REPORT ON

NECHAKO RIVER WHITE STURGEON TAGGING PROJECT – 2005 DATA REPORT

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BC Ministry of Environment
4051 18th Avenue
Prince George, BC
V2N 1B3

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EXECUTIVE SUMMARY

As part of the Nechako River white sturgeon recovery process, the BC Ministry of Environment (MoE) initiated a white sturgeon radio telemetry program for the Nechako River in 2005. The purpose was to obtain information on white sturgeon behaviour and life history by radio-tagging greater numbers of Nechako River white sturgeon with radio tags that have increased longevity. The results from this program will assist on-going research and recovery efforts by increasing the understanding of fall and winter movements and identification of critical winter habitats. In addition, the movements of tagged mature sturgeon will facilitate future monitoring efforts to identify the timing and location of spawning.

Thirty-eight white sturgeon were captured in the Nechako River in 2005, including 1 juvenile, 8 sub-adults, and 29 adults. Thirty-three fish were captured in the Chilko-Sinkut overwintering area and five fish were captured in the downstream of Vanderhoof overwintering area. Thirty-one fish were surgically examined to determined sex and state of reproductive development. Of these, one female and eight males were classed as being in a more advanced reproductive state and may spawn in spring 2006. An internal radio transmitter was implanted in these nine fish to assist in monitoring potential spawning movement in 2006. At the client's request to deploy radio transmitter on all fish captured during the first two days of the tagging program and to become more selective later, an additional 18 of the 31 fish examined for sexual maturity were equipped with a radio transmitter. The study used two different tag code sets: Code set 1994 consisted of 44 active radio tags separated into seven frequencies while Code set 2000 consisted of two active radio tags with the same frequency (149.770) but different code numbers.

During the 2005 capture program, a total of 20 fish were recaptured from previous programs. Life history data for these fish was collected and is appended to this report. The sex of some previously captured fish differed on subsequent recapture dates. The most likely cause was misidentification due to lack of visible gonad development or the presence of abundant fluid in the ventral cavity during sexing.

In total, 61 radio tags have been installed in white sturgeon between 2001 and 2005. Of these, only 46 are still considered active according to their estimated operational life. A shed tag from 1997 (149.480-53) is still occasionally picked up by the receiver. The 46 active tags are separated into eight frequencies, with a range of 1 to 25 codes per frequency. Two are CART tags which switch between acoustic and radio modes of operation every five seconds.

Tracking of radio-tagged individuals was accomplished from boat and from shore. Tracking by boat was conducted in late October 2005 near the two known overwintering

areas (Km 116.2, Km 116.6, Km 117.0, and between Km 125.25 and Km 124.75). Thirty-seven tagged white sturgeon were located: 25 were located at Km 116.2 and 12 between Km 124.5 and 125.0. Only one new radio tagged fish (149.700-42) was not located during this tracking event. Shore-based tracking was conducted in mid March 2006 from access sites near the two known overwintering areas (Km 116.2 and Km 124.6). Thirty-three tagged white sturgeon were located: 25 were located at Km 116.2 and 8 were located at Km 124.6. Four new radio tagged fish (149.700-14, 35, 37, and 41) were not located during this tracking event. Tracking results indicated that when several radio-tagged fish were concentrated in one location, the more powerful tags coded out much more frequently than the weaker tags. As a result, tracking these fish is becoming more difficult and time consuming. To provide adequate reception coverage in future surveys when tracking is done by plane or helicopter, either multiple receivers will be necessary or some frequencies may have to be omitted. When tracking by boat, either more time will be required to scan for all frequencies, (i.e., several passes on some segments of river) or multiple receivers may be required.

During the 2005 program, depths at white sturgeon sample locations ranged from 1.5 to 8.3 m and visibility ranged from 2.5 to 4.1 m. In the Chilco Creek / Sinkut River overwintering area (Km 116.2), fine and coarse sand as well as gravel was encountered. Water velocities ranged from 0.10 m/s in the major pool to 0.51 m/s upstream and downstream of the major pool. Seven bathymetric profiles were generated for this area: an e-line (longitudinal transect conducted in the thalweg of the river) which had a maximum depth recorded of 4.9 m and six cross-section profiles separated from a “zigzag” line between both banks with a maximum depth of 6.8 m. In the overwintering area downstream of Vanderhoof (Km 124.7), the stream bottom upstream and downstream of the main pool was too compact to obtain substrate samples. Hard clay and sand were present in the middle of the large pool (Km 124.7). Water velocities ranged from 0.35 m/s in the major pool to 0.56 m/s upstream and downstream of the major pool. Ten bathymetric profiles were generated for this area: an e-line (longitudinal transect conducted in the thalweg of the river) which had a maximum recorded depth of 7.7 m and nine cross-section profiles separated from a “zigzag” line between both banks with a maximum depth of 8.1 m.

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Mr. J. Prince, Carrier-Sekani Tribal Council

The following employees of Golder Associates Ltd. contributed to the collection of data and/or the preparation of this report

C. McLeod – Project Director
L. Hildebrand – Senior Biologist, Editor
S. McKenzie – Senior Biologist, Editor
D. Hamilton – Project Manager
C. Stefura – Fisheries Biologist, Crew Leader
F. Audy – Fisheries Biologist, Principal Author
H. Van de Vosse – Word Processor

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1.0 INTRODUCTION

From 1995 to 1999, an intensive white sturgeon (*Acipenser transmontanus*) sampling program was conducted on the Nechako River (RL&L 2000a). That program extensively sampled the Nechako River to collect information on white sturgeon life history, distribution, behaviour, habitat use, reproductive characteristics, population characteristics, and genetic status. The program identified an almost complete recruitment failure of the Nechako white sturgeon population. The study also provided genetic material that resulted in the classification of the Nechako River population as genetically distinct from the upper Fraser River population (RL&L 2000a). In 2003, white sturgeon were listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered and the species is currently under consideration for Schedule 1 listing under the Species at Risk Act. A recovery planning process has been initiated, and the Nechako River White Sturgeon Recovery Team has prepared a recovery plan (NWSRI 2004) and is implementing recovery actions as prioritized in the plan.

In 2005, the BC Ministry of Environment (MoE) contracted Golder Associates Ltd. (Golder) to conduct a program to capture and radio tag Nechako River white sturgeon. The aim of the program was to increase the number of radio-tagged white sturgeon in the Nechako River and through the use of tags with a longer operating life than tags formerly used, provide long-term data to further ongoing population assessment, monitoring and research as a priority recovery activity:

- increasing information on fall and winter movements and identifying critical winter habitats; and
- using the movements of tagged mature sturgeon to facilitate future monitoring of the timing and location of spawning.

This report outlines the methods used and presents the results from the field sessions undertaken in September and October 2005 and March 2006.

2.0 METHODOLOGY

The project was divided into three phases: capturing and tagging white sturgeon, monitoring tagged sturgeon, and defining and mapping habitat characteristics of the major overwintering locations. The capture and tagging methods used are briefly summarized in this report; a more detailed description of methods is provided in RL&L (1997).

2.1 Capture and Tagging

Setlines and angling were the two capture methods used to capture white sturgeon. Fish handling was done onboard a boat while tethered to shore. Four tagging and/or marking methods were used: Floy T-bar anchor tags, Passive Integrated Transponder (PIT) tags, removal of a section of the pectoral fin ray, and radio tags.

2.1.1 Capture Methods

Set Lines

Two set line configurations were used during the present study: long lines and medium lines. Long lines were deployed in sections of river characterized by slower velocities and laminar flow. Full circle hook sizes used were 7 (12/0), 5 (14/0), and 3 (16/0) to facilitate the capture of a broad size-range of sturgeon. Ten sharpened hooks (barbs removed) of each size and baited with salmon (sockeye) flesh were placed in random order on each line. To reduce the possibility of losing a set line, a tether line was used to secure one end of the set line to shore with the other end attached to an anchor and buoy line.

