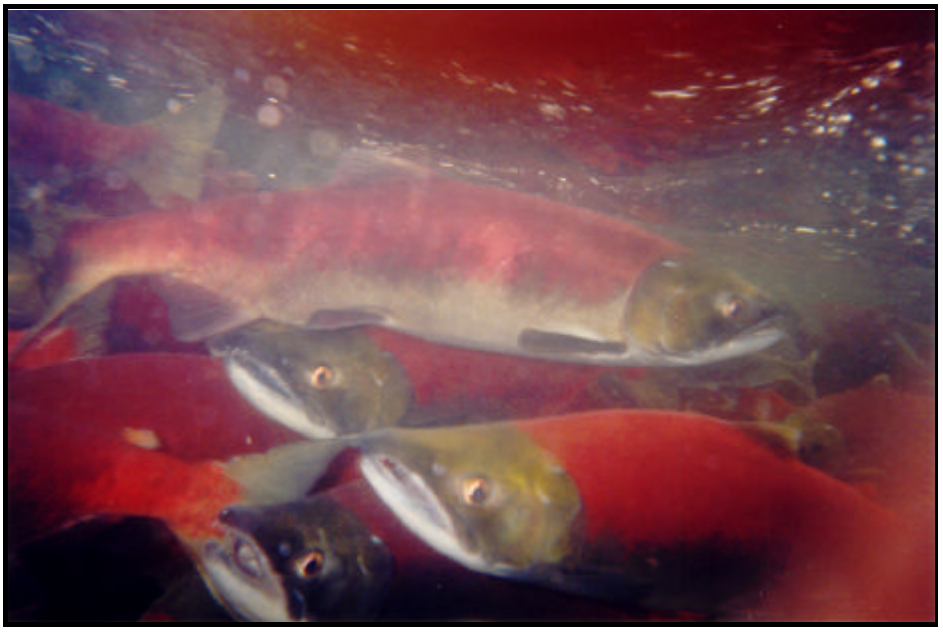
# *Okanagan River Sockeye Spawner Enumeration and Biological Sampling 2004*



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*Letter of transmittal*

# EXECUTIVE SUMMARY

Sockeye migrated to the spawning grounds from their holding in Osoyoos Lake early this year with the first fish counted on September 4th. Counts from Wells Dam indicated that this year would be a larger than normal run with 77,349 passing the Dam's ladder. The peak counts of live and dead sockeye in the index section (Reaches 1 through 3) is 21, 049. This count occurred on October 7th 2004. However the date when 10% of the count run is dead which is considered the time when the peak of the run has been passed didn't occur until October 16th. The peak counts of live and dead kokanee also occurred October 7th with 485 kokanee counted. There were also a total of 16 chinook counted this year. An average of 3026 sockeye redds were counted.

A peak count of 374 live and dead sockeye were found in the VDS section (Reach 4) on October 29th. The peak count of kokanee were also on October 29th with 273 counted. During the early part of sockeye migration the McIntyre Dam was opened to release flows of 30cms. Two counts (September 4th and October 7th) were completed to see if sockeye were trying to spawn above the dam. We conducted walking counts at VDS 14 through 17 by similar methods to the count at VDS's downstream. No sockeye were seen at these times.

A total number of 531 sockeye were sampled this year for length, weight, age (otilith and scales), and fecundity of 57 green females. Six chinook and two rainbow trout were sampled by non-lethal methods to measure nose-fork length and collect a DNA sample from the operculum. Of the 291 male sockeye sampled, 96.2% were 4-years-old (4-2 Gilbert-Rich) and had average lengths of 50.8cm. Of the 240 females 94.6% were 4-year-old with an average lengths of 49.9cm. The average fecundity of sockeye this year is 3234, which is larger by comparison to last years 2,256 for 4-2 age fish.

A number of methods were used this year to estimate the ratio of male to female sockeye and determine the best method for future years. Of the three methods, gillnetting, beach seining and dead counts by walking the index section we found varied ratios. Ratio of male to females for gillnetting was 1 : 0.46, and similarly for beach seining a ratio of 1**:** 0.66 was found. These methods are known to favour the capture of males. In contrast the ratio from the single dead count was 1 **:** 1.3 in favour of females. It is recommended that a series of dead counts by stream walks be conducted in future years to estimate the sex ratio.

# ACKNOWLEDGEMENTS

The Okanagan Nation Alliance – Fisheries Department (ONAFD) would like to thank the following people for their continued support.

Douglas County PUD, provided the financing for the majority of this project as part of the Fish-Water Management Tools (FWMT) project. Thanks to Dr. Kim Hyatt, Paul Rankin and Margot Stockwell of Fisheries and Oceans Canada for the continuous help with our bio-sampling plan and procedures. Cindy Harlow of Fisheries and Oceans Canada helped the field crew with the bio-sampling along with Garth Traxler and Jon Richard from the Pacific Biological Station.

Deer Park Estates and Blake Kennedy allowed us access to the river across their properties during the float season along with the Osoyoos Indian Band.



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# 1.0 INTRODUCTION

## *1.1 Background*

This is the 6th year the Okanagan Nation Alliance Fisheries Department has enumerated and colleted biological samples of spawning Okanagan sockeye. These fish have migrated the Columbia River with its nine dams at which they have been counted at Wells Dam before moving into the Okanagan system in the summer. Okanagan sockeye hold in Osoyoos Lake before their final migration up the Canadian portion of the Okanagan River below McIntyre Dam to spawn.

## *1.2 Objectives*

The objectives of this years study like past years is to:

1. Complete standardized counts of sockeye, kokanee and chinook.
2. Determine peak spawning dates and egg deposition timing.
3. Determine the distribution of sockeye spawners through the river (4 reaches).
4. Biological sampling (age, sex, fecundity, length and weight).
5. Ratio of male to female sockeye.

## *1.3 Study area*

The Okanagan River drainage basin has been channelized and controlled with three mainstem dams. The river is split into two standardized sections the index and VDS (Vertical Drop Structure) sections. Within the index section there are three reaches starting with the uppermost limit to fish migration, McIntyre Dam to the Highway 97 Bridge crossing (Reach 1). Reach 2 extends from the bridge crossing to VDS 13 and finally Reach 3 runs from VDS13 to the Oliver Bridge crossing (or VDS12). Reach 4 otherwise noted as the VDS section extends from the Oliver Bridge crossing to Osoyoos Lake, within which 11 VDS are found.

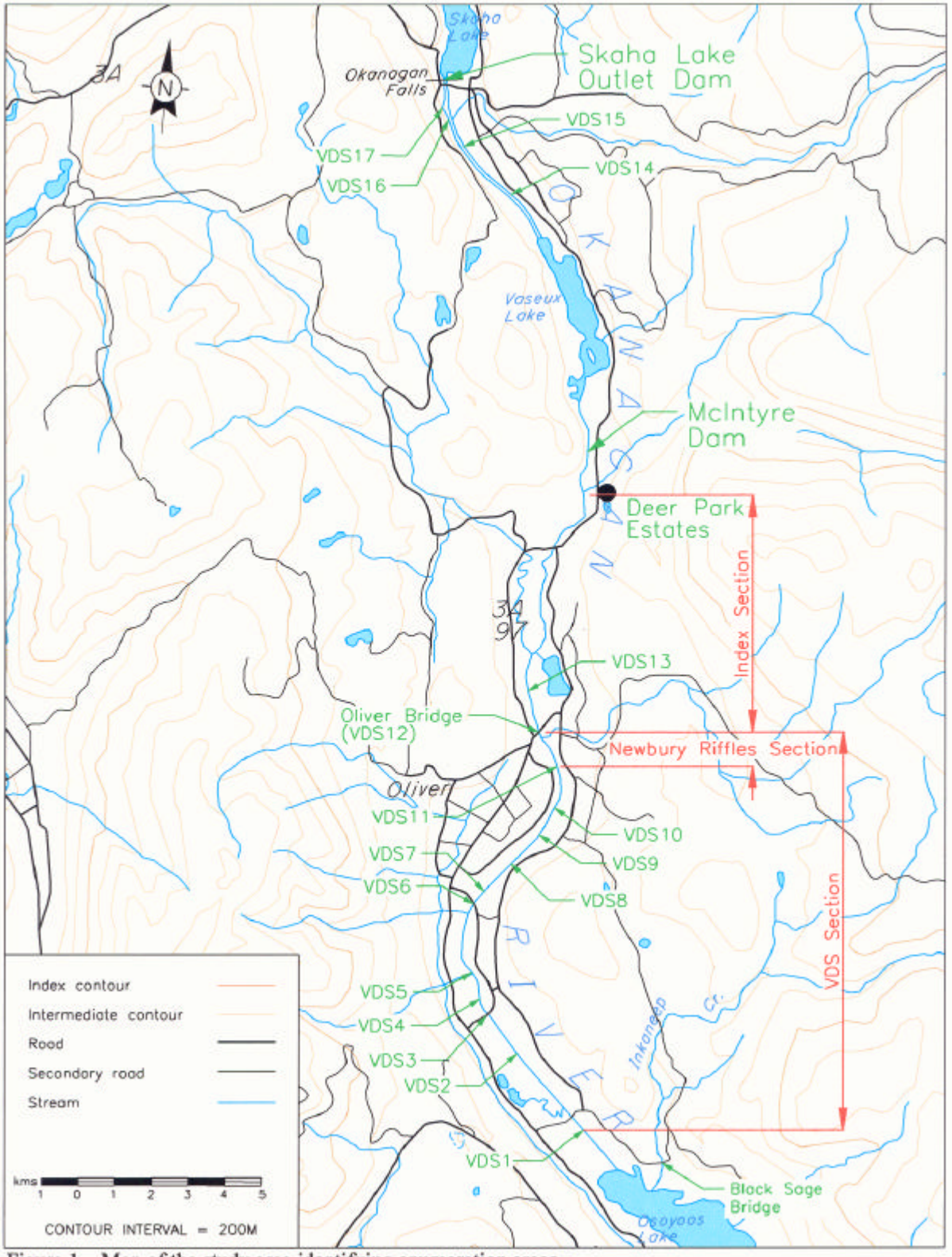


Figure 1. Map of the study area identifying enumeration areas.

# 2.0 METHODS

### *2.1 Salmon enumerations*

Sockeye enumerations began September 14th, 2004 and ran until November 3rd, 2004, occurring weekly during the early part of the run. Counts during the peak of the run were increased in frequency to every 3 days. The enumeration method was standardized in 2000. A summary of this method is tabled below (Table 1; Alexis & Wright 2004).

Table 1. Summary of enumeration methods for each section

| Section | Reach | Method | Start location | End location |
|---|---|---|---|---|
| Index section | 1a | Walk along the left bank downstream | McIntyre Dam | Deer Park Estates |
| Index section | 1b | 3 person crew, one boat float walking side channels | Deer Park Estates | Highway 97 Bridge crossing |
| Index section | 2 | 3 person crew, one boat float walking side channels | Highway 97 Bridge crossing | VDS 13 |
| Index section | 3 | 3 person crew, one boat float walking side channels | VDS 13 | Oliver Bridge Crossing (VDS12) |
| VDS section | 4 riffles | Walk along the left bank downstream | Oliver Bridge Crossing (VDS12) | Last of the 4 Newbury riffles |
| VDS section | 4 | Counts conducted by viewing upstream from the 11 separate VDS | VDS11 | VDS1 |

Although the methods of counting differ, they are typically completed on the same day with index count occurring in the morning and VDS section counts completed in the afternoon of the same day. Counts include live sockeye, dead sockeye and sockeye redds as well as numbers of live and dead kokanee and chinook. Each of the four reaches were recorded on separate stream inspection log forms (BC16 forms).

The quality of each count was also recorded at the time the enumeration occurred for both the index and VDS counts. Information collected to determine the quality of the counts include,

- fish visibility (recorded as high, medium and low)
- water clarity (water depth of visibility),
- weather (cloud cover, brightness, precipitation),
- and water temperature.

### 2.1.1 Index section enumerations

Reach 1a in the index section is completed by stream-side walks from McIntyre Dam to Deer Park Estates along the left bank (looking downstream). Although little spawning occurs in this reach the walks were added to determine if fish were attempting to migrate the usually impassable dam. Sockeye between Deer Park Estates to the end of Reach 1 at the Highway Bridge crossing (Reach 1b) are enumerated by a crew of three in a zodiac boat. In addition to floating the river, the side channels were walked. Each crew member was supplied with polarized glasses, ball cap or visor, PFD (personal floatation device), and several "tally" counters. Reaches 2 and 3 are enumerated similarly by the three person crew zodiac float.

### 2.1.2 VDS section enumeration

Enumeration in the VDS section consisted of a single observer walking along the top of the VDS from the left to right bank across the river. While walking slowly the observer counts as far upstream of the drop structure as visible (generally 50m). All fish observations were made from the top of the drop structures whereas the Newbury riffles located at the top of this reach were walked along left the stream-bank to enumerate salmon.

## *2.2 Biological sampling of sockeye*

Our goal was to collect biological samples from 1% of this years sockeye run. Since 77,349 sockeye were counted passing Wells Dam in 2004 and 50% of this number was expected on the spawning grounds (38,674 sockeye) therefore 1% of this expected total is 387. To reach this target number the ONAFD took biological samples from 133 sockeye harvested in Osoyoos Lake for sustenance and ceremonial purposes and 514 sockeye were sampled from the ONAFD broodstock collections.

The 133 sockeye caught in Osoyoos Lake were gillnetted while holding in August and September before moving up Okanagan River to spawn. Gillnets were set near the mouth of Okanagan River. There was generally 4 to 8 standard sized of gangs set with mesh sizes ranging from 2.0 inch to 5.0 inches. Sets were started in the evening and left overnight from typically 8pm to 10am except for an experimental day set on August 24$^{th}$. Details of gillnetting data available in Appendix E and bio-sampling data is found in Appendix D.

As part of the broodstock collections 514 sockeye were bio-sampled. These fish were caught by beach seining the fish on the spawning grounds in Okanagan River. Three different beach seine sizes were used to catch broodstock. The dimensions of these are found in Table 2. Typically the two 60m (200 foot) long nets were used except when the smaller river side channels were seined, in which case the small fry net (30X 3m) was better designed.

Table 2. Beach seines used and dimensions

| *Beach seine* | *Seine length* | *Seine depth* | *Mesh sizes* |
|---|---|---|---|
| Large 2004 net | 60m (200 feet) | 4.6m (15 feet) | 22mm $^{7}/_{8}$ inch |
| Medium 2003 net | 60m (200 feet) | 1.2m (4 foot) wings,<br>3m (10 foot) bunt | 44 mm (1 ¾ in) wings<br>22mm ($^{7}/_{8}$ in) bunt |
| Small lake fry net | 30(100 feet) | 3m (10 feet) bunt<br>10m (33 feet) wings | 25mm (1 inch) wings<br>3mm ($^{1}/_{8}$ in) bunt |

Beach seining (Fig. 2 and 3) occurred throughout the river upstream of VDS13 (Fig. 1). Broodstock collections occurred from October 6th through 21st, with no sampling on the holiday Monday (Oct 11th). Okanagan River beach seining has been described in detail in Wright and Smith (2003).

