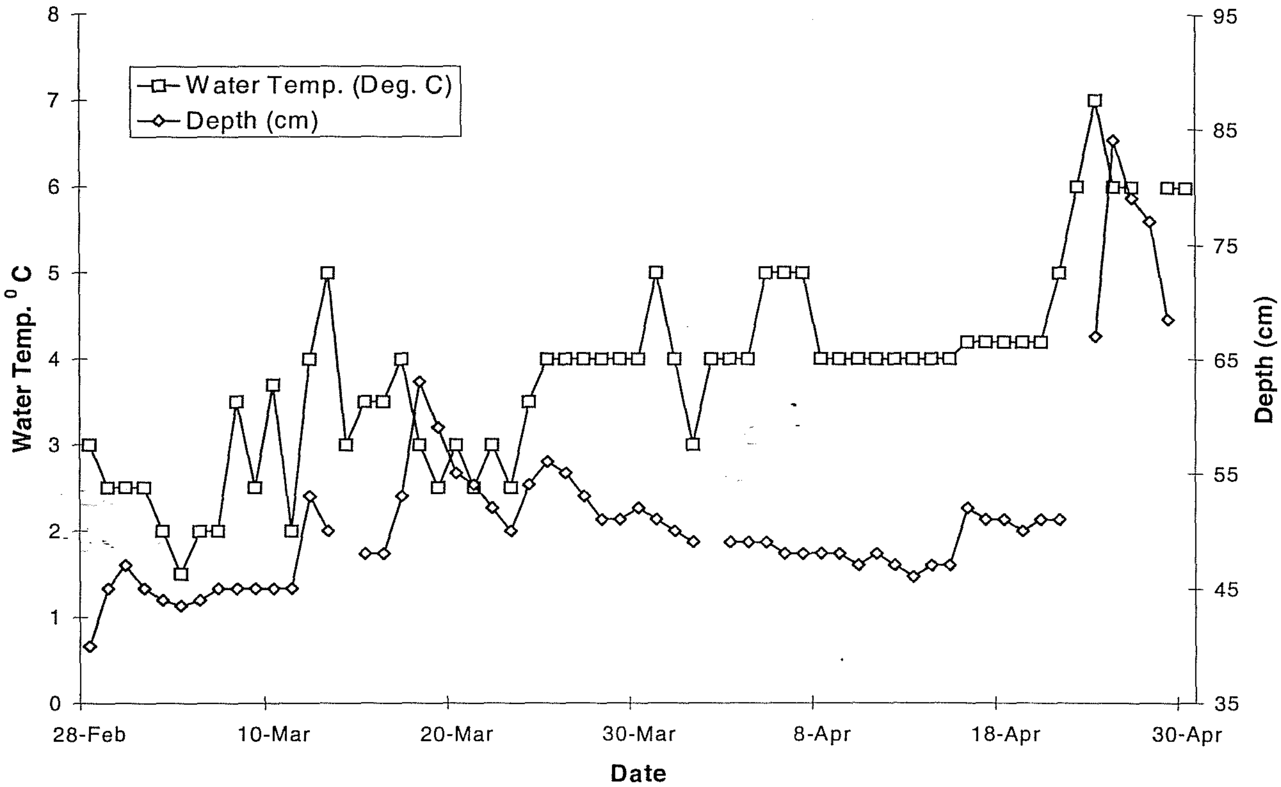

Figure 8c. Daily water temperature and depth at the Dice Creek trap site, 2001.