Medium lines (40 m in length) were deployed in smaller backwater habitats. These set lines were equipped with eight hooks; two hooks of one size; three hooks of a second size, and three hooks of the remaining size. Medium lines were employed more frequently than other long line due to the physical characteristics of sample locations typically encountered in the Nechako River study area.

Water temperature, depth, visibility, number of hooks, and set duration were recorded for each set. Several stations were sampled repetitively. Catch-per-unit-effort (CPUE = no. fish/100 hook hours) data were generated for each set and all capture information was recorded on white sturgeon set line forms (Appendix A, Table A1).

Angling

Angling for white sturgeon was conducted using a halibut fishing rod, 27 to 45 kg test braided nylon or monofilament line, and a bait-casting reel. A single shank stainless steel hook was baited with either pieces of salmon (sockeye) flesh or salmon roe. Angling was conducted either from a boat or from the shore. All data were recorded on white sturgeon angling forms (Appendix A, Table A2) and CPUE data (no. fish/hook hour) were generated for each sample location.

2.1.2 Fish Handling and Life-History Assessment

Fish Handling

For processing, the fish were guided into a stretcher constructed of a waterproof plastic laminate material. The stretcher was then raised into the boat. Fresh river water was added to the stretcher, and replenished as required during the processing period. Following processing, the fish was returned to the water and released once normal respiration, orientation, and swimming behaviour were observed by the study team. All white sturgeon captured and sampled for life history information were released in good health and displayed normal respiration and swimming behaviour.

Life-History Data Collection

White sturgeon were measured for fork length (FL), total length (TL), post-orbital length (tip of snout to posterior margin of orbit; PO), and pre-opercular length (tip of snout to posterior margin of operculum; SL), to the nearest 0.5 cm. Girth was measured behind the pectoral fins to the nearest 0.5 cm. Weight was determined using a 135 kg capacity spring scale accurate to ± 2%.

Surgery was performed in the abdominal area of white sturgeon, near the midventral line, three to four ventral scutes anterior to the insertion point of the pelvic fin in the manner described in RL&L (1997). An otoscope equipped with a veterinary head and speculum was inserted into the incision to locate and examine the gonads.

Sex and maturity were determined using the description provided in Appendix A, Table A3. Sex and maturity information was collected to assess the reproductive potential of the population, the sex ratio within the population, and the seasonal movements of the different maturity cohorts. For some females in an advanced state of sexual maturity, a small sample of the ovary was biopsied and preserved for more detailed assessments of gonadal development. Black eggs obtained from one female were measured and preserved in 99% denatured ethanol for future reference.

Analysis of the life history data was outside the scope of the study.

Genetic Samples

A small section (1 cm^2) of the distal end of the pectoral fin was removed, cut into thin sections using surgical scissors, and preserved in an appropriately labeled vial containing 99% denatured ethanol. These DNA samples along with an electronic copy of associated data, were forwarded to MoE for archival and subsequent analysis.

Photographs

Photographs were taken for most fish using a digital camera. The photographs included fish measurements, individual characteristics, general view of fish and working area, as well as fish release. All photos were sorted in a folder identified by the fish PIT tag. A CD with these photos was forwarded to MoE for reference.

2.1.3 Tagging Methods

All captured white sturgeon were examined for indications of previous capture (T-anchor tags, fin clips, PIT tags, and radio tags). All new fish processed by the study team and recaptured fish with missing external tags were marked with a uniquely numbered pink Floy T-anchor tag, manufactured by Floy Tag Manufacturing Inc. and supplied by MoE. Prior to insertion through the base of the dorsal fin, each tag was immersed in an antiseptic (i.e. Germaphine).

A 5 mm section from the leading left pectoral fin ray for all new fish and from the right pectoral fin ray for some of the recaptures was removed for ageing purposes and to provide a secondary external identification mark. If any bleeding occurred, the area was swabbed with an antiseptic (i.e. Betadyne solution) and Vetbond™ (a tissue adhesive) was applied to seal the wound. These samples were forwarded to MoE for ageing and archiving.

All new captured sturgeon were implanted with 125 kHz passive integrated transponder (PIT) tags manufactured by Biomark Inc. The PIT tags were injected with a MK-5 implanter with an attached cannulated needle specific to small PIT tags (Destron TX 1411L) and both were sterilized with Germaphine. The tags were implanted subcutaneously at the base of the skull on the dorsal side of the fish. An AVID Power Tracker II Reader was used to identify and record the unique digital code of each implanted PIT tag.

At the beginning of the field session, all fish captured were equipped with a radio transmitter; near the end of the field session, tagging was more selective. Two transmitter types were implanted.

- The MCFT-3L microprocessor coded radio transmitter measured 16 x 73 mm and weighed 11 g in water. MoE provided 25 new Lotek MCFT-3L coded microprocessor tags (149.700-20 to 43) as well as two older tags on a different frequency (148.400-6 and 8).
- The MCFT-3A microprocessor coded radio transmitter (149.700-14) measured 16 x 51 mm and weighed 6.2 g in water. This tag had been stored by MoE for approximately four years, but was still functional when applied.

MoE also provided six additional Lotek tags separated into three frequencies: 148.420 (1; MCFT-3L), 149.480 (2; MCFT-7D), and 149.800 (3; CART tags). The 148.420 series tags were left over from a Carrier Sekanni Tribal Council (CSTC) white sturgeon tagging project in 2002 and 2004. The 149.480 series tags were previously used during a bull trout study and had been shed and subsequently recovered. These tags were estimated to have three years operational life remaining. The 149.800 series were CART tags left over from the Stuart Lake and Trembleur Lake white sturgeon program in 2004.

Transmitters were surgically implanted through the same incision used to identify sexual maturity. A cannula was inserted through the abdominal wall approximately 2 cm posterior to the incision, and the tip was brought out through the incision. The radio tag antenna was inserted in the cannula and the radio tag was inserted into the abdominal cavity. The cannula was then removed and the incision was ready for suturing. Once completed, the antennae was positioned under ventral surface and anterior to the urogenital duct.

2.2 Tracking Methods

Tracking of radio-tagged individuals was accomplished from boat and from shore. Radio tracking by boat was conducted in late October 2005. Shore-based tracking was conducted in mid March 2006 from access sites near the two known overwintering areas (Km 116.2 and Km 124.6). For both boat and shore surveys, a four element Yagi antenna and a Lotek scanning receiver (Model SRX 400) was used to established the location of radio-tagged white sturgeon.

2.3 Habitat Characteristics of Major Overwintering Locations

In all areas sampled for white sturgeon, general descriptions of habitat, including depth, visibility, and water temperature were obtained. Capture depths for individual fish were

estimated using a Model X-65 Lowrance depth sounder. Water clarity was determined using a Secchi disk and water temperature was recorded with a hand-held electronic thermometer (±0.1^{o}C).

Additional habitat data were collected from selected areas used by radio-tagged fish in known wintering habitats (Km116 and Km125). Data substrate, velocity, and depth (from bathymetric transects) were collected in addition to UTM coordinates for mapping purposes. Substrate and velocity data were taken at point measurements located upstream, at the center, and downstream of each overwintering habitat. Bathymetric cross-section profiles were generated for each area by recording an e-line (transect conducted in the thalweg of a river) and then a "zigzag" line between both banks while moving back to the start of the e-line.

Near-surface water velocities (measured at 1.5 m depth) were obtained using a Swoffer Model 2100 Current Velocity Meter attached to a wading rod. Bed material was assessed visually from samples obtained with a Ponar type grab sampler. Bathymetry transects were conducted using a Garmin 168 GPS Mapper (combination sonar and GPS). Data was transferred onto a laptop while in the field, and transferred into an Excel file once at the office.