Figure 2. Completing the beach seine set

Figure 3. Beaching the seine set

Data collected as part of the biological sampling program included,

- nose-fork length (cm),
- fish weight (to 0.1g),
- age (otiliths and scales if possible),
- female fecundity (85 green sockeye).

Scales were only collected on the 133 sockeye that were caught in Osoyoos Lake in August and early September as the fish had not yet fully absorbed their scales. Whereas sockeye caught in October had completely absorbed their scales and so only an otilith was taken. Female fecundity was determined by counting eggs from the skein. Non-lethal sampling of chinook and rainbow trout (steelhead) was done on those species that were by-catch as part of the beach seining for sockeye broodstock collections. The information collected from these fish includes,

- any markings or clips,
- nose-fork length,
- DNA sample by operculum hole punch.

### 2.2.1 Sockeye sex-ratio

ONAFD is still experimenting with ways to determine the most appropriate method to attain the sex-ratio of sockeye spawners. Three methods were used this year that will be compared. As part of the bio-sampling program, live fish were caught by two different methods, (1) gillnetting the sockeye holding in Osoyoos Lake and (2) beach seining the spawners on the spawning ground. In addition, a single count of dead sockeye was done by a crew of three technicians walking the banks of the index section counting dead male and female sockeye on October 22nd in the final weeks of the run. The technicians counted all sockeye morts identifying between male, female and unknown. The sex was deemed unknown sex in the event that it was either too deep to dig up the mort to verify its sex or too decomposed to determine.

# 3.0 RESULTS

## *3.1 Index section enumeration*

This year peak spawning occurred on October 7th, with peak live plus dead totalling 21,049. This date is earlier than usual where typically the middle of October is the run peak. The water temperatures this year may have been the driving force creating a run that arrived on the spawning beds early and then caused a 12 day plateau of peak counts. This plateau remained steady at around 20,000 fish which were counted from October 7th to October 19th. This system normally peaks more sharply. A summary of the index counts in found in Table 3 and Figure 4. For complete information refer to Appendix A.

Table 3. Sockeye spawner counts for the index section in 2004

| Date 2004 | Sockeye live | Sockeye dead | Sockeye redds | Chinook live | Kokanee live | Water temperature (° Celcius) | Fish Visibility |
|---|---|---|---|---|---|---|---|
| 15 Sept | 15 | 0 | 0 | 0 | 0 | 18.0 | High |
| 20 Sept | 267 | 0 | 0 | 0 | 0 | 16.0 | Low |
| 25 Sept | 1353 | 0 | 0 | 0 | 0 | 17.0 | Medium |
| 30 Sept | 5399 | 1 | 21 | 1 | 89 | 16.0 | Medium |
| 4 Oct | 12478 | 6 | 164 | 4 | 356 | 16.0 | High |
| 7 Oct | 20986 | 63 | 836 | 1 | 485 | 15.0 | High |
| 10 Oct | 19922 | 266 | 2119 | 1 | 419 | 14.5 | High |
| 13 Oct | 19005 | 669 | 2669 | 1 | 63 | 15.0 | High |
| 19 Oct | 16966 | 3410 | 2204 | 5 | 98 | 12.5 | Medium |
| 22 Oct | 14969 | 4169 | 4401 | 1 | 56 | 11.5 | Low |
| 27 Oct | 3786 | 6245 | 3869 | 2 | 18 | 9.5 | Medium |
| 3 Nov | 739 | 3397 | 2895 | 0 | 0 | 9.0 | High |

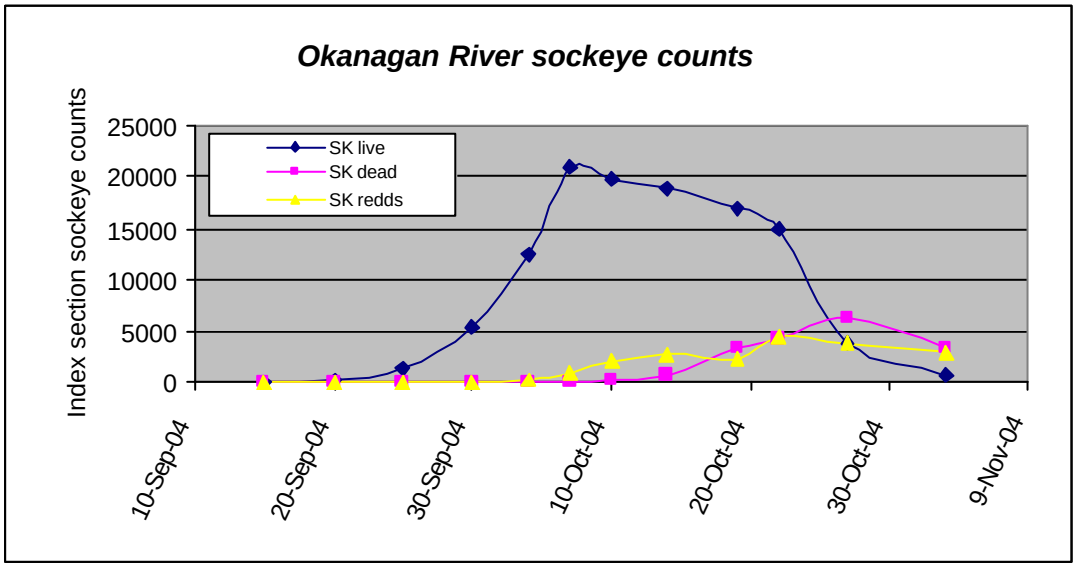


Figure 4. Okanagan River sockeye index section counts

The determination of the timing of egg deposition is important to the estimation of hatch and emergence of sockeye fry. Egg deposition timing is calculated from the cumulative totals of live plus dead counts of sockeye from the index section. By reading from Figure 5, the date when 25% of eggs were deposited occurred on October 6th. The date of 50% and 75% egg deposition occurred October 10th and 16th respectively.

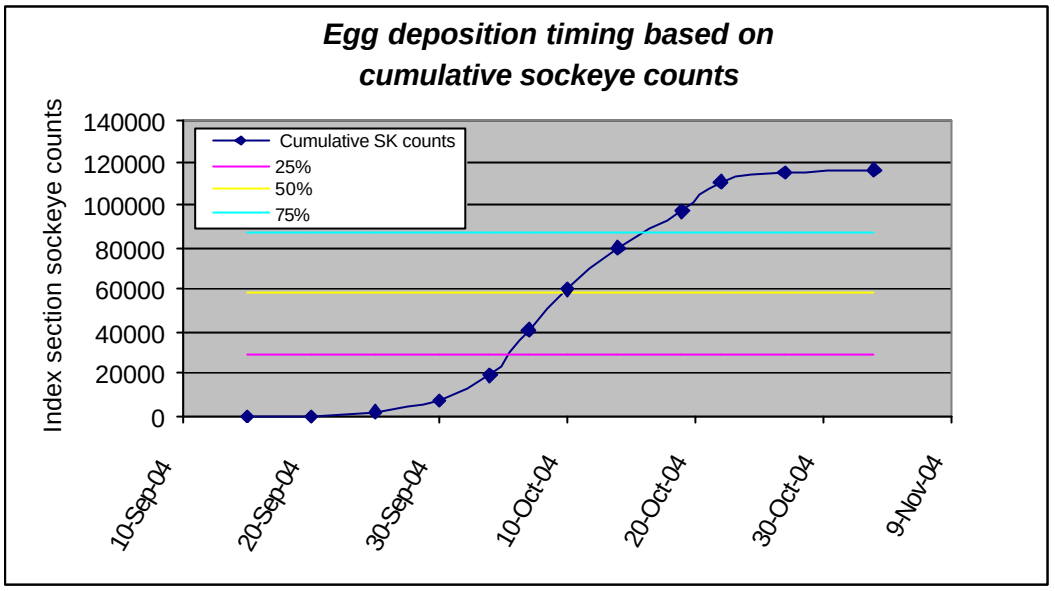


Figure 5. Egg deposition timing for sockeye in the index section

### *3.2 VDS section enumeration*

The number of sockeye live and dead plus the total number of redds counted has been summarized for the 11 Vertical drop structures and 4 Newbury riffles (Table 4). The peak number of sockeye in this section is 374 live plus dead occurring on October 29th. October 29th is also the peak count of kokanee. Detailed data and a list of other fish species counted in the VDS section are found in Appendix B.

Table 4. Summary of sockeye spawners at VDS 1 though 11 and the riffles.

| Date | Live sockeye | Dead sockeye | Sockeye redds | Live kokanee | Fish visibility |
|---|---|---|---|---|---|
| 4-Sep-04 | 136 | 0 | 0 | 122 | high |
| 15-Sep-04 | 0 | 0 | 0 | 0 | low |
| 20-Sep-04 | 36 | 0 | 0 | 19 | low-med |
| 25-Sep-04 | 84 | 0 | 0 | 9 | medium |
| 30-Sep-04 | 134 | 0 | 0 | 6 | low |
| 7-Oct-04 | 257 | 2 | 5 | 61 | high |
| 10-Oct-04 | 236 | 0 | 67 | 136 | low |
| 22-Oct-04 | 224 | 30 | 79 | 88 | low |
| 27-Oct-04 | 196 | 43 | 152 | 60 | medium |
| 29-Oct-04 | 374 | 0 | 76 | 273 | med-high |
| 2-Nov-04 | 162 | 33 | 55 | 7 | high |

### *3.3 Biological sampling*

A total number of 647sockeye were bio-sampled in 2004 among which 30% (192 fish) were from the early run, 54% (353 fish) were from the peak and 16% (103 fish) were from the late run. Timings of the runs were estimated from the index section enumerations (Section 3.1). The estimated dates of the runs are as follows,

- Early run: September 15th to October 6th
- Peak run: October 7th to October 15th
- Late run: October 16th to November 3rd.

Although otolith and scales were aged this year this information could not be linked to the length and weight measurements. The total percent by age of Okanagan male and female sockeye can be found in Table 5. Biosampling was completed on site (Fig. 6).

Table 5. Okanagan sockeye age

| Male & female age | Total count | % by age |
|---|---|---|
| 3 | 14 | 2.6% |
| 4 | 506 | 95.3% |
| 5 | 11 | 2.1% |

For male sockeye, 1.7% were 3-2 (Gilbert-Rich), 96.2% were 4-2, 1.7% were 5-2 and 0.3% were 5-3 (Table 6). For female sockeye, 3.8% were 3-2, 94.6% were 4-2, and 1.7% were 5-2. The average length of male 3-2, 4-2 and 5-2 sockeye were 47.1 cm, 50.8 cm and 53.2 cm respectively. There was one 5-3 male sockeye whose length was 53.0cm. The average length of female 3-2, 4-2, and 5-2 were 47.4cm, 49.9 cm, and 52.6 cm respectively. One rainbow trout was sampled with a length of 39mm. Six chinook were also caught in beach seines. The average length of the chinook caught is 52cm.

Table 6. Length-at-age of male and female Okanagan sockeye in 2004

| Males | Total count | % by age | Mean length (cm) | Standard Deviation | Maximum | Minimum |
|---|---|---|---|---|---|---|
| **3-2** | 5 | 1.7% | 47.1 | 4.3 | 50.0 | 39.7 |
| **4-2** | 280 | 96.2% | 50.8 | 2.3 | 57.0 | 44.5 |
| **5-2** | 5 | 1.7% | 53.2 | 3.0 | 57.0 | 50.0 |
| **5-3** | 1 | 0.3% | 53.0 | | | |
| **Females** | | | | | | |
| **3-2** | 9 | 3.8% | 47.4 | 2.6 | 50.0 | 44.0 |
| **4-2** | 227 | 94.6% | 49.9 | 2.3 | 57.5 | 44.0 |
| **5-2** | 4 | 1.7% | 52.6 | 1.1 | 53.5 | 51.0 |

Figure 6. Bio-sampling crew processing sockeye otolith

By plotting the frequency of lengths for male and female sockeye spawners, the uni-modal distribution would confirm the aging results, that the majority of spawners (95.3%) are 4 years old (Figure 7).

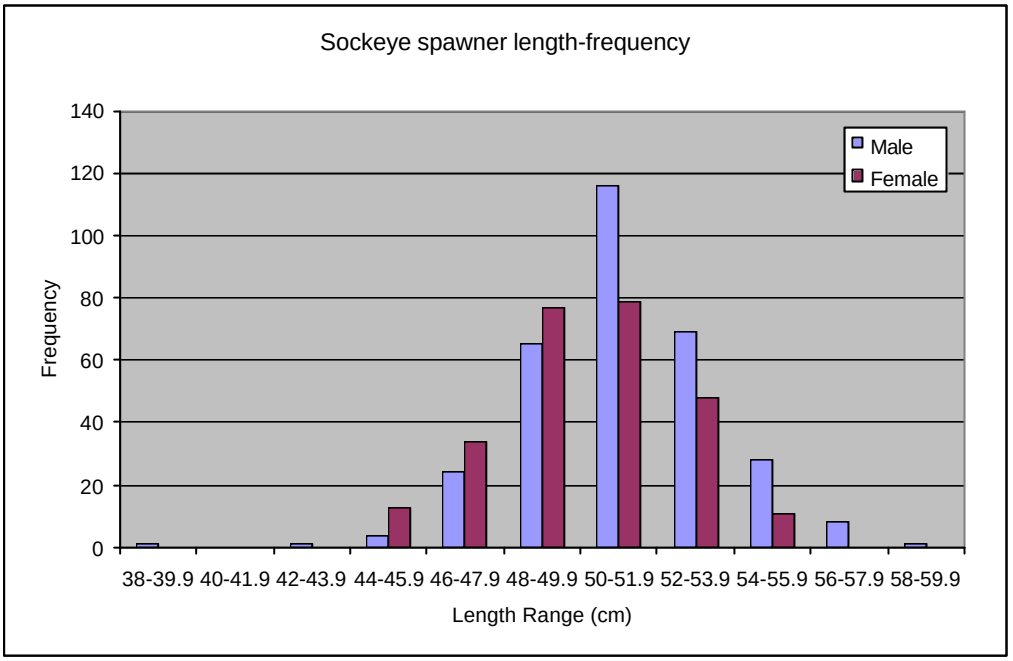


Figure 7. Length frequency of male and female sockeye spawners

### 3.3.1 Fecundity

A total of 57 green females were used to calculate the average fecundity by age (Table 7). Sample sizes for ages 3-2 and 4-2 (Gilbert-Rich) were 3 and 54 respectively. Of the 3-2 and 4-2 age females the average fecundity was 3091 and 3234 respectively.

Table 7. Fecundities by age

| Gilbert-Rich age | Mean | Standard Deviation | Count | Min. | Max. |
|---|---|---|---|---|---|
| 3.2 | 3091 | 409 | 3 | 2800 | 3558 |
| 4.2 | 3234 | 266 | 54 | 2583 | 3668 |

### 3.3.2 Sex ratio

Three methods were used where the numbers of female and male sockeye were counted to estimate the sex ratio. The three methods, gillnetting, beach seining and post-peak counts of dead sockeye are compared to provide future direction as to which method produces the most likely sex-ratio estimate (Table 7).

A total of 71 male and 33 females were caught by gillnetting sockeye in Osoyoos Lake over 9 evenings. Gillnetting favours the capture of males as they have started to develop teeth and a kype that are more likely to be tangled in the nets (although at this stage the males' teeth and kype are not fully developed). There were 0.46 females for every one male caught by gillnetting (Appendix E).

Capturing sockeye by beach seining the spawning grounds has been used for the second year now. In 2003, 0.37 females were found for every one male (73 male : 27 females). Similarly in 2004, we found that this method definitely favoured the capture of males as we caught 0.66 females for every one male over the 104 beach seines completed. This ratio is most likely due to the females' aggressively staying with their redd by nestling down within the trough to avoid capture by the nets (Appendix F).

Finally, since we felt that our capture techniques both seemed to favour catching males, we did one count of dead sockeye during the post-peak. This was completed by a crew of three walking along each side of the river and all the side channels within the index section counting every dead sockeye found as male, female or unknown. The quality of this count is felt to be fairly accurate however this accuracy would improve with the walking count repeated several times over the course of the post-peak. The dead count found 1.3 females for every one male which is vastly different from either beach seining or gillnetting (Appendix F).

Table 8. Comparison of sex ratio methods used in 2004

| Method | Dates | Number of males | Number of females | Male to Female Ratio | Comments |
|---|---|---|---|---|---|
| Gillnetting holding sockeye in Osoyoos Lake | July 14 – Sept 16 | 71 | 33 | 1 : 0.46 | Target males with teeth and developed kype |
| Beach seining spawning sockeye in Okanagan River | Oct 6–21 | 12,933 | 7044 | 1 : 0.66 | Avoid ripe females holding in the trough of built redds |
| Dead count of sockeye in Okangan River | Oct 22 | 1,540 | 2,008 | 1 : 1.30 | Number of unknowns 349 |

## 4.0 RECOMMENDATIONS

The following suggestions should help to further refine and streamline the sampling procedures in future years.

1. Enter data collected into a database system to monitor this information over the past and future years.
2. Continue to count chinook, and kokanee.
3. Recommend using a series of dead counts over the post-peak spawning period to determine the sex-ratio of sockeye.
4. Wrestle with the Wells Dam vs. spawning ground discrepancies.
5. Aging results need to be linked to the lengths and weights in future.

## 5.0 REFERENCES

Alexis, F. & R.H. Wright. 2004. Okanagan River Sockeye Spawner Enumeration and Biological Sampling 2004. Prepared by Okanagan Nation Alliance – Fisheries Department, Westbank, BC.

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# APPENDIX A

## Index section count data

| | | | ***Count quality*** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Date 2004 | Time: *start* | Time: *end* | Crew | Water Temp. | Water clarity (m) | Cloud % | Bright | Precip. | Visibility |
| 16-Jun | 9:20 | 13:23 | HW, FA, ET | 18.5 | 2.0 | 0% | full | nil | medium |
| 15-Sep | 9:50 | 12:46 | FA, KL, ET | 18.0 | 2.0 | 90% | medium | yes | high |
| 20-Sep | 9:10 | 11:48 | FA, ET, KL | 16.0 | 1.0 | 40% | medium | nil | low |
| 25-Sep | 9:22 | 12:43 | KL, FA | 17.0 | 2.0 | 2% | medium | nil | medium |
| 30-Sep | 9:30 | 13:51 | KL, ET, NP | 16.0 | 1.5 | 0% | full | nil | medium |
| 4-Oct | 9:50 | 13:16 | KL, ET, NP | 16.0 | 2.0 | 0% | full | nil | high |
| 7-Oc | 9:00 | 12:34 | KL, ET, GF | 15.0 | 2.0 | 0% | bright | nil | high |
| 10-Oct | 8:40 | 11:50 | KL, ET, GF | 14.5 | 2.0 | 0% | full | nil | high |
| 13-Oct | 8:50 | 12:03 | KL, ET, GF | 15.0 | 2.0 | 0% | full | nil | high |
| 19-Oct | 10:00 | 14:00 | KL, ET, GF | 12.5 | 1.0 | 100% | dark | yes | medium |
| 22-Oct | 9:30 | 12:30 | KL, ET, GF | 11.5 | 1.0 | 100% | dark | nil | low (windy) |
| 27-Oct | 8:45 | 12:00 | KL, ET, GF | 9.5 | 1.5 | 0% | full | nil | medium |
| 3-Nov | 9:30 | 14:05 | KL, NA, BA | 9.0 | 2.0 | 0% | full | nil | high |

| | Reach 1a: Mc Dam to Deer Park | | | | | | | Reach 1b: Deer Park to Hwy Bridge | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date 2004 | SK hold | SK spawn | SK dead | SK redds | KO live | KO dead | CH live | SK hold | SK spawn | SK dead | SK redds | KO live | KO dead | CH live |
| 16-Jun | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-Sep | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20-Sep | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-Sep | 373 | 0 | 0 | 0 | 0 | 0 | 0 | 243 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30-Sep | 429 | 0 | 0 | 0 | 0 | 0 | 0 | 553 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4-Oct | 282 | 0 | 0 | 0 | 0 | 0 | 0 | 2124 | 0 | 1 | 19 | 25 | 0 | 1 |
| 7-Oct | 687 | 132 | 0 | 44 | 0 | 0 | 0 | 4579 | 618 | 8 | 206 | 64 | 0 | 1 |
| 10-Oct | 861 | 189 | 0 | 63 | 6 | 0 | 0 | 2918 | 1083 | 7 | 361 | 29 | 0 | 1 |
| 13-Oct | 527 | 438 | 0 | 146 | 3 | 0 | 0 | 3190 | 1272 | 24 | 424 | 58 | 0 | 1 |
| 19-Oct | 150 | 423 | 54 | 141 | 0 | 0 | 0 | 671 | 2475 | 373 | 825 | 18 | 2 | 4 |
| 22-Oct | 0 | 377 | 25 | 168 | 0 | 0 | 0 | 0 | 2142 | 540 | 655 | 2 | 1 | 0 |
| 27-Oct | 0 | 129 | 36 | 122 | 0 | 0 | 0 | 0 | 559 | 624 | 444 | 10 | 2 | 1 |
| 3-Nov | 0 | 17 | 20 | 100 | 0 | 0 | 0 | 0 | 136 | 546 | 500 | 0 | 0 | 0 |

| | Reach 2: Hwy Bridge to VDS 13 | | | | | | | Reach 3: VDS 13 to Olvier Bridge | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | SK hold | SK spawn | SK dead | SK redds | KO live | KO dead | CH live | SK hold | SK spawn | SK dead | SK redds | KO live | KO dead | CH live |
| 16-Jun | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-Sep | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20-Sep | 236 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-Sep | 622 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30-Sep | 4042 | 0 | 0 | 21 | 89 | 0 | 1 | 375 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4-Oct | 9210 | 0 | 2 | 142 | 247 | 0 | 3 | 862 | 0 | 3 | 3 | 84 | 0 | 0 |
| 7-Oct | 12242 | 1578 | 31 | 526 | 361 | 0 | 0 | 970 | 180 | 24 | 60 | 60 | 5 | 0 |
| 10-Oct | 7973 | 4614 | 73 | 1538 | 221 | 1 | 0 | 1813 | 471 | 186 | 157 | 163 | 0 | 0 |
| 13-Oct | 6088 | 5829 | 293 | 1943 | 0 | 5 | 0 | 468 | 1193 | 352 | 156 | 2 | 57 | 0 |
| 19-Oct | 3339 | 8284 | 1638 | 1113 | 70 | 7 | 1 | 0 | 1624 | 1345 | 125 | 10 | 30 | 0 |
| 22-Oct | 0 | 8371 | 2376 | 3428 | 24 | 2 | 1 | 0 | 4079 | 1228 | 150 | 30 | 0 | 0 |
| 27-Oct | 0 | 2807 | 4476 | 3149 | 6 | 2 | 1 | 0 | 291 | 1109 | 154 | 2 | 2 | 0 |
| 3-Nov | 0 | 549 | 1322 | 2130 | 0 | 0 | 0 | 0 | 37 | 1509 | 165 | 0 | 0 | 0 |

# APPENDIX B
# VDS section count data

| Date | 4-Sep-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/ Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, NP | Riffles | 0 | 0 | 0 | 0 | 0 | 0 | |
| Time: *start* | 15:15 | VDS11 | 29 | 0 | 0 | 0 | 18 | 0 | |
| Time: *end* | 17:55 | VDS10 | 3 | 0 | 0 | 0 | 31 | 0 | |
| Water clarity (m) | 2.0 | VDS9 | 2 | 0 | 0 | 0 | 0 | 0 | |
| Cloud % | 0% | VDS8 | 34 | 0 | 0 | 0 | 5 | 0 | |
| Brightness | full | VDS7 | 20 | 0 | 0 | 0 | 28 | 0 | |
| Precipitation | nil | VDS6 | 10 | 0 | 0 | 0 | 20 | 0 | |
| Fish Visibility | high | VDS5 | 3 | 0 | 0 | 0 | 1 | 0 | |
| | | VDS4 | 4 | 0 | 0 | 0 | 8 | 0 | |
| | | VDS3 | 16 | 0 | 0 | 0 | 7 | 0 | |
| | | VDS2 | 14 | 0 | 0 | 0 | 4 | 0 | |
| | | VDS1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS17 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS16 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS15 | - | - | - | - | - | - | no access |
| | | VDS14 | 0 | 0 | 0 | 0 | 0 | 0 | |

| Date | 15-Sep-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | FA, ET, KL | Riffles | 0 | 0 | 0 | 0 | 0 | 0 | |
| Time: *start* | 15:15 | VDS11 | 0 | 0 | 0 | 0 | 0 | 0 | 1WF |
| Time: *end* | 15:50 | VDS10 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Water clarity (m) | 2.0 | VDS9 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cloud % | 90% | VDS8 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Brightness | bright | VDS7 | 0 | 0 | 0 | 0 | 0 | 0 | 1CP |
| Precipitation | showers | VDS6 | 0 | 0 | 0 | 0 | 0 | 0 | 1WF, 1LMB |
| Fish Visibility | low (wind) | VDS5 | 0 | 0 | 0 | 0 | 0 | 0 | 2LMB, 2RBT |
| | | VDS4 | 0 | 0 | 0 | 0 | 0 | 0 | 1LMB |
| | | VDS3 | 0 | 0 | 0 | 0 | 1 | 0 | 2SU |
| | | VDS2 | 0 | 0 | 0 | 0 | 0 | 0 | 1WF, 1SU |
| | | VDS1 | 0 | 0 | 0 | 0 | 0 | 0 | 1CP |

| Date | 20-Sep-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | KL | Riffles | 0 | 0 | 0 | 0 | 0 | 0 | |
| Time: *start* | 13:40 | VDS11 | 13 | 0 | 0 | 0 | 0 | 0 | |
| Time: *end* | 15:00 | VDS10 | 8 | 0 | 0 | 0 | 7 | 0 | |
| Water clarity (m) | <1.0 | VDS9 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cloud % | 60% | VDS8 | 5 | 0 | 0 | 0 | 4 | 0 | |
| Brightness | medium | VDS7 | 10 | 0 | 0 | 0 | 8 | 0 | |
| Precipitation | nil | VDS6 | 0 | 0 | 0 | 0 | 0 | 0 | 2 CP |
| Fish Visibility | low-medium | VDS5 | - | - | - | - | - | - | no access key |
| | | VDS4 | - | - | - | - | - | - | no access key |
| | | VDS3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 WF |
| | | VDS2 | - | - | - | - | - | - | no access key |
| | | VDS1 | 0 | 0 | 0 | 0 | 0 | 0 | |

| Date | 25-Sep-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET | Newbury riffle | 0 | 0 | 0 | 0 | 0 | 0 | |
| Time: *start* | 14:15 | VDS11 | 15 | 0 | 0 | 0 | 0 | 0 | |
| Time: *end* | 15:15 | VDS10 | 21 | 0 | 0 | 0 | 8 | 0 | |
| Water clarity (m) | 2.0 | VDS9 | 7 | 0 | 0 | 0 | 0 | 0 | |
| Cloud % | 2% | VDS8 | 13 | 0 | 0 | 0 | 1 | 0 | |
| Brightness | medium | VDS7 | 7 | 0 | 0 | 0 | 0 | 0 | 3 SU |
| Precipitation | nil | VDS6 | 7 | 0 | 0 | 0 | 0 | 0 | 1 SU |
| Fish Visibility | medium | VDS5 | 2 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS4 | 2 | 0 | 0 | 0 | 0 | 0 | 5 CP |
| | | VDS3 | 0 | 0 | 0 | 0 | 0 | 0 | 5CP, 1NSC |
| | | VDS2 | 10 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS1 | 0 | 0 | 0 | 0 | 0 | 0 | |

| Date | 30-Sep-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, NP | Riffles | 0 | 0 | 0 | 0 | 0 | 0 | |
| Time: *start* | 14:15 | VDS11 | 4 | 0 | 0 | 0 | 0 | 0 | |
| Time: *end* | 15:15 | VDS10 | 8 | 0 | 0 | 0 | 0 | 0 | |
| Water clarity (m) | 1.0 | VDS9 | 6 | 0 | 0 | 0 | 0 | 0 | shadow effecting visibility |
| Cloud % | 5% | VDS8 | 12 | 0 | 0 | 0 | 0 | 0 | |
| Brightness | full | VDS7 | 17 | 0 | 0 | 0 | 6 | 0 | |
| Precipitation | nil | VDS6 | 20 | 0 | 0 | 0 | 0 | 0 | shadow effecting visibility |
| Fish Visibility | low (wind) | VDS5 | 11 | 0 | 0 | 0 | 0 | 0 | 4CP, 1WF, 2LMB, 1SU |
| | | VDS4 | 12 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS3 | 36 | 0 | 0 | 0 | 0 | 0 | 2CP, 4WF |
| | | VDS2 | 6 | 0 | 0 | 0 | 0 | 0 | 1CP, 4NSC, 4WF |
| | | VDS1 | 2 | 0 | 0 | 0 | 0 | 0 | |

| Date | 7-Oct-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, GF | Riffles | 12 | 0 | 1 | 0 | 0 | 0 | 2LMB |
| Time: *start* | 14:15 | VDS11 | 51 | 0 | 0 | 0 | 3 | 0 | |
| Time: *end* | 15:15 | VDS10 | 23 | 0 | 0 | 0 | 0 | 0 | |
| Water clarity (m) | 2.0 | VDS9 | 4 | 0 | 0 | 0 | 0 | 0 | |
| Cloud % | 40% | VDS8 | 40 | 3 | 0 | 1 | 2 | 0 | SU |
| Brightness | full | VDS7 | 36 | 2 | 0 | 1 | 40 | 0 | SU |
| Precipitation | nil | VDS6 | 46 | 2 | 0 | 1 | 8 | 0 | |
| Fish Visibility | high | VDS5 | 2 | 0 | 0 | 0 | 0 | 0 | 3CP, LMB |
| | | VDS4 | 5 | 0 | 0 | 0 | 1 | 0 | |
| | | VDS3 | 17 | 6 | 0 | 2 | 3 | 0 | 1CP |
| | | VDS2 | 8 | 0 | 0 | 0 | 0 | 0 | 3LMB, 1WF |
| | | VDS1 | 0 | 0 | 1 | 0 | 4 | 0 | 1SU |
| | | VDS17 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS16 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS15 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS14 | 0 | 0 | 0 | 0 | 0 | 0 | |