3.0 RESULTS

3.1 Capture and Tagging of White Sturgeon

3.1.1 Capture of White Sturgeon

Sampling was focused in the following areas known to be used by white sturgeon in the Nechako River:

- upstream of Keillor's Pointe (Km 111.2);
- between Chilco Creek and Sinkut River (Km 114.9 to 117.3); and
- immediately downstream of Vanderhoof (Km 124.6 to 132.3).

In the present study 38 white sturgeon were captured in the study area. The majority (94.7%, *n* = 36) were captured by set lines, with the remainder (5.3%, *n* = 2) caught by angling (Appendix A, Tables A1 to A2). Two white sturgeon were hooked, but escaped while retrieving the sampling gear.

In total, 9002.0 hook-hours of set line sample effort was expended at sites distributed throughout the study area (Table 3.1). Sampling effort differed per area with most of the effort expended between Chilko Creek and Sinkut River (59.0%; 5312.4 hook-hours) and downstream of Vanderhoof (37.2%; 3348.9 hook-hours). Catch rates downstream of Vanderhoof (0.1 white sturgeon/100 hook-hours) were substantially lower than between Chilko Creek and Sinkut River (0.6 white sturgeon/100 hook-hours).

Table 3.1 Summary of total catch, catch rate (CPUE= No. fish/100 hook-hours), and size range for white sturgeon captured by set line in the Nechako River, 2005.

River Km	Area	Date[1]	Sample Effort (hook-hours)	Catch	CPUE	Size Range[2] (cm)
111.2	Keillors's Pointe	17-19 Sep	340.7	0	0.0	-
114.9 – 117.3	Chilko Ck. – Sinkut R.	14-19 Sep	5312.4	32	0.6	74.0 – 212.5
124.7 – 132.3	Downstream of Vanderhoof	13-16 Sep	3348.9	4	0.1	86.0 – 138.0
TOTAL			**9002.0**	**36**	**0.4**	**74.0 – 212.5**

[1]Area may not have been continuously sampled during dates shown. Refer to Appendix A, Table A1.
[2] Size-range in fork length.

Angling captured two fish in 12.4 hook-hours of effort. The majority (69.4%) of effort was expended downstream of Vanderhoof (Table 3.2).

Table 3.2 Summary of total catch, catch rate (CPUE= No. fish/hook-hours), and size range for white sturgeon captured by angling in the Nechako River, 2005.

River Km	Area	Date[1]	Sample Effort (hook-hours)	Catch	CPUE	Size Range[2] (cm)
116.2 – 117.0	Chilko Ck. – Sinkut R.	16-19 Sep	3.8	1	0.3	218.0
124.6 – 124.7	Downstream of Vanderhoof	13-17 Sep	8.6	1	0.1	148.0
TOTAL			**12.4**	**2**	**0.2**	**148.0 – 218.0**

[1]Area may not have been continuously sampled during dates shown. Refer to Appendix A, Table A2.
[2]Size-range in fork length.

3.1.2 Life-History Data

Lengths

Length data was collected for all 38 white sturgeon captured in 2005 (Appendix C, Table C1). These fish ranged in fork length from 74.0 to 218.0 cm and in weight from 2.7 to 73.0 kg. Life history data was not collected from one white sturgeon that escaped prior to processing.

For the purposes of this study and as defined in RL&L (1996), juvenile, sub-adult, and adult classifications referred to in this document represent fish less than 100 cm in total length (TL), between 100 and 150 cm TL, and greater than 150 cm TL, respectively. As such, the only juvenile encountered during the 2005 tagging program was located in the Sinkut River area. Eight sub-adults and 29 adults were captured; 33 fish were located in the Sinkut River area (Figure 3.1).

Overall, white sturgeon greater than 150 cm TL were the most frequent (76.3% of the catch) size-class recorded in the study area. The composition of size-classes per sampled area and the spatial length-frequency distributions of these fish are illustrated in Figures 3.1 and 3.2, respectively.

Sex and Maturity

Surgical examinations to determine sex and state of reproductive development were performed on 31 (82%) of the white sturgeon captured in 2005 (Appendix C, Table C2). Of these fish, two were assigned maturity classifications based on size (i.e., due to the presence of fluid in the ventral cavity that prevented observation of the gonads).

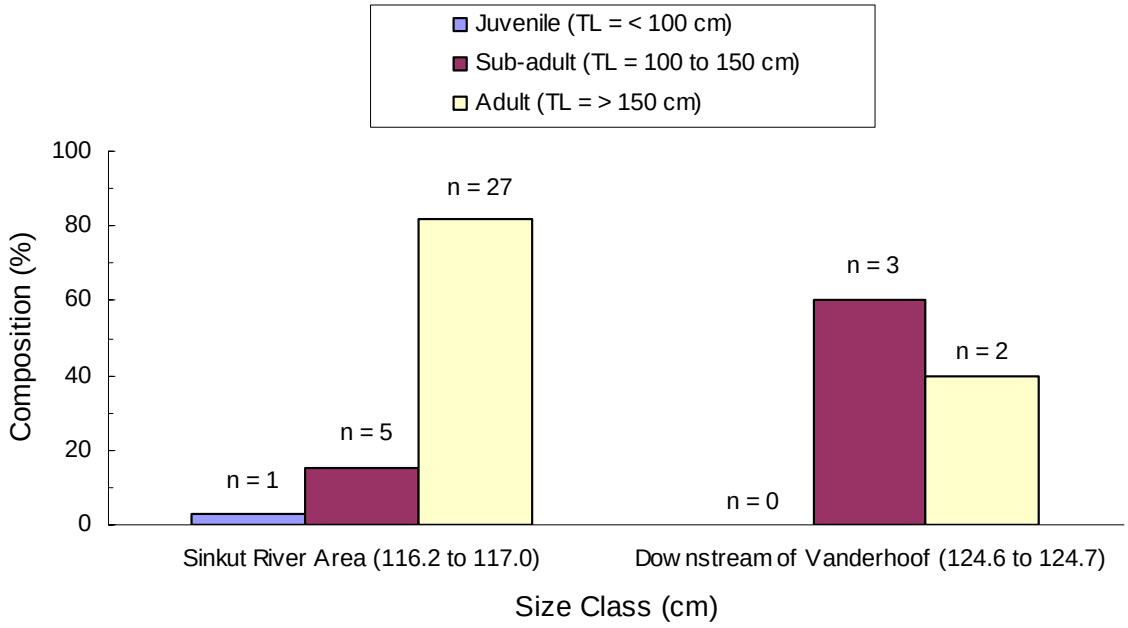

Figure 3.1 Percent composition of juvenile, sub-adult, and adult white sturgeon (based on total length) captured in the Nechako River, 2005.

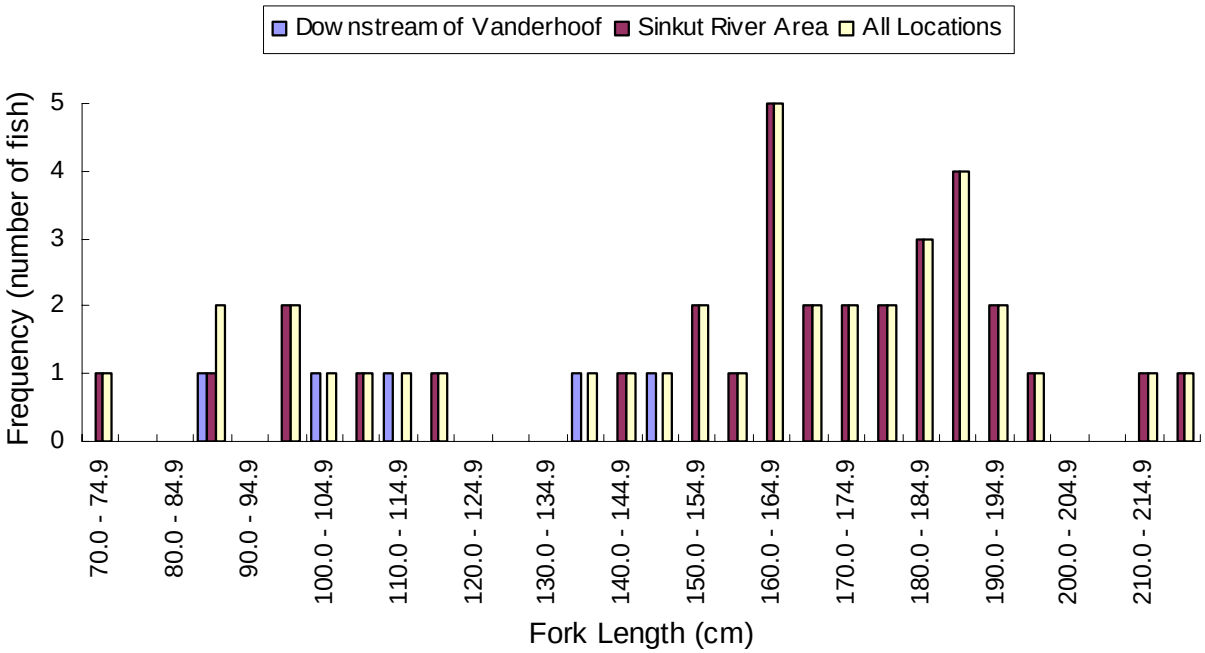

Figure 3.2 Spatial length frequency distribution of white sturgeon (based on fork length) captured in the Nechako River, 2005.

The sex ratio of the 29 sexed white sturgeon was 18 males:11 females (1.6:1). These fish ranged in fork length from 86.0 to 218.0 cm. The majority (69%) of these fish were considered to be in early stages of reproductive development and were not expected to spawn within the next two years. Eight male and one female white sturgeon were classed as being in a more advanced reproductive state and could potentially spawn in spring 2006. A radio transmitter was implanted in each of these fish to assist in monitoring potential spawning movements.

Of the 11 ovaries assessed for development stage in the Nechako River, 1 (9%) was non-reproductive (Code 11), 9 (82%) were pre-vitellogenic (Code 12), and 1 (9%) was late vitellogenic (Code 14). Of the 18 testes assessed for development stage in the Nechako River, 2 (11%) were non-reproductive (Code 01), 2 (11%) were maturing (Code 02), 6 (33%) were early reproductive (Code 03), and 8 (44%) were late reproductive (Code 04; Figure 3.3 and Appendix C, Table C2). A description of the sexual maturity codes used for white sturgeon in the present study is provided in Appendix A, Table A3.

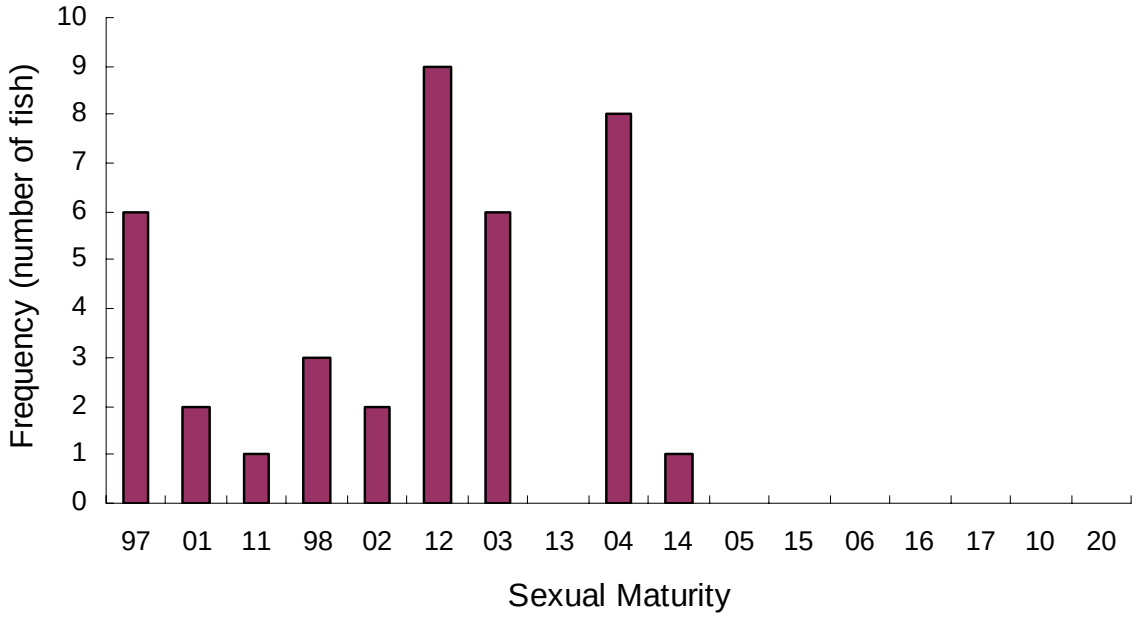

Figure 3.3 Frequency distribution of white sturgeon (based on sexual maturity) captured in the Nechako River, 2005.

Genetic Samples

Tissue samples were collected from Nechako River white sturgeon for the purpose of DNA analysis (Appendix C, Table C3). These samples were forwarded to MoE, Prince

George, BC. Out of the 19 DNA samples collected, 18 were from fish not previously captured and one was from a recapture (previously captured by Golder in 2001).

3.1.3 Tagging

Thirty-eight white sturgeon were captured in the Nechako River in 2005 (Table 3.3). New Floy T-anchor tags were applied to 32 white sturgeon (84.2% of all fish captured). A pectoral fin section was collected from 22 white sturgeon for ageing and to provide a secondary external mark; 18 left pectoral fins were obtained from newly captured fish and four right pectoral fins from recaptured fish. (Appendix C, Table C3). PIT tags were applied to the 18 new captures. Radio transmitters were implanted into 27 white sturgeon (both new captures and recaptures).

Table 3.3 Summary of mark and recapture events for white sturgeon marked with conventional tags in the Nechako River, 2005.

River Km	Area	Number Caught	Number Tagged				Number Recaptured	
			Floy	Fin Ray	PIT	Radio	No.	%
114.9 – 117.3	Chilko Ck. – Sinkut R.	33	27	19	15	22	18	47.4
124.6 – 132.3	Downstream of Vanderhoof	5	5	3	3	5	2	5.3
TOTAL		**38**	**32**	**22**	**18**	**27**	**20**	**52.6**

There were 20 recapture events during the 2005 program (Table 3.3). Fourteen of the recaptured fish had lost their original Dart/Floy tags and required application of a new Floy tag. Approximately 50% of the catch in 2005 represented fish previously sampled by R.L.& L. Environmental Services Ltd. (RL&L), Golder, or Carrier Sekanni Tribal Council (CSTC; Appendix C, Tables C1 and C4). A summary of information on the 20 recaptured white sturgeon is provided for each fish below.

Frequency 149.700, Code 20; Floy Tag: Pink 5026; PIT Tag: 424D3B7366

This individual was originally captured and tagged (PIT tag and red Floy #2029) in the Sinkut River area (Km 115.9) on 23 September 2004. However, when recaptured downstream of Neuco Creek (Km 125.0) on 14 September 2005, the Floy tag was missing but the PIT tag was present. A radio transmitter and a new Floy tag were applied in 2005. This fish was initially classed as a juvenile based on size (Table 3.4). Surgery conducted in 2005 indicated this fish was a sub-adult, non-reproductive male.