| Date | 10-Oct-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, GF | Newbury riffle | 0 | 0 | 0 | 0 | 0 | 0 | very poor visiblilty |
| Time: *start* | 14:50 | VDS11 | 26 | 16 | 0 | 6 | 12 | 0 | 1CP |
| Time: *end* | 15:50 | VDS10 | 40 | 8 | 0 | 3 | 21 | 0 | |
| Water clarity (m) | 1.5 | VDS9 | 3 | 0 | 0 | 0 | 0 | 0 | |
| Cloud % | 40% | VDS8 | 0 | 14 | 0 | 10 | 3 | 0 | |
| Brightness | medium | VDS7 | 0 | 25 | 0 | 12 | 51 | 0 | |
| Precipitation | nil | VDS6 | 20 | 12 | 0 | 4 | 18 | 0 | 2 CP, 1LMB, 2WF |
| Fish Visibility | low | VDS5 | 0 | 10 | 0 | 6 | 4 | 0 | 2LMB/ 1 SU |
| | | VDS4 | 0 | 3 | 0 | 4 | 4 | 0 | |
| | | VDS3 | 30 | 15 | 0 | 5 | 17 | 0 | 1WF |
| | | VDS2 | 0 | 9 | 0 | 8 | 2 | 0 | 3SU |
| | | VDS1 | 0 | 5 | 0 | 9 | 4 | 0 | 2SU |

| Date | 22-Oct-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, GF | Riffles | 13 | 8 | 15 | 6 | 3 | 0 | 1SU, 1CP |
| Time: *start* | 14:27 | VDS11 | 3 | 9 | 0 | 7 | 0 | 0 | |
| Time: *end* | 15:21 | VDS10 | 0 | 15 | 7 | 6 | 4 | 0 | |
| Water clarity (m) | 1.0 | VDS9 | 0 | 9 | 0 | 5 | 0 | 0 | |
| Cloud % | 85% | VDS8 | 11 | 6 | 0 | 7 | 14 | 0 | |
| Brightness | medium | VDS7 | 0 | 45 | 0 | 20 | 26 | 0 | 3 CP, 2WF |
| Precipitation | nil | VDS6 | 17 | 30 | 2 | 15 | 18 | 0 | 1CP |
| Fish Visibility | low | VDS5 | 0 | 0 | 4 | 2 | 0 | 0 | |
| | | VDS4 | 5 | 0 | 0 | 0 | 0 | 1 | |
| | | VDS3 | 20 | 11 | 0 | 5 | 8 | 0 | |
| | | VDS2 | 21 | 0 | 2 | 6 | 13 | 0 | 1 SU |
| | | VDS1 | 1 | 0 | 0 | 0 | 2 | 0 | visibility poor |

| Date | 27-Oct-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, GF | Riffles | 0 | 35 | 16 | 10 | 2 | 0 | 2SU |
| Time: *start* | 14:00 | VDS11 | 1 | 0 | 1 | 6 | 0 | 0 | |
| Time: *end* | 15:10 | VDS10 | 0 | 13 | 7 | 6 | 0 | 0 | |
| Water clarity (m) | 1.5 | VDS9 | 0 | 5 | 1 | 4 | 0 | 1 | |
| Cloud % | 0 | VDS8 | 0 | 7 | 1 | 8 | 0 | 2 | |
| Brightness | full | VDS7 | 0 | 19 | 1 | 15 | 0 | 0 | 2CP |
| Precipitation | nil | VDS6 | 6 | 52 | 1 | 24 | 0 | 0 | |
| Fish Visibility | medium | VDS5 | 0 | 10 | 9 | 6 | 5 | 0 | 1LMB, 1SU |
| | | VDS4 | 7 | 2 | 1 | 12 | 7 | 0 | |
| | | VDS3 | 18 | 12 | 5 | 50 | 43 | 0 | 1CP, 1SU |
| | | VDS2 | 0 | 7 | 0 | 7 | 2 | 0 | |
| | | VDS1 | 0 | 2 | 0 | 4 | 1 | 0 | |

| Date | 29-Oct-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | ET, GF | Riffles | 44 | 0 | 0 | 0 | 17 | 0 | 1CP, 2SU |
| Time: *start* | 13:00 | VDS11 | 18 | 11 | 0 | 17 | 12 | 0 | 1SU |
| Time: *end* | 14:17 | VDS10 | 18 | 5 | 0 | 3 | 27 | 0 | 1SU |
| Water clarity (m) | 2 | VDS9 | 4 | 14 | 0 | 4 | 4 | 0 | 1WF |
| Cloud % | 0 | VDS8 | 0 | 12 | 0 | 7 | 22 | 0 | 1CP, 1SU |
| Brightness | full | VDS7 | 34 | 17 | 0 | 12 | 38 | 0 | 4SU |
| Precipitation | nil | VDS6 | 87 | 5 | 0 | 3 | 79 | 0 | 5CP, 2LMB, 1WF |
| Fish Visibility | Med-high | VDS5 | 1 | 0 | 0 | 3 | 9 | 0 | 3CP |
| | | VDS4 | 3 | 4 | 0 | 5 | 2 | 0 | 1CP |
| | | VDS3 | 72 | 1 | 0 | 3 | 32 | 0 | 1CP |
| | | VDS2 | 17 | 0 | 0 | 8 | 12 | 0 | 3CP |
| | | VDS1 | 5 | 2 | 0 | 11 | 19 | 0 | 1SU |

| Date | 2-Nov-04 | Location | SK hold | SK spawn | SK dead | SK redd | KO live | KO dead | Other fish/Comments |
|---|---|---|---|---|---|---|---|---|---|
| Crew | KL | Riffles | 0 | 0 | 0 | 0 | 0 | 0 | |
| Time: *start* | 10:30 | VDS11 | 0 | 12 | 10 | 4 | 0 | 0 | |
| Time: *end* | 14:30 | VDS10 | 0 | 10 | 4 | 3 | 0 | 0 | |
| Water clarity (m) | 2 | VDS9 | 0 | 1 | 3 | 4 | 0 | 0 | |
| Cloud % | 100 | VDS8 | 0 | 1 | 7 | 3 | 0 | 0 | |
| Brightness | med-dark | VDS7 | 0 | 18 | 3 | 5 | 1 | 0 | 1CP, 1WF |
| Precipitation | nil | VDS6 | 0 | 82 | 4 | 19 | 3 | 0 | |
| Fish Visibility | high | VDS5 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | VDS4 | 0 | 17 | 0 | 5 | 0 | 0 | 1WF, 1CP |
| | | VDS3 | 0 | 20 | 1 | 12 | 3 | 0 | 3CP |
| | | VDS2 | 0 | 1 | 0 | 0 | 0 | 0 | |
| | | VDS1 | 0 | 0 | 1 | 0 | 0 | 0 | |

# APPENDIX C

## October Biological Sampling in Okanagan River

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 6 2004 | 200 | SK | F | 48 | N | Y | N | | |
| Oct 6 2004 | 201 | SK | F | 52 | N | Y | N | | |
| Oct 6 2004 | 202 | SK | F | 52 | N | Y | N | | |
| Oct 6 2004 | 203 | SK | F | 52 | N | Y | N | | |
| Oct 6 2004 | 204 | SK | F | 50 | N | Y | N | | |
| Oct 6 2004 | 205 | SK | F | 52 | N | Y | N | | |
| Oct 6 2004 | 206 | SK | F | 50.5 | N | Y | N | | |
| Oct 6 2004 | 207 | SK | F | 54 | N | Y | N | | |
| Oct 6 2004 | 208 | SK | F | 50 | N | Y | N | | |
| Oct 6 2004 | 209 | SK | F | 51 | N | Y | N | | |
| Oct 6 2004 | 210 | SK | F | 49 | N | Y | N | | |
| Oct 6 2004 | 211 | SK | F | 49.5 | N | Y | N | | |
| Oct 6 2004 | 212 | SK | M | 54 | N | Y | N | | |
| Oct 6 2004 | 213 | SK | M | 53 | N | Y | N | | |
| Oct 6 2004 | 214 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 215 | SK | M | 54 | N | Y | N | | |
| Oct 6 2004 | 216 | SK | M | 49 | N | Y | N | | |
| Oct 6 2004 | 217 | SK | M | 50 | N | Y | N | | |
| Oct 6 2004 | 218 | SK | M | 50 | N | Y | N | | |
| Oct 6 2004 | 219 | SK | M | 48 | N | Y | N | | |
| Oct 6 2004 | 220 | SK | M | 50 | N | Y | N | | |
| Oct 6 2004 | 221 | SK | M | 53 | N | Y | N | | |
| Oct 6 2004 | 222 | SK | M | 50 | N | Y | N | | |
| Oct 6 2004 | 223 | SK | M | 53 | N | Y | N | | |
| Oct 6 2004 | 224 | SK | M | 48 | N | Y | N | | |
| Oct 6 2004 | 225 | SK | M | 46 | N | Y | N | | |
| Oct 6 2004 | 226 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 227 | SK | M | 49 | N | Y | N | | |
| Oct 6 2004 | 228 | SK | M | 54 | N | Y | N | | |
| Oct 6 2004 | 229 | SK | M | 52 | N | Y | N | | |
| Oct 6 2004 | 230 | SK | M | 55 | N | Y | N | | |
| Oct 6 2004 | 231 | SK | M | 48 | N | Y | N | | |
| Oct 6 2004 | 232 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 233 | SK | M | 53 | N | Y | N | | |
| Oct 6 2004 | 234 | SK | M | 47 | N | Y | N | | |
| Oct 6 2004 | 235 | SK | M | 58 | N | Y | N | | |
| Oct 6 2004 | 236 | SK | M | 51 | N | Y | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 6 2004 | 237 | SK | M | 50 | N | Y | N | | |
| Oct 6 2004 | 238 | SK | M | 54 | N | Y | N | | |
| Oct 6 2004 | 239 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 240 | SK | M | 52 | N | Y | N | | |
| Oct 6 2004 | 241 | SK | M | 54 | N | Y | N | | |
| Oct 6 2004 | 242 | SK | M | 50 | N | Y | N | | |
| Oct 6 2004 | 243 | SK | M | 54 | N | Y | N | | |
| Oct 6 2004 | 244 | SK | M | 49 | N | Y | N | | |
| Oct 6 2004 | 245 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 246 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 247 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 248 | SK | M | 57 | N | Y | N | | |
| Oct 6 2004 | 249 | SK | M | 52 | N | Y | N | | |
| Oct 6 2004 | 250 | SK | M | 49 | N | Y | N | | |
| Oct 6 2004 | 251 | SK | M | 47 | N | Y | N | | |
| Oct 6 2004 | 252 | SK | M | 52 | N | Y | N | | |
| Oct 6 2004 | 253 | SK | M | 55 | N | Y | N | | |
| Oct 6 2004 | 254 | SK | M | 51 | N | Y | N | | |
| Oct 6 2004 | 255 | SK | F | 51 | N | Y | N | | |
| Oct 6 2004 | 256 | SK | F | 44 | N | Y | N | | |
| Oct 6 2004 | 257 | SK | F | 48 | N | Y | N | | |
| Oct 6 2004 | 258 | SK | F | 45 | N | Y | N | | |
| Oct 7 2004 | 259 | KO | M | 25 | N | Y | N | | |
| Oct 7 2004 | 260 | SK | F | 48 | N | otolith | Y | | |
| Oct 7 2004 | 261 | SK | M | | 1132 | otolith | Y | | |
| Oct 7 2004 | 262 | SK | F | 52 | 1046 | otolith | Y | | |
| Oct 7 2004 | 263 | SK | F | 50 | 1235 | otolith | Y | | |
| Oct 7 2004 | 264 | SK | F | 45 | 976 | otolith | Y | | |
| Oct 7 2004 | 265 | SK | F | 47 | 1052 | otolith | Y | | |
| Oct 7 2004 | 266 | SK | F | 49 | 1085 | otolith | Y | | |
| Oct 7 2004 | 267 | SK | F | 49 | 1195 | otolith | Y | | |
| Oct 7 2004 | 268 | SK | F | 46 | 981 | otolith | Y | | |
| Oct 7 2004 | 269 | SK | F | 50 | 1284 | otolith | Y | | |
| Oct 7 2004 | 270 | SK | F | 55 | 1637 | otolith | Y | | |
| Oct 7 2004 | 271 | SK | F | 50 | / | otolith | N | | broodstock |
| Oct 7 2004 | 272 | SK | F | 49 | / | otolith | N | | broodstock |
| Oct 7 2004 | 273 | SK | F | 51 | / | otolith | N | | broodstock |
| Oct 7 2004 | 274 | SK | F | 49 | / | otolith | N | | broodstock |
| Oct 7 2004 | 275 | SK | F | 53 | / | otolith | N | | broodstock |
| Oct 7 2004 | 276 | SK | F | 52 | 1380 | otolith | Y | | |
| Oct 7 2004 | 277 | SK | M | 53 | 1457 | - | N | | |
| Oct 7 2004 | 278 | SK | F | 48 | 1098 | otolith | Y | | |
| Oct 7 2004 | 279 | SK | F | 50 | 1148 | otolith | Y | | |
| Oct 7 2004 | 280 | SK | F | 46 | 1010 | otolith | Y | | |
| Oct 7 2004 | 281 | SK | F | 52 | 1496 | otolith | Y | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 7 2004 | 282 | SK | F | 51 | 1267 | otolith | Y | | |
| Oct 7 2004 | 283 | SK | F | 52 | 1450 | otolith | Y | | |
| Oct 7 2004 | 284 | SK | F | 54 | 1557 | otolith | Y | | |
| Oct 7 2004 | 285 | SK | F | 46 | 927 | otolith | Y | | |
| Oct 7 2004 | 286 | SK | M | 51 | 1310 | otolith | N | | |
| Oct 7 2004 | 287 | SK | M | 51 | 1370 | otolith | N | | |
| Oct 7 2004 | 288 | SK | M | 50 | 1145 | otolith | N | | |
| Oct 7 2004 | 289 | SK | M | 50 | 1053 | otolith | N | | |
| Oct 7 2004 | 290 | SK | M | 54 | 1360 | otolith | N | | |
| Oct 7 2004 | 291 | SK | M | 57 | 1907 | otolith | N | | |
| Oct 7 2004 | 292 | SK | M | 51 | 1364 | otolith | N | | |
| Oct 7 2004 | 293 | SK | M | 51 | 1050 | otolith | N | | |
| Oct 7 2004 | 294 | SK | M | 50 | 1140 | otolith | N | | |
| Oct 7 2004 | 295 | SK | M | 46 | 1030 | otolith | N | | |
| Oct 7 2004 | 296 | SK | M | 52 | 1340 | otolith | N | | |
| Oct 7 2004 | 297 | SK | M | 52 | 1460 | otolith | N | | |
| Oct 7 2004 | 298 | SK | M | 51 | 1324 | N | N | | |
| Oct 7 2004 | 299 | SK | M | 51 | 1192 | otolith | N | | |
| Oct 7 2004 | 300 | SK | M | 50 | 1200 | otolith | N | | |
| Oct 7 2004 | 301 | SK | M | 53 | 1440 | otolith | N | | |
| Oct 7 2004 | 302 | SK | M | 55 | 1765 | otolith | N | | |
| Oct 7 2004 | 303 | SK | M | 51 | 1254 | otolith | N | | |
| Oct 7 2004 | 304 | SK | M | 43 | 724 | N | N | | |
| Oct 7 2004 | 305 | SK | M | 53 | 1390 | otolith | N | | |
| Oct 7 2004 | 306 | SK | M | 51 | 1297 | otolith | N | | |
| Oct 7 2004 | 307 | SK | M | 50 | 1130 | otolith | N | | |
| Oct 7 2004 | 308 | SK | M | 51 | 1275 | otolith | N | | |
| Oct 7 2004 | 309 | SK | M | 51 | 1307 | otolith | N | | |
| Oct 7 2004 | 310 | SK | M | 53 | 1476 | otolith | N | | |
| Oct 7 2004 | 311 | SK | M | 52 | 1242 | otolith | N | | |
| Oct 7 2004 | 312 | SK | M | 50 | 1220 | otolith | N | | |
| Oct 7 2004 | 313 | SK | M | 50 | 1262 | otolith | N | | |
| Oct 7 2004 | 314 | SK | M | 51 | 1275 | - | N | | |
| Oct 7 2004 | 315 | SK | F | 50 | - | otolith | N | | broodstock |
| Oct 7 2004 | 316 | SK | F | 46 | - | otolith | N | | broodstock |
| Oct 7 2004 | 317 | SK | F | 51 | - | otolith | N | | broodstock |
| Oct 7 2004 | 318 | SK | F | 53 | - | otolith | N | | broodstock |
| Oct 7 2004 | 319 | SK | F | 49 | - | otolith | N | | broodstock |
| Oct 7 2004 | 320 | SK | F | 51 | - | otolith | N | | broodstock |
| Oct 7 2004 | 321 | SK | F | 50 | - | otolith | N | | broodstock |
| Oct 8 2004 | 322 | SK | F, green | 48 | 1109 | Y | Y | | |
| Oct 8 2004 | 323 | SK | F, green | 49 | 1250 | Y | Y | | |
| Oct 8 2004 | 324 | SK | F, green | 50.5 | 1320 | Y | Y | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 8 2004 | 325 | SK | F, green | 52 | 1478 | Y | Y | | |
| Oct 8 2004 | 326 | SK | F, green | 49.5 | 1303 | Y | Y | | |
| Oct 8 2004 | 327 | SK | F | N | N | N | N | | diseased |
| Oct 8 2004 | 328 | SK | F | 52.5 | - | Y | N | Y | |
| Oct 8 2004 | 329 | SK | F | 51 | - | Y | N | Y | |
| Oct 8 2004 | 330 | SK | F | 48.5 | - | Y | N | Y | |
| Oct 8 2004 | 331 | SK | F | 49 | - | Y | N | Y | |
| Oct 8 2004 | 332 | SK | F | 48 | - | Y | N | Y | |
| Oct 8 2004 | 333 | SK | F | 51 | - | Y | N | Y | |
| Oct 8 2004 | 334 | SK | F | 51.5 | - | Y | N | Y | |
| Oct 8 2004 | 335 | SK | F | 48 | - | Y | N | Y | |
| Oct 8 2004 | 336 | SK | F | 50 | - | Y | N | Y | |
| Oct 8 2004 | 337 | SK | F | 51 | - | Y | N | Y | |
| Oct 8 2004 | 338 | SK | F | 51 | 1225 | Y | N | | |
| Oct 8 2004 | 339 | SK | F | 53 | 1591 | Y | N | | |
| Oct 8 2004 | 340 | SK | F | 53.5 | 1389 | Y | N | | |
| Oct 8 2004 | 341 | SK | F | 53 | 1576 | Y | N | | |
| Oct 8 2004 | 342 | SK | F | 48 | 1065 | Y | N | | |
| Oct 8 2004 | 343 | SK | F | 53.5 | 1833 | Y | N | | |
| Oct 8 2004 | 344 | SK | F | 50 | 1232 | Y | N | | |
| Oct 8 2004 | 345 | SK | F | 59.5 | 1245 | Y | N | | |
| Oct 8 2004 | 346 | SK | F | 50.5 | 1340 | Y | N | | |
| Oct 8 2004 | 347 | SK | M | 44.5 | 816 | Y | N | | |
| Oct 8 2004 | 348 | SK | M | 49 | 1067 | Y | N | | |
| Oct 8 2004 | 349 | SK | M | 52.5 | 1404 | Y | N | | |
| Oct 8 2004 | 350 | SK | M | 51.5 | 1256 | Y | N | | |
| Oct 8 2004 | 351 | SK | M | 46 | 845 | Y | N | | |
| Oct 8 2004 | 352 | SK | F | 47.5 | / | Y | N | Y | |
| Oct 8 2004 | 353 | SK | F | 50 | / | Y | N | Y | |
| Oct 8 2004 | 354 | SK | F | 49.5 | / | Y | N | Y | |
| Oct 8 2004 | 355 | SK | F | 50 | / | Y | N | Y | |
| Oct 8 2004 | 356 | SK | F | 48.5 | / | Y | N | Y | |
| Oct 8 2004 | 357 | SK | M | 50.5 | 1241 | Y | N | | |
| Oct 8 2004 | 358 | SK | M | 50 | 1139 | Y | N | | |
| Oct 8 2004 | 359 | SK | M | 50.5 | 1255 | Y | N | | |
| Oct 8 2004 | 360 | SK | M | 49.5 | 1101 | Y | N | | |
| Oct 8 2004 | 361 | SK | M | 48.5 | 1174 | Y | N | | |
| Oct 8 2004 | 362 | SK | M | 50 | 1360 | Y | N | | |
| Oct 8 2004 | 363 | SK | F | 51 | N | Y | N | Y | |
| Oct 8 2004 | 364 | SK | F | 50.5 | N | Y | N | Y | |
| Oct 8 2004 | 365 | SK | F | 52.5 | N | Y | N | Y | |
| Oct 8 2004 | 366 | SK | F | 50 | N | Y | N | Y | |
| Oct 9 2004 | 367 | SK | M | 51 | 1338 | Y | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 9 2004 | 368 | SK | M | 50 | 986 | Y | N | | |
| Oct 9 2004 | 369 | SK | M | 52 | N | Y | N | | |
| Oct 9 2004 | 370 | SK | M | 52 | 1150 | Y | N | | |
| Oct 9 2004 | 371 | SK | M | 50 | 1175 | Y | N | | |
| Oct 9 2004 | 372 | SK | M | 52 | 1257 | Y | N | | |
| Oct 9 2004 | 373 | SK | M | 56 | 1736 | Y | N | | |
| Oct 9 2004 | 374 | SK | F | 47.5 | N | Y | N | Y | |
| Oct 9 2004 | 375 | SK | F | 45 | N | Y | N | Y | |
| Oct 9 2004 | 376 | SK | M | 49 | 1309 | Y | N | | |
| Oct 9 2004 | 377 | SK | M | 51 | 1304 | Y | N | | |
| Oct 9 2004 | 378 | SK | F | 49 | N | Y | N | Y | |
| Oct 9 2004 | 379 | SK | M | 54 | 1468 | Y | N | | |
| Oct 9 2004 | 380 | SK | F | 53.5 | N | Y | N | Y | |
| Oct 9 2004 | 381 | SK | M | 51 | 1283 | Y | N | | |
| Oct 9 2004 | 382 | SK | M | 52.5 | 1473 | Y | N | | |
| Oct 9 2004 | 383 | SK | M | 49.5 | 1121 | Y | N | | |
| Oct 9 2004 | 384 | SK | F, green | 49 | 1219 | Y | Y | | |
| Oct 9 2004 | 385 | SK | F, green | 50 | 1269 | Y | Y | | |
| Oct 9 2004 | 386 | SK | F, green | 48 | 956 | Y | Y | | |
| Oct 9 2004 | 387 | SK | F | 53.5 | N | Y | Y | Y | |
| Oct 9 2004 | 388 | SK | F | 49 | N | Y | N | Y | |
| Oct 9 2004 | 389 | SK | F | 49.5 | N | Y | N | Y | |
| Oct 9 2004 | 390 | SK | F | 49.5 | N | Y | N | Y | |
| Oct 9 2004 | 391 | SK | F, green | 45 | 924 | Y | N | | |
| Oct 9 2004 | 392 | SK | F, green | 47.5 | 1010 | Y | N | | |
| Oct 9 2004 | 393 | SK | F | 50 | N | Y | N | | |
| Oct 9 2004 | 394 | SK | F | 50 | N | Y | N | | |
| Oct 9 2004 | 395 | SK | F | 44.5 | N | Y | N | | |
| Oct 10/04 | 396 | SK | M | 49.5 | 1060 | Y | N | | |
| Oct 10/04 | 397 | SK | M | 52.5 | 1402 | Y | N | | |
| Oct 10/04 | 398 | SK | M | 53 | 1569 | Y | N | | |
| Oct 10/04 | 399 | SK | M | 54 | 1448 | Y | N | | |
| Oct 10/04 | 400 | SK | M | 47.5 | 1070 | Y | N | | |
| Oct 10/04 | 401 | SK | M | 51 | 1347 | Y | N | | |
| Oct 10/04 | 402 | SK | F | 51.5 | N | Y | N | Y | |
| Oct 10/04 | 403 | SK | F | 47.5 | N | Y | N | Y | |
| Oct 10/04 | 404 | SK | F | 49 | N | Y | N | Y | |
| Oct 10/04 | 405 | SK | F | 51 | 2018 | Y | Y+30 | | |
| Oct 10/04 | 406 | SK | F | 49.5 | N | Y | N | Y | |
| Oct 10/04 | 407 | SK | M | 51.5 | 1421 | Y | N | | |
| Oct 10/04 | 408 | SK | M | 52 | 1414 | Y | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 10/04 | 409 | SK | M | 52 | 1180 | Y | N | | |
| Oct 10/04 | 410 | SK | M | 53.5 | 1604 | Y | N | | |
| Oct 10/04 | 411 | SK | M | 48.5 | 1140 | Y | N | | |
| Oct 10/04 | 412 | SK | M | 49.5 | 1129 | Y | N | | |
| Oct 10/04 | 413 | SK | M | 50.5 | 1393 | Y | N | | |
| Oct 10/04 | 414 | SK | M | 50.5 | 1231 | Y | N | | |
| Oct 10/04 | 415 | SK | M | 51 | 1232 | Y | N | | |
| Oct 10/04 | 416 | SK | M | 52 | 1304 | Y | N | | |
| Oct 10/04 | 417 | SK | M | 52 | 1310 | Y | N | | |
| Oct 10/04 | 418 | SK | M | 50.5 | 1189 | Y | N | | |
| Oct 10/04 | 419 | SK | M | 47.5 | 1121 | Y | N | | |
| Oct 10/04 | 420 | SK | M | 54 | 1542 | Y | N | | |
| Oct 10/04 | 421 | SK | M | 48 | 1093 | Y | N | | |
| Oct 10/04 | 422 | SK | M | 51.5 | 1472 | Y | N | | |
| Oct 10/04 | 423 | SK | F | 52.5 | N | Y | N | Y | |
| Oct 10/04 | 424 | SK | F | 46 | N | Y | N | Y | |
| Oct 10/04 | 425 | SK | F | 51.5 | N | Y | N | Y | |
| Oct 10/04 | 426 | SK | F | 48.5 | N | Y | N | Y | |
| Oct 10/04 | 427 | SK | F | 50 | N | Y | N | Y | |
| Oct 10/04 | 428 | SK | F | 51.5 | N | Y | N | Y | |
| Oct 10/04 | 429 | SK | F | 51 | N | Y | N | Y | |
| Oct 10/04 | 430 | SK | F | 50 | N | Y | N | Y | |
| Oct 12/04 | 431 | SK | F, green | 53.5 | 1488 | otolith | Y | | |
| Oct 12/04 | 432 | SK | F, green | 46 | 1015 | otolith | N | | |
| Oct 12/04 | 433 | SK | F, green | 47.5 | 1091 | otolith | Y | | |
| Oct 12/04 | 434 | SK | F, green | 49 | 1035 | otolith | Y | | |
| Oct 12/04 | 435 | SK | F, green | 45.5 | 907 | rotten | Y | | |
| Oct 12/04 | 436 | SK | M | 50 | 1260 | otolith | N | | |
| Oct 12/04 | 437 | SK | M | 51 | 1290 | otolith | N | | |
| Oct 12/04 | 438 | SK | M | 50 | N | N | N | | |
| Oct 12/04 | 439 | SK | F | 51 | N | otolith | N | Y | |
| Oct 12/04 | 440 | SK | F | 50 | N | otolith | N | Y | |
| Oct 12/04 | 441 | SK | F | 51 | N | otolith | N | Y | |
| Oct 12/04 | 442 | SK | F | 53 | 1162 | otolith | N | | |
| Oct 12/04 | 443 | SK | M | 48.5 | 913 | otolith | N | | |
| Oct 12/04 | 444 | SK | M | 47.5 | 1420 | otolith | N | | |
| Oct 12/04 | 445 | SK | M | 52 | 1200 | otolith | N | | |
| Oct 12/04 | 446 | SK | M | 50.5 | 1413 | otolith | N | | |
| Oct 12/04 | 447 | SK | M | 52 | 1456 | otolith | N | | |
| Oct 12/04 | 448 | SK | M | 52.5 | 1250 | otolith | N | | |
| Oct 12/04 | 449 | SK | M | 49 | 1958 | otolith | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct 12/04 | 450 | SK | M | 56.5 | 1119 | otolith | N | | |
| Oct 12/04 | 451 | SK | M | 51 | 1517 | otolith | N | | |
| Oct 12/04 | 452 | SK | M | 53.5 | 1246 | otolith | N | | |
| Oct 12/04 | 453 | SK | M | 48.5 | 1215 | otolith | N | | |