Table 3.4 Recapture information for white sturgeon (PIT #424D3B7366).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
CSTC	23 Sep 04	115.9	820	940	230	300	3.084	98	13
Golder 05	14 Sep 05	125.0	860	1000	240	310	3.6	01	(14)

[1]CSTC = LTB CSTC sturgeon 1996-2004 database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 14; Floy Tag: Green 46; PIT Tag: 424F201F7F

This individual was originally captured and tagged (PIT tag and green Floy #46) by the CSTC in the Fraser River (Km 808.4), a few kilometers upstream of the confluence with the Nechako River, on 29 August 2001. When recaptured in the Sinkut River area (Km 116.8) on 16 September 2005, both Floy tag and PIT tag were still present. A radio transmitter was applied in 2005. This fish was classed as a juvenile based on size (Table 3.5). Surgical examination was conducted in 2005, but the abundance of fluid in the ventral cavity prevented identification of sexual maturity.

Table 3.5 Recapture information for white sturgeon (PIT #424F201F7F).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
CSTC	29 Aug 01	Fraser 808.4	660	760	185	220	1.26	98	8
Golder 05	16 Sep 05	116.8	880	1025	230	300	4.1	98	(12)

[1]CSTC = LTB CSTC sturgeon 1996-2004 database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 40; Floy Tag: Pink 5047; PIT Tag: 7F7D775A36

This individual was originally captured and tagged (PIT tag, orange Floy #4510) between the Finmoore boat launch and Stuart River (Km 93.1) on 10 June 1995. When recaptured in the Sinkut River area (Km 115.2) on 22 June 1998, the Floy tag was missing so a new Floy tag (Yellow #405) was applied. When recaptured again on 17 September 2005 downstream of Neuco Creek (Km 124.6) the second Floy tag was missing, but the PIT tag was present. A radio transmitter and a new Floy tag were applied in 2005.This fish was classed as a juvenile based on size in 1995, a maturing male in 1998, and a late reproductive male in 2005 (Table 3.6).

Table 3.6 Recapture information for white sturgeon (Pit #7F7D775A36).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	10 Jun 95	93.1	1140	1320	295	440	10.886	98	29
RL&L	22 Jun 98	115.2	1230	1420	320	455	14.074	02	(32)
Golder 05	17 Sep 05	124.6	1480	1690	385	580	24.5	04	(39)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 25; Floy Tag: Pink 5033; PIT Tag: 7F7B0B200A

This individual was originally captured and tagged (PIT tag and yellow Floy #24) in the Sinkut River area (Km 116.2) on 16 September 1995. When recaptured at the same location on 15 September 2005, the Floy tag was missing but the PIT tag was present. A radio transmitter and a new Floy tag were applied in 2005. This fish was classed as a maturing male in 1995 and a late reproductive male in 2005 (Table 3.7).

Table 3.7 Recapture information for white sturgeon (Pit #7F7B0B200A).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	16 Sep 95	116.2	1290	1490	305	505	18.16	02	29
Golder 05	15 Sep 05	116.2	1540	1785	395	600	27.2	04	(39)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 32; Floy Tag: Yellow 1321; PIT Tag: 7F7B0C6725

This individual was originally captured and tagged (PIT tag and yellow Floy #40) downstream of Neuco Creek (Km 124.7) on 17 September 1997. It was recaptured in the Sinkut River area (Km 116.2) on 1 September 1998. (both tags intact) and again downstream of Neuco Creek (Km 125.2) on 25 September 2001 (Floy tag missing; new yellow Floy #1321 applied). On 16 September 2005, this fish was caught in the Sinkut River area (Km 116.8) and the Floy tag and the PIT tag were still present. A radio transmitter was applied in 2005. This fish was classed as a maturing male in 1997 and a late reproductive male in 2005 (Table 3.8).

Table 3.8 Recapture information for white sturgeon (Pit #7F7B0C6725).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	17 Sep 97	124.7	1295	1480	310	455	16.8	02	36
RL&L	1 Sep 98	116.2	1375	1540	325	510	18.6	02	(37)
Golder	25 Sep 01	125.2	1510	1710	360	550	24.5	97	(40)
Golder 05	16 Sep 05	116.8	1615	1825	395	585	29.0	04	(44)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency (na), Code (na); Floy Tag: Pink 5045; PIT Tag: 4124684A2D

This individual was originally captured and tagged (PIT tag and yellow Floy #1301) in the Sinkut River area (Km 116.2) on 21 September 2001. However, when recaptured in the Sinkut River area (Km 115.3) on 17 September 2005 the Floy tag was missing. A new Floy tag was applied but a radio tag was not. In 2001,this fish was classed as an adult based on size (Table 3.9). Surgery conducted in 2005 identified this fish as a pre-vitellogenic female.

Table 3.9 Recapture information for white sturgeon (Pit #4124684A2D).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
Golder	21 Sep 01	116.2	1495	1675	350	535	21.4	97	na
Golder 05	17 Sep 05	115.3	1630	1825	390	600	28.1	12	na

[1]Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 26; Floy Tag: Pink 5032; PIT Tag: 4139136C2A

This individual was originally captured and tagged (PIT tag and yellow Floy #1333) downstream of Neuco Creek (Km 125.2) on 28 September 2001. When recaptured in the Sinkut River area (Km 116.2) on 15 September 2005, the Floy tag was missing. A radio transmitter and a new Floy tag were applied in 2005. In 2001,this fish was classed as an adult based on size (Table 3.10). Surgery conducted in 2005, identified this fish as a non-reproductive female.

Table 3.10 Recapture information for white sturgeon (Pit #4139136C2A).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
Golder	28 Sep 01	125.2	1475	1675	370	590	24.9	97	na
Golder 05	15 Sep 05	116.2	1605	1830	415	635	30.4	11	na

[1]Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 30; Floy Tag: Yellow 1335; PIT Tag: 4124714367

This individual was originally captured and tagged (PIT tag and yellow Floy #1335) in the Sinkut River area (Km 115.1) on 30 September 2001. When recaptured in the Sinkut River area (Km 117.3) on 16 September 2005, both tags were present. A radio transmitter was applied in 2005. In 2001,this fish was classed as an adult based on size (Table 3.11). Surgery conducted in 2005 identified this fish as a late reproductive male.

Table 3.11 Recapture information for white sturgeon (Pit #4124714367).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
Golder	30 Sep 01	115.1	1560	1740	400	610	29.0	97	na
Golder 05	16 Sep 05	117.3	1635	1835	415	655	34.0	04	na

[1]Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency (na), Code (na); Floy Tag: Pink 5042; PIT Tag: 7F7B0C4C09

This individual was originally captured and tagged (PIT tag and yellow Floy #350) downstream of Neuco Creek (Km 124.7) on 7 September 1998. When recaptured in the same area (Km 125.0) on 9 September 1999, the Floy tag was missing and a new tag . (yellow #1472) was applied. The fish was next captured in the Sinkut River area (Km 116.2) on 1 October 2001 and again in the Sinkut River area (Km 116.8) on 17 September 2005. At the last capture, the second Floy tag was missing so a new Floy tag was applied. This fish has been classed as an early reproductive male each time it has been examined (Table 3.12).

Table 3.12 Recapture information for white sturgeon (Pit #7F7B0C4C09).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	7 Sep 98	124.7	1430	1590	370	560	21.8	03	39
RL&L	9 Sep 99	125.0	1460	1630	375	560	23.1	98	(40)
Golder	1 Oct 01	116.2	1515	1690	395	610	26.8	03	(42)
Golder 05	17 Sep 05	116.8	1650	1860	450	655	34.9	03	(46)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.

[2]For a description of maturity codes, see Appendix A, Table A3.

[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 23; Floy Tag: Pink 5030; PIT Tag: 7F7B0C4E1D

This individual was originally captured and tagged (PIT tag and yellow Floy #13) downstream of Neuco Creek (Km 124.5) on 15 September 1995. However, when recaptured in the Sinkut River area (Km 116.2) on 4 September 1998, the Floy tag was missing and a new tag (yellow #326) was applied. When recaptured in the same location on 4 October 2001, the Floy tag was missing and a new tag (Yellow #1342) applied. This fish was recaptured in the Sinkut River area (Km 116.8) on 15 September 2005; the external tag was missing again but the PIT tag was present. A radio transmitter and a new Floy tag were applied in 2005. Each time this fish was captured, the sexual maturity classification was different: from an early reproductive male in 1995, to a female of unknown maturity in 1998, to an adult of unknown gender in 2001, and then to a pre-vitellogenic female in 2005 (Table 3.13). The latter classification is considered accurate.

Table 3.13 Recapture information for white sturgeon (Pit #7F7B0C4E1D).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	15 Sep 95	124.5	1625	1900	425	660	35.866	03	43
RL&L	4 Sep 98	116.2	1680	1960	450	635	32.7	20	(46)
Golder	4 Oct 01	116.2	1675	1930	450	635	31.8	97	(49)
Golder 05	15 Sep 05	116.8	1720	2000	465	670	35.8	12	(53)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 148.420, Code 14; Tag: Red 2076; PIT Tag: 5028040133

This individual was originally captured and tagged (PIT tag, red Floy #2076, and radio transmitter frequency 148.420, code 14) in Stuart Lake on 27 September 2004. The missing left pectoral fin was then identified as a possible birth defect. When recaptured in the Sinkut River area (Km 115.1) on 17 September 2005, all tags were present. Information collected from this fish at capture was limited to length and weight measurements to reduce handling time as the fish was considered to be in poor shape (missing left pectoral fin, deformed nares, and damage to barbels) even if none of these were due to recent events. In 2004, this fish was identified as a pre-vitellogenic female (Table 3.14). The sexual maturity of this fish was not assessed in 2005 (classed as an adult based on size).

Table 3.14 Recapture information for white sturgeon (Pit #5028040133).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
CSTC	27 Sep 04	Stuart Lake	1790	2040	460	840	57.1	12	na
Golder 05	17 Sep 05	115.1	1765	2025	465	715	44.5	97	na

[1]CSTC = LTB CSTC sturgeon 1996-2004 database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 33; Floy Tag: Pink 5037; PIT Tag: 7F7D7C115E

This individual was originally captured and tagged (PIT tag and yellow Floy #46) in the Sinkut River area (Km 116.2) on 18 September 1997. However, when recaptured in the same location (Km 116.8) on 16 September 2005, the Floy tag was missing. A radio transmitter and a new Floy tag were applied in 2005. In 1997, this fish was classed as an adult based on size (Table 3.15). Surgical examination in 2005 identified this fish as a late reproductive male.

Table 3.15 Recapture information for white sturgeon (Pit #7F7D7C115E).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	18 Sep 97	116.2	1675	1905	435	635	36.8	97	37
Golder 05	16 Sep 05	116.8	1815	2080	475	715	46.3	04	(45)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency (na), Code (na); Dart Tag: Yellow 31; PIT Tag: 7F7D7D4F7C

This individual was originally captured and tagged internally (PIT tag, yellow Floy #31, and radio transmitter frequency 149.560; code 111) in the Sinkut River area (Km 116.2) on 19 September 1995. However, when recaptured in the same area (Km 117.3) on 18 September 2005, the external radio transmitter was missing but the dart tag and the PIT tag were present. No new tags were applied. This fish was classed as a pre-vitellogenic female at both capture events (Table 3.16).

Table 3.16 Recapture information for white sturgeon (Pit #7F7D7D4F7C).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	19 Sep 95	116.2	1480	1720	370	550	24.97	12	40
Golder 05	18 Sep 05	117.3	1815	2090	465	680	42.2	12	(50)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 148.400, Code 8; Dart Tag: Yellow 93; PIT Tag: 7F7B0C6864

This individual was originally captured and tagged (PIT tag, yellow Floy # 93, and radio transmitter frequency 149.740 code 105) downstream of Hutchison Creek (Km 72.6) on 16 September 1996. However, when recaptured in the Sinkut River area (Km 116.2) on 19 September 2005, the radio transmitter was missing but the dart tag and PIT tag were present. A new radio transmitter was applied in 2005. This fish was classed as a maturing male in 1996 and an early reproductive male in 2005 (Table 3.17).

Table 3.17 Recapture information for white sturgeon (Pit #7F7B0C6864).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	16 Sep 96	72.6	1590	1800	405	615	30.9	02	45
Golder 05	19 Sep 05	116.2	1860	2090	490	750	46.7	03	(54)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 34; Floy Tag: Pink 5038; PIT Tag: 7F7B033461

This individual was originally captured and tagged (PIT and yellow Floy #403) near Cluculz Creek (Km 96.4) on 19 June 1998. When recaptured near the Keillor's Point area (Km 111.2) on 20 September 2001, the external tag was missing and a new tag (Yellow #1499) was applied. When next captured in the Sinkut River area (Km 116.2) on 16 September 2005, the second Floy tag was missing but the PIT tag was present. A radio transmitter and a new Floy tag were applied in 2005. The sexual maturity of this fish was classed as an early reproductive male in both 1998 and 2001 and as a late reproductive male in 2005 (Table 3.18).

Table 3.18 Recapture information for white sturgeon (Pit #7F7B033461).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	19 Jun 98	96.4	1580	1780	400	600	29.51	03	41
Golder	20 Sep 01	111.2	1715	1940	440	700	40.8	03	(44)
Golder 05	16 Sep 05	116.2	1850	2105	475	695	44.9	04	(48)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder = Golder sturgeon data 2000 to present database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 39; Floy Tag: Pink 5044; PIT Tag: 7F7B04052A

This individual was originally captured and tagged (PIT and yellow Floy #26) in the Sinkut River area (Km 115.2) on 16 September 1995. When recaptured near the same location (Km 116.2) on 17 September 2005, the Floy tag was missing. A radio transmitter and a new Floy tag were applied in 2005. This fish has been classed as an early reproductive male on each capture (Table 3.19).

Table 3.19 Recapture information for white sturgeon (Pit #7F7B04052A).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	16 Sep 95	115.2	1530	1870	385	650	35.866	03	40
Golder 05	17 Sep 05	116.2	1880	2140	470	750	54.4	03	(50)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 148.380, Code 3; Floy Tag: Pink 5052; PIT Tag: 7F7B0C6856

This individual was originally captured and tagged (PIT and yellow Floy #85) by RL&L in the Sinkut River area (Km 116.2) on 8 September 1996. When recaptured in Stuart Lake on 28 September 2002, the Floy tag was missing; a new Floy tag (red #2004) and a radio transmitter (frequency 148.380, code 3) were applied at this time. This fish was next caught in the Sinkut River area (Km 115.0) on 18 September 2005; the second Floy tag was missing but the PIT tag and radio transmitter were present. However, the radio transmitter had migrated forward into the fish so the tag was removed and then re-implanted into the fish. Extra sutures were added at the location of the old wound. A new Floy tag also was applied. This fish has been classed as a pre-vitellogenic female at each capture event (Table 3.20).

Table 3.20 Recapture information for white sturgeon (Pit #7F7B0C6856).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	8 Sep 96	116.2	1685	1925	470	630	35.5	12	45
CSTC	28 Sep 02	Stuart Lake	1820	2105	490	795	43.4[4]	12	(51)
Golder 05	18 Sep 05	115.0	1870	2180	515	715	44.0	12	(54)

[1]RL&L = Fraser River Sturgeon database from MoE; CSTC = LTB CSTC sturgeon 1996-2004 database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.
[4]Weight in kg converted from calculated weight found in database (95.7) that may be a mistake or in wrong unit (lbs).