| Oct 12/04 | 454 | SK | M | 51.5 | 1212 | otolith | N | | |
| Oct 12/04 | 455 | SK | M | 51 | N | otolith | N | | |
| Oct 12/04 | 456 | SK | F | 46 | N | otolith | N | Y | |
| Oct 12/04 | 457 | SK | F | 49 | N | otolith | N | Y | |
| Oct 12/04 | 458 | SK | F | 55 | N | otolith | N | Y | |
| Oct 12/04 | 459 | SK | F | 50.5 | N | otolith | N | Y | |
| Oct 12/04 | 460 | SK | F | 48 | N | otolith | N | Y | |
| Oct 12/04 | 461 | SK | F | 51 | N | N | N | Y | |
| Oct 12/04 | 462 | SK | F | 46.5 | N | otolith | N | Y | |
| Oct 12/04 | 463 | SK | F | 51 | N | otolith | N | Y | |
| Oct13/04 | 464 | SK | M | 53 | 1483 | Y | N | | |
| Oct13/04 | 465 | SK | M | 51.5 | 1370 | Y | N | | |
| Oct13/04 | 466 | SK | M | 51 | 1215 | Y | N | | |
| Oct13/04 | 467 | SK | M | 50.5 | 1144 | Y | N | | |
| Oct13/04 | 468 | SK | M | 48 | 1199 | Y | N | | |
| Oct13/04 | 469 | SK | M | 54 | 1631 | Y | N | | |
| Oct13/04 | 470 | SK | M | 48 | 1178 | Y | N | | |
| Oct13/04 | 471 | SK | M | 49 | 1195 | Y | N | | |
| Oct13/04 | 472 | SK | M | 46 | 1023 | Y | N | | |
| Oct13/04 | 473 | SK | M | 52 | 1460 | Y | N | | |
| Oct13/04 | 474 | SK | M | 50 | 1111 | Y | N | | |
| Oct13/04 | 475 | SK | M | 50.5 | 1119 | Y | N | | |
| Oct13/04 | 476 | SK | M | 49 | 1077 | Y | N | | |
| Oct13/04 | 477 | SK | M | 47 | 1091 | Y | N | | |
| Oct13/04 | 478 | SK | M | 48.5 | 1219 | Y | N | | |
| Oct13/04 | 479 | SK | F | 57.5 | N | otolith | N | Y | |
| Oct13/04 | 480 | SK | F | 49 | N | otolith | N | Y | |
| Oct13/04 | 481 | SK | F | 51 | N | otolith | N | Y | |
| Oct13/04 | 482 | SK | F | 55 | N | otolith | N | Y | |
| Oct13/04 | 483 | SK | F | 50.5 | N | otolith | N | Y | |
| Oct13/04 | 484 | SK | F | 48 | N | otolith | N | Y | |
| Oct13/04 | 485 | SK | F | 48 | N | otolith | N | Y | |
| Oct13/04 | 486 | SK | F | 48 | N | otolith | N | Y | |
| Oct13/04 | 487 | SK | M | 51 | 1371 | Y | N | | |
| Oct13/04 | 488 | SK | M | 52.5 | 1298 | Y | N | | |
| Oct13/04 | 489 | SK | M | 51 | 1331 | Y | N | | |
| Oct13/04 | 490 | SK | M | 52.5 | 1411 | Y | N | | |
| Oct13/04 | 491 | SK | M | 50 | 1145 | Y | N | | |
| Oct13/04 | 492 | SK | M | 49.5 | 1025 | Y | N | | |
| Oct13/04 | 493 | SK | M | 55 | 1307 | Y | N | | |
| Oct13/04 | 494 | SK | M | 47 | 602 | Y | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct13/04 | 495 | SK | M | 48.5 | 900 | Y | N | | |
| Oct13/04 | 496 | SK | M | 50.5 | 1317 | Y | N | | |
| Oct13/04 | 497 | SK | M | 52 | 1352 | Y | N | | |
| Oct13/04 | 498 | SK | M | 55.5 | 1723 | Y | N | | |
| Oct13/04 | 499 | SK | M | 49.5 | 1148 | Y | N | | |
| Oct13/04 | 500 | SK | M | 52 | 1542 | Y | N | | |
| Oct13/04 | 501 | SK | M | 50.5 | 1376 | Y | N | | |
| Oct13/04 | 502 | SK | M | 53 | 1481 | Y | N | | |
| Oct13/04 | 503 | SK | F | 50.5 | N | otolith | N | Y | |
| Oct13/04 | 504 | SK | F | 51.5 | N | otolith | N | Y | |
| Oct13/04 | 505 | SK | F | 48 | N | otolith | N | Y | |
| Oct13/04 | 506 | SK | F | 52 | 1460 | otolith | Y | | |
| Oct13/04 | 507 | SK | F | 50 | 1300 | otolith | Y | | |
| Oct13/04 | 508 | SK | F | 52 | 1266 | otolith | Y | | |
| Oct13/04 | 509 | SK | F | 53.5 | 1576 | otolith | Y | | |
| Oct13/04 | 510 | SK | F | 47 | 1031 | otolith | Y | | |
| Oct13/04 | 511 | SK | F | 51.5 | 1064 | otolith | Y | | |
| Oct13/04 | 512 | SK | F | 54 | N | otolith | N | Y | |
| Oct13/04 | 513 | SK | F | 53 | N | otolith | N | Y | |
| Oct13/04 | 514 | SK | F | 46.5 | N | N | N | Y | |
| Oct13/04 | 515 | SK | F | 53 | N | otolith | N | Y | |
| Oct13/04 | 516 | SK | F | 47 | N | N | N | Y | |
| Oct13/04 | 517 | SK | F | 50 | N | otolith | N | Y | |
| Oct13/04 | 518 | SK | F | 48.5 | N | otolith | N | Y | |
| Oct13/04 | 519 | SK | F | 51 | N | otolith | N | Y | |
| Oct14/04 | 520 | SK | M | 52 | 1467 | Y | N | | |
| Oct14/04 | 521 | SK | M | 52 | 1434 | Y | N | | |
| Oct14/04 | 522 | SK | M | 46 | 950 | Y | N | | |
| Oct14/04 | 523 | SK | M | 52.5 | 1339 | Y | N | | |
| Oct14/04 | 524 | SK | M | 49 | 1106 | Y | N | | |
| Oct14/04 | 525 | SK | M | 54.5 | 1632 | Y | N | | |
| Oct14/04 | 526 | SK | M | 46 | 991 | Y | N | | |
| Oct14/04 | 527 | SK | M | 49 | 1194 | Y | N | | |
| Oct14/04 | 528 | SK | M | 51 | 1326 | Y | N | | |
| Oct14/04 | 529 | SK | M | 53 | 1459 | Y | N | | |
| Oct14/04 | 530 | SK | M | 51 | 1367 | Y | N | | |
| Oct14/04 | 531 | SK | M | 48.5 | 1068 | Y | N | | |
| Oct14/04 | 532 | SK | M | 50 | 1220 | Y | N | | |
| Oct14/04 | 533 | SK | F | 50.5 | 912 | otolith | N | Y | |
| Oct14/04 | 534 | SK | F | 51.5 | 1034 | otolith | N | Y | |
| Oct14/04 | 535 | SK | F | 52 | 1106 | otolith | N | Y | |
| Oct14/04 | 536 | SK | F | 47 | 805 | otolith | N | Y | |
| Oct14/04 | 537 | SK | F | 51.5 | 1011 | otolith | N | Y | |
| Oct14/04 | 538 | SK | F | 47.5 | 755 | otolith | N | Y | |
| Oct14/04 | 539 | SK | F | 50.5 | 920 | otolith | N | Y | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct14/04 | 540 | SK | M | 57 | 1720 | Y | N | | |
| Oct14/04 | 541 | SK | M | 51.5 | 1268 | Y | N | | |
| Oct14/04 | 542 | SK | M | 53 | 1487 | Y | N | | |
| Oct14/04 | 543 | SK | M | 52.5 | 1306 | Y | N | | |
| Oct14/04 | 544 | SK | M | 52.5 | 1331 | Y | N | | |
| Oct14/04 | 545 | SK | F, green | 45 | 972 | Y | Y | | |
| Oct14/04 | 546 | SK | F, green | 51 | 1117 | otolith | Y | | |
| Oct14/04 | 547 | SK | F, green | 50 | 1247 | otolith | Y | | |
| Oct14/04 | 548 | SK | F, green | 49 | 1266 | otolith | Y | | |
| Oct14/04 | 549 | SK | F, green | 47 | 979 | otolith | Y | | |
| Oct14/04 | 550 | SK | F | 49 | N | otolith | N | Y | |
| Oct14/04 | 551 | SK | F | | N | otolith | N | Y | |
| Oct14/04 | 552 | SK | F | 50 | N | otolith | N | Y | |
| Oct14/04 | 553 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct14/04 | 554 | SK | F | 51.5 | N | otolith | N | Y | |
| Oct14/04 | 555 | SK | F | 48 | N | otolith | N | Y | |
| Oct14/04 | 556 | SK | F | 47.5 | N | otolith | N | Y | |
| Oct14/04 | 557 | SK | F | 49 | N | otolith | N | Y | |
| Oct15/04 | 558 | SK | M | 50.5 | 1107 | Y | N | | |
| Oct15/04 | 559 | SK | M | 49 | 1228 | Y | N | | |
| Oct15/04 | 560 | SK | M | 50.5 | 1107 | Y | N | | |
| Oct15/04 | 561 | SK | M | 48 | 1111 | Y | N | | |
| Oct15/04 | 562 | SK | M | 51 | 1154 | Y | N | | |
| Oct15/04 | 563 | SK | M | 47.5 | 1037 | Y | N | | |
| Oct15/04 | 564 | SK | M | 51 | 1473 | Y | N | | |
| Oct15/04 | 565 | SK | M | 48.5 | 1081 | Y | N | | |
| Oct15/04 | 566 | SK | M | 49 | 1192 | Y | N | | |
| Oct15/04 | 567 | SK | M | 54 | 1372 | Y | N | | |
| Oct15/04 | 568 | SK | M | 53.5 | 1497 | Y | N | | |
| Oct15/04 | 569 | SK | F | 50 | N | otolith | N | Y | |
| Oct15/ 04 | 570 | SK | F | 47.5 | N | otolith | N | Y | |
| Oct15/04 | 571 | SK | F | 50.5 | N | otolith | N | Y | |
| Oct15/04 | 572 | SK | F | 52 | N | otolith | N | Y | |
| Oct15/04 | 573 | SK | F, green | 49.5 | N | otolith | Y | | |
| Oct15/04 | 574 | SK | F | 47.5 | N | otolith | N | Y | |
| Oct15/04 | 575 | SK | F | 51 | N | otolith | N | Y | |
| Oct15/04 | 576 | SK | F | 49 | N | otolith | N | Y | |
| Oct15/04 | 577 | SK | F | 48 | N | otolith | N | Y | |
| Oct15/04 | 578 | SK | F | 47.5 | N | otolith | N | Y | |
| Oct15/04 | 579 | SK | F | 53.5 | N | otolith | N | Y | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct15/04 | 580 | SK | M | 47.5 | 818 | Y | N | | |
| Oct15/04 | 581 | SK | M | 47 | 872 | Y | N | | |
| Oct15/04 | 582 | SK | M | 50.5 | 1200 | Y | N | | |
| Oct15/04 | 583 | SK | M | 48 | 1044 | Y | N | | |
| Oct15/04 | 584 | SK | M | 53.5 | 1401 | Y | N | | |
| Oct15/04 | 585 | SK | M | 57 | 1808 | Y | N | | |
| Oct15/04 | 586 | SK | F | 47.5 | N | otolith | N | Y | |
| Oct15/04 | 587 | SK | F | 47 | N | otolith | N | Y | |
| Oct15/04 | 588 | SK | F | 51.5 | N | otolith | N | Y | |
| Oct15/04 | 589 | SK | F | 50 | N | otolith | N | Y | |
| Oct15/04 | 590 | SK | F | 45.5 | N | otolith | N | Y | |
| Oct15/04 | 591 | SK | F | 52 | N | otolith | N | Y | |
| Oct16/04 | 592 | SK | M | 48.5 | 1178 | Y | N | | |
| Oct16/04 | 593 | SK | M | 54.5 | 1687 | Y | N | | |
| Oct16/04 | 594 | SK | M | 52 | 1382 | Y | N | | |
| Oct16/04 | 595 | SK | M | 48 | 1106 | Y | N | | |
| Oct16/04 | 596 | SK | M | 50.5 | 1205 | Y | N | | |
| Oct16/04 | 597 | SK | M | 50.5 | 1327 | Y | N | | |
| Oct16/04 | 598 | SK | M | 49 | 1136 | Y | N | | |
| Oct16/04 | 599 | SK | M | 50 | 1226 | Y | N | | |
| Oct16/04 | 600 | SK | M | 50 | 1319 | Y | N | | |
| Oct16/04 | 601 | SK | M | 50.5 | 1335 | Y | N | | |
| Oct16/04 | 602 | SK | M | 52 | 1341 | Y | N | | |
| Oct16/04 | 603 | SK | F | 49 | N | otolith | N | Y | |
| Oct16/04 | 604 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct16/04 | 605 | SK | F | 52 | N | otolith | N | Y | |
| Oct16/04 | 606 | SK | F | 46 | N | otolith | N | Y | |
| Oct16/04 | 607 | SK | F | 48 | N | otolith | N | Y | |
| Oct16/04 | 608 | SK | F | 51 | N | otolith | N | Y | |
| Oct16/04 | 609 | SK | F | 53.5 | N | otolith | N | Y | |
| Oct16/04 | 610 | SK | F | 52.5 | N | otolith | N | Y | |
| Oct16/04 | 611 | SK | F | 48.5 | N | otolith | N | Y | |
| Oct16/04 | 612 | SK | F | 50.5 | N | otolith | N | Y | |
| Oct17/04 | 613 | SK | M | 47 | 1058 | Y | N | | |
| Oct17/04 | 614 | SK | M | 51 | 1301 | Y | N | | |
| Oct17/04 | 615 | SK | M | 54 | 1486 | Y | N | | |
| Oct17/04 | 616 | SK | M | 49.5 | 1283 | Y | N | | |
| Oct17/04 | 617 | SK | M | 48 | 1059 | Y | N | | |
| Oct17/04 | 618 | SK | M | 53 | 1349 | Y | N | | |
| Oct17/04 | 619 | SK | M | 55.5 | 1616 | Y | N | | |
| Oct17/04 | 620 | SK | M | 51 | 1311 | Y | N | | |
| Oct17/04 | 621 | SK | M | 51 | 1162 | Y | N | | |
| Oct17/04 | 622 | SK | M | 53 | 1312 | Y | N | | |
| Oct17/04 | 623 | SK | M | 50.5 | 1333 | Y | N | | |
| Oct17/04 | 624 | SK | M | 51.5 | 1169 | Y | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct17/04 | 625 | SK | F | 51.5 | N | Y | N | | |
| Oct17/04 | 626 | SK | F | 52 | N | Y | N | | |
| Oct17/04 | 627 | SK | F | 50.5 | N | Y | N | | |
| Oct17/04 | 628 | SK | F | 53 | N | Y | N | | |
| Oct17/04 | 629 | SK | F | 50 | N | Y | N | | |
| Oct17/04 | 630 | SK | F | 47 | N | Y | N | | |
| Oct17/04 | 631 | SK | F | 48 | N | Y | N | | |
| Oct17/04 | 632 | SK | F | 50 | N | Y | N | | |
| Oct17/04 | 633 | SK | F | 53 | N | Y | N | | |
| Oct17/04 | 634 | SK | F | 53 | N | Y | N | | |
| Oct17/04 | 635 | SK | F | 49 | N | Y | N | | |
| Oct18/04 | 636 | SK | M | 51.5 | 1256 | Y | N | | |
| Oct18/04 | 637 | SK | M | 50 | 1177 | Y | N | | |
| Oct18/04 | 638 | SK | M | 54.5 | 1391 | Y | N | | |
| Oct18/04 | 639 | SK | M | 54 | 1589 | Y | N | | |
| Oct18/04 | 640 | SK | M | 49.5 | 1219 | Y | N | | |
| Oct18/04 | 641 | SK | M | 52 | 1407 | Y | N | | |
| Oct18/04 | 642 | SK | M | 47 | 926 | Y | N | | |
| Oct18/04 | 643 | SK | M | 49 | 1126 | Y | N | | |
| Oct18/04 | 644 | SK | M | 50.5 | 1325 | Y | N | | |
| Oct18/04 | 645 | SK | M | 52 | 1291 | Y | N | | |
| Oct18/04 | 646 | SK | M | 50 | 1336 | Y | N | | |
| Oct18/04 | 647 | SK | F | 48 | N | otolith | N | | |
| Oct18/04 | 648 | SK | F | 50 | N | otolith | N | | |
| Oct18/04 | 649 | SK | F | 49.5 | N | otolith | N | | |
| Oct18/04 | 650 | SK | F | 55.5 | N | otolith | N | | |
| Oct18/04 | 651 | SK | F | 49 | N | otolith | N | | |
| Oct18/04 | 652 | SK | F | N | N | otolith | N | | |
| Oct18/04 | 653 | SK | F | 49 | N | otolith | N | | |
| Oct18/04 | 654 | SK | F | 50 | N | otolith | N | | |
| Oct18/04 | 655 | SK | F | 44.5 | N | otolith | N | | |
| Oct18/04 | 656 | SK | F | 50 | N | otolith | N | | |
| Oct18/04 | 657 | SK | F | 52.5 | N | otolith | N | | |
| Oct18/04 | 658 | SK | F | 46.5 | N | otolith | N | | |
| Oct19/04 | 659 | SK | M | 52 | 1467 | Y | N | | |
| Oct19/04 | 660 | SK | M | 51.5 | 1295 | Y | N | | |
| Oct19/04 | 661 | SK | M | 49 | 1130 | Y | N | | |
| Oct19/04 | 662 | SK | M | 51.5 | 1407 | Y | N | | |
| Oct19/04 | 663 | SK | M | 49.5 | 1121 | Y | N | | |
| Oct19/04 | 664 | SK | M | 49.5 | 1126 | Y | N | | |
| Oct19/04 | 665 | SK | M | 51.5 | 1246 | Y | N | | |
| Oct19/04 | 666 | SK | M | 50 | 1054 | Y | N | | |
| Oct19/04 | 667 | SK | M | 51.5 | 1352 | Y | N | | |
| Oct19/04 | 668 | SK | M | 49 | 1075 | Y | N | | |
| Oct19/04 | 669 | SK | M | 49 | 1118 | Y | N | | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct19/04 | 670 | SK | M | 49.5 | 1148 | Y | N | | |
| Oct19/04 | 671 | SK | M | 47.5 | 993 | Y | N | | |
| Oct19/04 | 672 | SK | M | 50 | 1240 | Y | N | | |
| Oct19/04 | 673 | SK | M | 55 | 1504 | Y | N | | |
| Oct19/04 | 674 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct19/04 | 675 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct19/04 | 676 | SK | F | 49 | N | otolith | N | Y | |
| Oct19/04 | 677 | SK | F | 53 | N | otolith | N | Y | |
| Oct19/04 | 678 | SK | F | 44 | N | otolith | N | Y | |
| Oct19/04 | 679 | SK | F | 49 | N | otolith | N | Y | |
| Oct19/04 | 680 | SK | F | 49 | N | otolith | N | Y | |
| Oct19/04 | 681 | SK | F | 56 | N | otolith | N | Y | |
| Oct19/04 | 682 | SK | F | 52 | N | otolith | N | Y | |
| Oct19/04 | 683 | SK | F | 50 | N | otolith | N | Y | |
| Oct19/04 | 684 | SK | - | 49 | N | otolith | N | Y | |
| Oct20/04 | 680a | SK | M | 49 | 1177 | Y | N | | |
| Oct20/04 | 681a | SK | M | 56 | 1641 | Y | N | | |
| Oct20/04 | 682a | SK | M | 52 | 1321 | Y | N | | |
| Oct20/04 | 683a | SK | M | 50 | 1221 | Y | N | | |
| Oct20/04 | 684a | SK | M | 49 | 1345 | Y | N | | |
| Oct20/04 | 685 | SK | M | 49 | 1043 | Y | N | | |
| Oct20/04 | 686 | SK | M | 52 | 1347 | Y | N | | |
| Oct20/04 | 687 | SK | M | 54 | N | Y | N | | |
| Oct20/04 | 688 | SK | F | 47 | N | Y | N | Y | |
| Oct20/ 04 | 689 | SK | F | 49 | N | otolith | N | Y | |
| Oct20/04 | 690 | SK | F | 45.5 | N | otolith | N | Y | |
| Oct20/04 | 691 | SK | F | 48 | N | otolith | N | Y | |
| Oct20/04 | 692 | SK | F | 50 | N | otolith | N | Y | |
| Oct20/04 | 693 | SK | F | 49 | N | otolith | N | Y | |
| Oct21/04 | 694 | SK | M | 47 | 1078 | otolith | N | | |
| Oct21/04 | 695 | SK | M | 51.5 | 1425 | otolith | N | | |
| Oct21/04 | 696 | SK | M | 52.5 | 968 | otolith | N | | |
| Oct21/04 | 697 | SK | M | 50.5 | 1252 | otolith | N | | |
| Oct21/04 | 698 | SK | M | 51.5 | 1321 | otolith | N | | |
| Oct21/04 | 699 | SK | M | 51 | 1270 | otolith | N | | |
| Oct21/04 | 700 | SK | M | 48 | 951 | otolith | N | | |
| Oct21/04 | 701 | SK | F | 52 | N | otolith | N | Y | |
| Oct21/04 | 702 | SK | F | 53 | N | otolith | N | Y | |
| Oct21/04 | 703 | SK | F | 48.5 | N | otolith | N | Y | |
| Oct21/04 | 704 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct21/04 | 705 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct21/04 | 706 | SK | M | 50 | 1242 | otolith | N | | |
| Oct21/04 | 707 | SK | F | 49.5 | N | otolith | N | Y | |
| Oct21/04 | 708 | SK | F | 52.5 | N | otolith | N | Y | |
| Oct21/04 | 709 | SK | F | 46.5 | N | otolith | N | Y | |