Frequency 149.700, Code 42; Floy Tag: Pink 5053; PIT Tag: 7F7D7A574F

This individual was originally captured and tagged (PIT, yellow Floy #58, and external radio transmitter: frequency 149.680 code 108) downstream of Nine Mile Creek (Km 179.6) on 15 June 1996. When recaptured in the Sinkut River area (Km 114.9) on 18 September 2005, both external tags were missing. A new radio transmitter and a new Floy tag were applied in 2005. On both occasions examined, this fish has been classed as an early reproductive male (Table 3.21).

Table 3.21 Recapture information for white sturgeon (Pit #7F7D7A574F).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	15 Jun 96	179.6	1865	2120	470	720	na	03	46
Golder 05	18 Sep 05	114.9	1915	2200	490	710	46.3	03	(55)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 148.400, Code 6; Floy Tag: Pink 5056; PIT Tag: 7F7B033622

This individual was originally captured and tagged (PIT, yellow Floy #86, and external radio transmitter: frequency 149.460 code 35) near Keillor's Pointe (Km 111.2) on 9 September 1996. When recaptured in the Sinkut River area (Km 116.2) on 19 September 2005, both external tags were missing. A new radio transmitter and a new Floy tag were applied in 2005.This fish was classed as a late vitellogenic female (with black eggs) in both 1996 and 2005 (Table 3.22). Based on the size of egg samples collected in 2005, this fish could potentially spawn in 2006.

Table 3.22 Recapture information for white sturgeon (Pit #7F7B033622).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	9 Sep 96	111.2	1980	2190	465	740	63.3	14	65
Golder 05	19 Sep 05	116.2	2180	2410	535	805	73.0	14	(74)

[1]RL&L = Fraser River Sturgeon database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

Frequency 149.700, Code 43; Floy Tag: Red 2008; PIT Tag: 7F7D782004

This individual was originally captured and tagged (PIT and yellow Floy #42) in the Sinkut River area (Km 116.9) on 18 September 1997. When recaptured in the Stuart River (Km 49.3) on 1 August 2004, the Floy tag was missing so a new tag (red #2008) was applied. When next recaptured in the Sinkut River area (Km 116.2) on 19 September 2005, both tags were present. A radio transmitter was applied in 2005. In 1997 and 2004, this fish was classed as a maturing male (Table 3.23). However, in 2005, this fish was identified as a pre-vitellogenic female and an egg sample was taken.

Table 3.23 Recapture information for white sturgeon (Pit #7F7D782004).

Source[1]	Date	Site (River Km)	Length (mm)				Weight (kg)	Sex[2]	Age[3]
			Fork	Total	Snout	Girth			
RL&L	18 Sep 97	116.9	1895	2180	500	730	54.5	02	58
CSTC	1 Aug 04	Stuart R. 49.3	2095	2400	550	800	62.9	02	65
Golder 05	19 Sep 05	116.2	2125	2425	555	760	58.5	12	(66)

[1]RL&L = Fraser River Sturgeon database from MoE; CSTC = LTB CSTC sturgeon 1996-2004 database from MoE; Golder 05 = present study.
[2]For a description of maturity codes, see Appendix A, Table A3.
[3]( ) Age was extrapolated from the first pectoral fin ray age reading found in the fish database.

3.2 Monitoring Tagged Sturgeon

In total, 27 white sturgeon were radio tagged in the Nechako River during the 2005 tagging program (Appendix D, Table D1). Two more white sturgeon were captured that were equipped with an active radio tag previously installed by CSTC. Each fish equipped with a radio tag in 2005 was surgically examined to determine its state of sexual maturity; 17 (63.0 %) were males, eight (29.6 %) were females, and two were unknown (6.4 %; one juvenile and one adult based on length). Of the 17 males, two were non-reproductive, two were maturing, five were early reproductive, and eight were late reproductive (expected to spawn in spring 2006). Of the eight females, one was non-reproductive, six were pre-vitellogenic, and one was a late vitellogenic female with black eggs (expected to spawn in spring 2006).

Since 2001, 61 white sturgeon have been equipped with radio tags, of which 46 are still considered active according their estimated operational life. However, four more radio tags are still occasionally picked up by the receiver: a shed tag from 1997 (149.480-53) and three tag codes that are unknown to the program (149.700-17 149.700-18, and 149.700-56). The 46 active tags are separated into eight frequencies, with a range of 1 to

25 codes per frequency (Table 3.24). Two are CART tags which switch between acoustic and radio modes of operation every five seconds. The study used two different code sets: Code set 1994 consisted of 44 active radio tags separated into seven frequencies while Code set 2000 consisted of two active radio tags with the same frequency (149.770) but different code numbers.

When the fish are concentrated in one location, the more powerful tags coded out noticeably more frequently than the weaker tags. For example, a weaker tag may code out twice within 34 minutes of tracking whereas a more powerful tag will code out 82 times. As a result, tracking these fish is becoming more difficult and time consuming. To provide adequate reception coverage in future surveys when tracking is done by plane or helicopter, either multiple receivers will be necessary or some frequencies may have to be omitted. When tracking by boat, either more time will be required to scan for all frequencies, (i.e., several passes on some segments of river) or multiple receivers may be required.

Table 3.24 Summary of radio tags considered active according to their estimated operational life estimates, at the time of the 2005-2006 tracking study.

Frequency	Codes of tags considered active	Fish likely to spawn in 2006
148.320	2, 3, 4, 5	
148.380	1, 2, 3, 4, 5	
148.400	6, 8, 9	6: female, sex code 14 in Sep 05; has black eggs; may spawn in spring 2006.
148.420	11, 12, 14, 15	
149.480	54	
147.700	14, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43	25, 29, 30, 32, 33, 34, 40, and 41: eight males, sex code 04 in Sep 05; may spawn in spring 2006.
149.770	18, 26	
149.800 CART tag	1, 3	
8 frequencies	**46 radio tags**	

Tracking of radio-tagged individuals was accomplished from boat and from shore. Tracking by boat was conducted in late October 2005 near the two known overwintering areas (Km 116.2, Km 116.6, Km 117.0, and between Km 125.25 and Km 124.75). Thirty-seven tagged white sturgeon were located: 25 were located at Km 116.2 and 12 between Km 124.5 and 125.0. A 1997 white sturgeon tag was also identified in the Km 117.0 area, but it is thought to be a shed tag (RL&L 2000b). Fourteen of the fish tagged in 2005 stayed in the area where they were captured, tagged, and released. However, nine newly tagged fish moved to the next upstream overwintering area, and three moved to the next downstream overwintering area. Only one fish (149.700-42; tagged on 18 September 2005) was not located during the October 2005 boat tracking activity (Appendix D, Table D2).

Shore-based tracking was conducted in mid March 2006 from access sites near the two known overwintering areas (Km 116.2 and Km 124.6). Thirty-five tagged white sturgeon were located: 27 were located at Km 116.2 and 8 were located at Km 124.6. A 1997 white sturgeon shed tag and three tag codes unknown to the project were also identified in the Km 116.2 area. Out of 27 newly tagged fish, 20 had remained in the area where they were recorded in October 2005 and three had moved downstream to the next overwintering area. Four fish (149.700-14, 35, 37, and 41) tagged in 2005 were not located during the March 2006 survey (Appendix D, Table D2).

One late vitellogenic female white sturgeon (148.400-6), radio tagged in September 2005 is a potential pre-spawner and may spawn in spring 2006. This fish remained in the same overwintering area between its capture and the March 2006 tracking survey. This female was previously monitored under radio tag 149.460-35 (RL&L 1998).

Eight male white sturgeon (149.700-25, 29, 30, 32, 33, 34, 40, and 41) radio tagged in September 2005 were in late reproductive stage of development (Code 04) and also are considered as likely to spawn in spring 2006. Four of these fish stayed in their released locations, two moved upstream to the next overwintering area, one moved downstream to the next overwintering area, and two initially moved upstream to the next overwintering area and then moved back to their released locations.