| Date | ONA no. | Spp. | Sex (M/F) | Length (cm) | Weight (g) | Head (Y/N) | Eggs (Y/N) | Ovarian fluid (Y/N) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Oct21/04 | 710 | SK | F | 48.5 | N | otolith | N | Y | |
| 7-Oct-04 | | RBT | | 39 | | | | | DNA punch taken |
| 18-Oct-04 | | CH | M | 60 | | | | | DNA punch taken, unclipped |
| 13-Oct-04 | | CH | | 60 | | | | | DNA punch taken, unclipped |
| 12-Oct-04 | | CH | M | 39.5 | | | | | DNA punch taken, unclipped |
| 15-Oct-04 | | CH | | 47.5 | | | | | DNA punch taken, unclipped |

# APPENDIX D
## August and September Biological Sampling

| Date 2004 | ONA number | Lake | Species | Sex M/F | Length (cm) | Weight (g) | Scale sample Y/N | Head sample Y/N | Eggs Y/N | DFO Vial # DNA | DFO Vial # Kidney | Capture Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-Aug | 38 | Osoyoos | SK | F | 48.0 | 1331.0 | Y | Y | N | 1301 | 1302 | gillnetting |
| 25-Aug | 39 | Osoyoos | SK | M | 53.0 | 1365.0 | Y | Y | N | 1321 | 1322 | gillnetting |
| 25-Aug | 1 | Osoyoos | RBT | M | 50.0 | 1307.0 | Y | Y | N | 1325 | 1326 | gillnetting |
| 27-Aug | 40 | Osoyoos | SK | M | 54.0 | 1563.8 | absorbed | Y | N | 1341 | 1342 | gillnetting |
| 31-Aug | 41 | Osoyoos | SK | F | 52.1 | 1441.0 | absorbed | Y | Y | 1391 | 1392 | gillnetting |
| 31-Aug | 42 | Osoyoos | SK | M | 48.5 | 1196.0 | N | Y | N | 1393 | 1394 | gillnetting |
| 31-Aug | 43 | Osoyoos | SK | F | 48.8 | 1174.0 | Y | Y | Y | 1395 | 1396 | gillnetting |
| 31-Aug | 44 | Osoyoos | SK | M | 49.3 | 1443.0 | N | Y | N | 1397 | 1398 | gillnetting |
| 31-Aug | 45 | Osoyoos | SK | M | 51.3 | 1419.0 | N | Y | N | 1399 | 1400 | gillnetting |
| 31-Aug | 46 | Osoyoos | SK | M | 52.1 | 1634.0 | N | Y | N | 1401 | 1402 | gillnetting |
| 31-Aug | 47 | Osoyoos | SK | M | 53.8 | 1660.0 | N | Y | N | 1403 | 1404 | gillnetting |
| 31-Aug | 48 | Osoyoos | SK | M | 45.7 | 1065.0 | Y | Y | N | 1405 | 1406 | gillnetting |
| 31-Aug | 49 | Osoyoos | SK | M | 49.0 | 1345.0 | Y | Y | N | 1407 | 1408 | gillnetting |
| 31-Aug | 50 | Osoyoos | SK | M | 47.8 | 1424.0 | Y | Y | N | 1409 | 1410 | gillnetting |
| 31-Aug | 51 | Osoyoos | SK | M | 49.8 | 1325.0 | N | Y | N | 1411 | 1412 | gillnetting |
| 1-Sep | 52 | Osoyoos | SK | M | 51.1 | 1436.0 | N | Y | N | 1445 | 1446 | gillnetting |
| 1-Sep | 53 | Osoyoos | SK | M | 53.2 | 1049.0 | N | Y | N | 1447 | 1448 | gillnetting |
| 1-Sep | 54 | Osoyoos | SK | M | 56.8 | 2054.0 | N | Y | N | 1449 | 1450 | gillnetting |
| 1-Sep | 55 | Osoyoos | SK | M | 48.4 | 1323.0 | N | Y | N | 1451 | 1452 | gillnetting |
| 1-Sep | 56 | Osoyoos | SK | F | 55.0 | 1714.0 | N | Y | N | 1453 | 1454 | gillnetting |
| 1-Sep | 57 | Osoyoos | SK | M | 52.1 | 1634.0 | N | Y | N | 1455 | 1456 | gillnetting |
| 1-Sep | 58 | Osoyoos | SK | M | 48.1 | 1098.0 | N | Y | N | 1457 | 1458 | gillnetting |
| 1-Sep | 59 | Osoyoos | SK | F | 50.1 | 1335.0 | N | Y | Y | 1459 | 1460 | gillnetting |
| 1-Sep | 60 | Osoyoos | SK | M | 49.9 | 1322.0 | N | Y | N | 1461 | 1462 | gillnetting |
| 1-Sep | 61 | Osoyoos | SK | F | 48.3 | 1233.0 | N | Y | Y | 1463 | 1464 | gillnetting |
| 1-Sep | 62 | Osoyoos | SK | M | 52.2 | 1505.0 | N | Y | N | 1465 | 1466 | gillnetting |
| 1-Sep | 63 | Osoyoos | SK | M | 48.0 | 1082.0 | N | Y | N | 1467 | 1468 | gillnetting |
| 1-Sep | 64 | Osoyoos | SK | M | 50.2 | 1533.0 | N | Y | N | 1469 | 1470 | gillnetting |
| 1-Sep | 65 | Osoyoos | SK | M | 50.9 | 1416.0 | N | Y | N | 1471 | 1472 | gillnetting |
| 1-Sep | 66 | Osoyoos | SK | F | 47.4 | 1060.0 | N | Y | Y | 1473 | 1474 | gillnetting |
| 1-Sep | 67 | Osoyoos | SK | F | 47.0 | 1052.0 | N | Y | Y | 1475 | 1476 | gillnetting |
| 1-Sep | 68 | Osoyoos | SK | M | 49.0 | 1393.0 | N | Y | N | 1477 | 1478 | gillnetting |
| 1-Sep | 69 | Osoyoos | SK | M | 51.2 | 1326.0 | N | Y | N | 1479 | 1480 | gillnetting |
| 1-Sep | 70 | Osoyoos | SK | M | 47.9 | 1084.0 | N | Y | N | 1481 | 1482 | gillnetting |

# APPENDIX E
## Gillnetting set information

| Date 2004 | Gang mesh sizes (in) | General Lake location | Set depth from surface(m) | Soak start time | Soak end time | Soak soak (hrs) | Sockeye Male | Sockeye Female | Ratio of females | Chinook | Kokanee | Whitefish | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-Jul | 5, 4.5, 4.5, 4 | Osoyoos North end | 23 | 20:00 | 6:00 | 10 | 5 | 3 | 0.60 | 0 | 0 | 3 | |
| 17-Jul | 5, 4.5, 4.5, 4 | Osoyoos North end | 33-35 | 15:30 | 9:00 | 17.5 | 9 | 5 | 0.56 | 0 | 0 | 3 | |
| 20-Jul | 5, 4.5, 4.5, 5 | Osoyoos North end | 30 | 10:00 | 20:00 | 10 | 7 | 7 | 1.00 | 0 | 0 | 11 | |
| 24-Aug | 2.0, 2.5, 4.0, 4.5, 5.0 | Osoyoos North end | 30 | 21:30 | 6:30 | 9 | 0 | 1 | | 0 | 9 | 1 | 1RBT |
| 26-Aug | 2.0, 2.5, 4.0, 4.5, 5.0 | Osoyoos North end | 30 | 18:45 | 7:45 | 13 | 1 | 0 | | 0 | 21 | 0 | |
| 30-Aug | 1.5, 2.0, 2.5, 3.0, 4.0, 5.0 | Osoyoos North end | 32 | 21:20 | 9:00 | 11.3 | 9 | 2 | 0.22 | 1 | 16 | 2 | |
| 1-Sep | 1.0, 2.0, 2.5, 3.0, 4.0, 5.0 | Osoyoos North end | 30 | 20:00 | 9:00 | 13 | 14 | 5 | 0.36 | 0 | 33 | 4 | 1NSC |
| 15-Sep | 2.0, 2.5, 3, 4, 4.5,5 | Osoyoos North end | 33 | 22:00 | 10:00 | 12 | 16 | 5 | 0.31 | 0 | 8 | 14 | 1NSC, 1CP |
| 16-Sep | 2.5, 3, 4, 4.5, 5 | Osoyoos North end | 33 | 20:00 | 9:00 | 13 | 10 | 5 | 0.50 | 0 | 17 | 10 | nets drifted, 2NSC |
| | | | | | | ***Total*** | ***71*** | ***33*** | ***0.46*** | ***1*** | ***104*** | ***48*** | |

# APPENDIX F
## Beach seine and dead count sex ratio data

| Date | Seine size | Seine number | General location | Sweep length (m) | No. of escaped fish | Sockeye | | Ratio of females | Chinook | Kokanee | Other fish |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Male | Female | | | | |
| 21-Oct-04 | 200'x15' | 1 | natural | 50 | 20+ | 126 | 117 | 0.93 | | 22 | 8WF |
| 21-Oct-04 | 200'x15' | 2 | channel | 250 | 100+ | 172 | 95 | 0.55 | | 8 | |
| 21-Oct-04 | 200'x15' | 3 | channel | 300 | 100+ | 91 | 65 | 0.71 | | 1 | 1SU, 1WF |
| 21-Oct-04 | 200'x15' | 4 | natural | 50 | 20+ | 75 | 44 | 0.59 | | 5 | 1WF |
| 21-Oct-04 | 200'x15' | 5 | natural | 300 | 100+ | 92 | 51 | 0.55 | | 3 | |
| 20-Oct-04 | 200'x15' | 1 | channel | 20 | 10+ | 16 | 17 | 1.06 | | | |
| 20-Oct-04 | 200'x15' | 2 | channel | 20 | 10+ | 28 | 17 | 0.61 | | | |
| 20-Oct-04 | 200'x15' | 3 | channel | 20 | 20+ | 4 | 8 | 2.00 | | 1 | |
| 20-Oct-04 | 200'x15' | 4 | channel | 20 | 30+ | 24 | 30 | 1.25 | | | |
| 20-Oct-04 | 200'x15' | 5 | channel | 20 | 50+ | 5 | 11 | 2.20 | | | |
| 20-Oct-04 | 200'x15' | 6 | channel | 20 | 50+ | 3 | 6 | 2.00 | | | |
| 20-Oct-04 | 200'x15' | 7 | channel | 20 | 15 | 23 | 28 | 1.22 | | | |
| 20-Oct-04 | 200'x15' | 8 | channel | 20 | 20 | 17 | 15 | 0.88 | | 1 | |
| 20-Oct-04 | 200'x15' | 9 | natural | 40 | 50+ | 40 | 33 | 0.83 | | 4 | 2SU, 1CP |
| 20-Oct-04 | 200'x15' | 10 | natural | 20 | 100+ | 14 | 7 | 0.50 | | | |
| 19-Oct-04 | 200'x15' | 1 | natural | 100 | 20 | 243 | 142 | 0.58 | | 29 | 5WF |
| 19-Oct-04 | 200'x15' | 2 | channel | 300 | few | 179 | 65 | 0.36 | | 17 | 1WF |
| 19-Oct-04 | 200'x15' | 3 | channel | 100 | 75 | 56 | 17 | 0.30 | | 6 | |
| 19-Oct-04 | 200'x15' | 4 | channel | 500 | 250 | 82 | 27 | 0.33 | | 7 | |
| 19-Oct-04 | 200'x15' | 5 | natural | 150 | 100+ | 40 | 12 | 0.30 | | | |
| 19-Oct-04 | 200'x15' | 6 | channel | 500 | 100+ | 85 | 5 | 0.06 | | | |
| 18-Oct-04 | 200'x10' | 1 | channel | 50 | 20 | 141 | 99 | 0.70 | | 2 | 1WF |
| 18-Oct-04 | 200'x10' | 2 | channel | 300 | 100+ | 191 | 104 | 0.54 | 1 | | |
| 18-Oct-04 | 200'x10' | 3 | channel | 300 | 100+ | 66 | 41 | 0.62 | | 5 | 1WF, 2SU |
| 18-Oct-04 | 200'x10' | 4 | channel | 50 | 50+ | 124 | 111 | 0.90 | | 10 | |

| Date | Seine size | Seine number | General location | Sweep length (m) | No. of escaped fish | Sockeye | | Ratio of females | Chinook | Kokanee | Other fish |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Male | Female | | | | |
| 18-Oct-04 | 200'x10' | 5 | channel | 300 | 100+ | 233 | 112 | 0.48 | | 8 | |
| 18-Oct-04 | 200'x10' | 6 | channel | 200 | 250+ | 16 | 12 | 0.75 | | 1 | 1SU |
| 18-Oct-04 | 200'x10' | 7 | channel | 300 | 100+ | 39 | 18 | 0.46 | | | 1SU |
| 17-Oct-04 | 200'x10' | 1 | channel | 100 | few | 218 | 107 | 0.49 | | 2 | 1WF |
| 17-Oct-04 | 200'x10' | 2 | | 250 | lots | | | | | | |
| 17-Oct-04 | 200'x10' | 3 | natural | 100 | lots | 72 | 50 | 0.69 | | | 1SU |
| 17-Oct-04 | 200'x10' | 4 | natural | 50 | few | 33 | 17 | 0.52 | | 5 | 1WF |
| 17-Oct-04 | 200'x10' | 5 | natural | 100 | few | 90 | 34 | 0.38 | 1 | 2 | |
| 17-Oct-04 | 200'x10' | 6 | natural | | lots | 21 | 11 | 0.52 | | | 1CP |
| 17-Oct-04 | 200'x10' | 7 | natural | 150 | few | 176 | ? | | | | 1SHT |
| 16-Oct-04 | 200'x10' | 1 | channel | 200 | lots female | 286 | 150 | 0.52 | | | |
| 16-Oct-04 | 200'x10' | 2 | channel | 200 | lots female | 115 | 50 | 0.43 | | 2 | 2WF |
| 16-Oct-04 | 200'x10' | 3 | | 350 | 200+ | 129 | 81 | 0.63 | 1 | 2 | 8WF |
| 16-Oct-04 | 200'x10' | 4 | channel | 300 | 300+ | 225 | 213 | 0.95 | | 3 | 5WF, 2NSC, 19SU |
| 16-Oct-04 | 200'x10' | 5 | channel | 75 | 100 | 98 | 71 | 0.72 | | | |
| 15-Oct-04 | 200'x10' | 1 | natural | 200 | 50-60 | 296 | 93 | 0.31 | | 5 | |
| 15-Oct-04 | 200'x10' | 2 | channel | 400 | 200-300 | 357 | 169 | 0.47 | | | |
| 15-Oct-04 | 200'x10' | 3 | natural | 200 | 100 | 233 | 211 | 0.91 | | 10 | 5SU, 1CP |
| 15-Oct-04 | 200'x10' | 4 | natural | 200 | 150 | 70 | 74 | 1.06 | 1 | 12 | 2SU, 1WF, 1NSC |
| 15-Oct-04 | 200'x10' | 5 | natural | 200 | 100+ | 125 | 93 | 0.74 | | 4 | 1SU |
| 15-Oct-04 | 200'x10' | 6 | natural | 200 | 100+ | 138 | 160 | 1.16 | | 6 | 12SU, 5WF, 1CP |
| 14-Oct-04 | | | channel | 500 | 100+ | 156 | 93 | 0.60 | | 7 | |
| 14-Oct-04 | | | channel | 800 | 200+ | 350 | 258 | 0.74 | | 48 | 30SU, 1WF, 1CP, 1NSC |
| 14-Oct-04 | 200'x10' | 1 | channel | 50 | lots | 251 | 145 | 0.58 | | 5 | |
| 14-Oct-04 | 200'x10' | 2 | channel | 200 | few | 147 | 67 | 0.46 | | 3 | |
| 14-Oct-04 | | 1 | natural | lots | 21 | 21 | 9 | 0.43 | | 1 | |
| 14-Oct-04 | | 2 | natural | lots | 35 | 35 | 18 | 0.51 | | | |
| 14-Oct-04 | | 3 | natural | lots | 14 | 14 | 4 | 0.29 | | | |

| Date | Seine size | Seine number | General location | Sweep length (m) | No. of escaped fish | Sockeye | | Ratio of females | Chinook | Kokanee | Other fish |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Male | Female | | | | |
| 14-Oct-04 | | 4 | natural | lots | 21 | 21 | 11 | 0.52 | | | |
| 14-Oct-04 | | 5 | natural | lots | 33 | 33 | 10 | 0.30 | 1 | 1 | |
| 14-Oct-04 | | 6 | natural | lots | 50 | 50 | 37 | 0.74 | | 1 | 1CP |
| 13-Oct-04 | 75'x5' | 1 | natural | 100 | 100+ | 18 | 4 | 0.22 | 1 | 3 | 1WF |
| 13-Oct-04 | | | natural | 50 | 100+ | 313 | 234 | 0.75 | | 2 | |
| 13-Oct-04 | | | channel | 500 | 100+ | 708 | 381 | 0.54 | 1 | 6 | |
| 13-Oct-04 | | | channel | 400 | 150 | 490 | 319 | 0.65 | | 19 | 7WF, 3SU |
| 12-Oct-04 | 200'x10' | 1 | natural | 50 | 50+ | 334 | 154 | 0.46 | | 9 | 2WF, 1NSC |
| 12-Oct-04 | 200'x10' | 2 | channel | 200 | 200+ | 139 | 36 | 0.26 | | 3 | |
| 12-Oct-04 | | 1 | channel | 400 | lots | 84 | 26 | 0.31 | | 20 | |
| 12-Oct-04 | | 2 | channel | 65-100 | 75 | 33 | 0 | 0.00 | | 20 | |
| 12-Oct-04 | | 3 | channel | 100 | 50 | 399 | 244 | 0.61 | | 6 | 1WF, 1SU |
| 12-Oct-04 | | 4 | channel | 100 | 100+ | 61 | 36 | 0.59 | 1 | 2 | 4SU, 3WF |
| 10-Oct-04 | 75'x5' | | channel | 200 | 260 | 77 | 25 | 0.32 | | 4 | |
| 10-Oct-04 | 200'x10' | | channel | 200 | 250 | 206 | 84 | 0.41 | | 2 | 1WF |
| 10-Oct-04 | 200'x10' | | channel | 300 | 200 | 245 | 147 | 0.60 | | 6 | 2WF |
| 10-Oct-04 | 200'x10' | | channel | 50 | 152 | 404 | 221 | 0.55 | | 6 | 1SU |
| 9-Oct-04 | 200'x15' | 1 | channel | 250 | 85 | 263 | 147 | 0.56 | | 49 | |
| 9-Oct-04 | 200'x15' | 2 | channel | 250 | 100+ | 152 | 108 | 0.71 | | 21 | 5WF, 1SU |
| 9-Oct-04 | 200'x15' | 3 | | 150 | 200+ | 13 | 62 | 4.77 | | 1 | 3WF |
| 9-Oct-04 | 200'x15' | 4 | channel | 25 | 30 | 44 | 41 | 0.93 | | | |
| 9-Oct-04 | 200'x15' | 5 | channel | 50 | 20 | 73 | 44 | 0.60 | | | 9WF |
| 9-Oct-04 | 200'x15' | 6 | channel | 250 | 500-600 | 366 | 74 | 0.20 | | 3 | |
| 8-Oct-04 | 200'x10' | 1 | | 30 | 0 | 12 | 6 | 0.50 | | 1 | |
| 8-Oct-04 | 200'x10' | 2 | | 30 | 10 | 35 | 14 | 0.40 | | | |
| 8-Oct-04 | 200'x10' | 3 | | 50 | 0 | 89 | 26 | 0.29 | | | |
| 8-Oct-04 | 200'x10' | 4 | | 30 | lots 90 % | 4 | 4 | 1.00 | | | |
| 8-Oct-04 | 200'x10' | 5 | natural | 50 | | 52 | 6 | 0.12 | | 1 | |
| 8-Oct-04 | 200'x10' | 6 | natural | | | 49 | 15 | 0.31 | | 2 | 1NSC |

| Date | Seine size | Seine number | General location | Sweep length (m) | No. of escaped fish | Sockeye | | Ratio of females | Chinook | Kokanee | Other fish |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Male | Female | | | | |
| 8-Oct-04 | 200'x15' | 8 | channel | 150+ | 150+ | 561 | 284 | 0.51 | | 90 | 1SU, 1WF |
| 8-Oct-04 | 200'x15' | 1 | 400 m south of oasis | 60 | 100 | 36 | 16 | 0.44 | | 8 | |
| 8-Oct-04 | 200'x15' | 2 | natural | 150 | 200 | 52 | 39 | 0.75 | | 7 | 4WF, 1CP, 1SU |
| 8-Oct-04 | 200'x15' | 3 | natural | 100 | 20 | 119 | 129 | 1.08 | 1 | 16 | 7SU, 1WF, 1CP |
| 7-Oct-04 | 200'x10' | 1 | natural | 150 | 0 | 7 | 5 | 0.71 | | | |
| 7-Oct-04 | 200'x10' | 2 | natural | 150 | | 19 | 7 | 0.37 | | 2 | |
| 7-Oct-04 | 200'x10' | 3 | channel | | 10 | 11 | 14 | 1.27 | | | |
| 7-Oct-04 | 200'x10' | 4 | channel | 150 | | 1 | 3 | 3.00 | | | 5WF, 1CP |
| 7-Oct-04 | 200'x10' | 5 | | | | 31 | 21 | 0.68 | | | |
| 7-Oct-04 | 200'x15' | | channel | 200 | 82 | 217 | 45 | 0.21 | | 15 | |
| 7-Oct-04 | 200'x15' | | channel | 300 | 64 | 116 | 27 | 0.23 | | 30 | 7WF, 3SU, 1RBT |
| 7-Oct-04 | 200'x15' | | channel | 400 | 53 | 233 | 161 | 0.69 | | 109 | 4WF, 3RBT, 4SU |
| 6-Oct-04 | 200'x15' | | channel | 200 | 170 | 270 | 83 | 0.31 | | 4 | 1WF |
| 6-Oct-04 | 200'x15' | | channel | 100 | 24 | 42 | 7 | 0.17 | | 7 | 3SU |
| 6-Oct-04 | 200'x10' | 1 | natural | 50 | 1 | 10 | 5 | 0.50 | | | |
| 6-Oct-04 | 200'x10' | 2 | natural | 75 | lots | 30 | 3 | 0.10 | | | |
| 6-Oct-04 | 200'x10' | 3 | natural | | | 45 | 12 | 0.27 | | | |
| 6-Oct-04 | 200'x10' | 4 | natural | 50 | | 45 | 21 | 0.47 | | 2 | |
| 6-Oct-04 | 200'x10' | 5 | natural | | | 58 | 12 | 0.21 | | | |
| 6-Oct-04 | 200'x10' | 6 | natural | 100 | lots | 226 | 104 | 0.46 | | 5 | |
| 6-Oct-04 | 200'x10' | 7 | natural | 20 | 7 | 13 | 4 | 0.31 | | | |
| 6-Oct-04 | 200'x10' | 8 | channel | 200 | lots | 143 | 39 | 0.27 | | 6 | 1WF |
| | | | | | ***Average*** | ***125.56*** | ***69.06*** | ***0.66*** | | | |
| | | | | | ***Totals*** | ***12,933*** | ***7,044*** | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 22-Oct-04 | 3 person walks | | Dead count | 6km | unk=349 | 1,540 | 2,008 | 1.30 |