Two males in early reproductive stages (Code 03) were newly tagged in 2005. Previous movement information for these fish is already available: fish 149.700-42 was formerly monitored under radio tag 149.680-108 and fish 148.400-8 was previously monitored under radio tag 149.740-105 (RL&L 1998). Fish 149.700-42 was located at Km 114.9 when recaptured; this fish was located again on 14 March 2006 at Km 116.2. However, 148.400-8 remained at its released location.

Two females of pre-vitellogenic stages (Code 12) were recaptured in 2005, but already had a recent, active radio tag. Information from the 2001 – 2005 tracking database shows that both these fish moved considerably. Female 148.420-14, captured in Stuart Lake on 27 September 2004, was located near Nechako River Km 116.2 on 17 September and 25 October 2005. However, this fish was not located on 14 March 2006. Female 148.380-3 captured in Stuart Lake on 28 September 2002, was located for the first time in the Nechako River on 8 July 2004. Once in the Nechako River, this fish stayed at the Km 116 overwintering area from August 2004 to mid-April 2005. She then moved to the Km 125 overwintering area but by September 2005, had moved back to the Km 116 overwintering area where she remained.

A pre-vitellogenic female (Code 12; PIT tag 7F7D7D4F7C) was not radio tagged in 2005. This female was previously monitored under radio tag 149.560-111 and movement information indicated this fish did not move from the time she was released in September 1995 to December 1997 (RL&L 1998). This lack of movement suggested the fish may have shed the tag.

3.3 Habitat Characteristics of Major Overwintering Areas

During the 2005 program, depths at white sturgeon sample locations ranged from 1.5 to 8.3 m and visibility ranged from 2.5 to 4.1 m (Appendix E, Table E1). Areas where white sturgeon were typically captured exhibited depths that ranged from 1.7 to 7.9 m, while the visibility range remained the same.

More detailed descriptions of habitat conditions in areas used by Nechako River white sturgeon for overwintering are provided in RL&L (1997). From this report, two figures are of most interest, Figure 3.15 presenting habitat conditions in the Nechako River above Leduc Creek (Km 124.5 to 125.2) in fall 1996 and Figure 3.16 presenting habitat conditions in the Nechako River below Chilco Creek (Km 116.0 to 116.5), also in fall 1996. These two overwintering areas were examined in October 2005 to collect data on micro-habitat conditions, including substrate, velocity, and bathymetric transects (Appendix E, Tables E2 and E3).

In the Chilco Creek / Sinkut River overwintering area (Km 116.2), fine and coarse sand as well as gravel was encountered in the major pool (Km 116.2) and slightly upstream (Km 116.25); fine sand was present slightly downstream (Km 116.0). Water velocities, taken from 1.5 m below the water surface, were 0.51 m/s upstream and downstream of the major pool and 0.10 m/s in the major pool. Seven bathymetric profiles were generated for this area: an e-line (longitudinal transect conducted along the river thalweg) which had a maximum depth recorded of 4.9 m and six cross-section profiles separated from a

"zigzag" line between both banks with a maximum depth of 6.8 m (Appendix E, Figures E1 and E2).

In the overwintering area downstream of Vanderhoof (Km 124.7), the stream bottom upstream and downstream of the main pool was too compact to obtain substrate samples. Hard clay and sand were present in the middle of the large pool (Km 124.7). Water velocities were 0.56 m/s upstream of the major pool (Km 125.0), 0.35 m/s in the pool, and 0.56 m/s downstream of the major pool (Km 124.6). Ten bathymetric profiles were generated for this area: an e-line, which had a maximum recorded depth of 7.7 m and nine cross-section profiles separated from a "zigzag" line between both banks with a maximum depth of 8.1 m (Appendix E, Figures E3 and E4).

4.0 CLOSURE

This report was prepared by Golder Associates Ltd. for the British Columbia Ministry of Environment in Prince George. The material in it reflects Golder's best judgement in light of information available to it at the time of preparation. Any use which a third party makes of this report or any reliance on or decisions to be made based on it, are the responsibility of such third party. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decision made or action base on this report.

We trust the above meets your requirements. Should you have any questions or require additional details, please contact the undersigned.

GOLDER ASSOCIATES LTD.

Report prepared by:

Francine Audy, B.Sc., BIT
Fisheries Biologist

Report reviewed by:

Larry Hildebrand, B.Sc., R.P.Bio
Associates and Senior Fisheries Scientist

Scott McKenzie, M.Sc., P.Biol.
Associates and Senior Fisheries Scientist

FA/LH/SM

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APPENDIX A

DESCRIPTION OF MATURITY STATE CLASSIFICATIONS

AND

OTHER FIELD FORMS

WHITE STURGEON DATA FORM - Set line

Project No.:_____

PHYSICAL DATA: Page ___ of ___ Sample ___ of ___

River: _____ Station _____ River Km _____ UTM: _____E_____N Set Type (circle) Index Synoptic

Personnel: _____ Channel Location: _____ Site Description: _____ Weather: _____

SET: ____/_____/____ @ _____ h Water Temp: _____ C Visibility: _____m Depth: Min _____; Max _____

PULL: ____/_____/____ @ _____ h Water Temp: _____ C Visibility: _____m Total Effort _____h

Gear Type: _____ No. Hooks Set (Lost): Size 12 = _____ (____), Size 14 = _____ (____), Size 16 = _____ (____), Baitless # _____

Bait Type: _____ No. Hooks Fouled: _____ Sampling Efficiency (1-4): _____

BIOLOGICAL DATA

NO.	RECAP	DEPTH (m)	HK SIZE	SEX MAT. CODE	LENGTH (cm)			GIRTH (cm)	WEIGHT (kg)	OTC (cc)	TAGS @ CAPT	TAGS @ REL	MARK @ CAPT	MARK @ REL	DNA	TAG NUMBERS							
					Fork	Total	Porb/ Poperc									Dart or Floy		PIT		Radio			
																C.	No.	S.	No.	T.	Freq.	Ch.	Cd.
1											- -	-											
1																							
2											- -	-		-									
2																							
3											- -	-		-									
3																							
4											- -	-		-									
4																							
5											- -	-		-									
5																							
6											- -	-		-									
6																							
7											- -	-		-									
7																							
8											- -	-		-									
8																							

Comments: _____

_____

_____

_____

_____

Station	Depth (m)	Velocities (m/s)					Substrate
		Bottom	0.2	0.6	0.8	Surface	
Nearshore							
Mid							
Offshore							

MAP: (Show shore configuration, flow patterns, set location, velocity, locations of measurements, substrate type(s), bank habitat, etc.)

_____

INCIDENTAL SP:

SPECIES	LENGTH	WEIGHT	SEX	TAG	CAP CODE	AGE STRUCTURE	FATE	HOOK SIZE	COMMENTS

FRASER RIVER - WHITE STURGEON ANGLING DATA FORM

PHYSICAL DATA:

Page ___ of ___
Sample ___ of ___

River: _____ Station _____ River Km _____ Channel Location: _____ UTM _____E_____N

Personnel: _____ Site Description: _____ Weather: _____

Date: _____/_____/_____ Water Temp: _____^{o}C Visibility: _____m Depth: _____m Boat or Shore _____

Rod #1	**Rod #2**	**Rod #3**	**Rod #4**	**Rod #5**	**Rod #6**
Start: _____	Start: _____	Start: _____	Start: _____	Start: _____	Start: _____
End: _____	End: _____	End: _____	End: _____	End: _____	End: _____
Effort: _____	Effort: _____	Effort: _____	Effort: _____	Effort: _____	Effort: _____
Hook Size _____	Hook Size _____	Hook Size _____	Hook Size _____	Hook Size _____	Hook Size _____
Bait _____	Bait _____	Bait _____	Bait _____	Bait _____	Bait _____
Baitless _____	Baitless _____	Baitless _____	Baitless _____	Baitless _____	Baitless _____
Fouled _____	Fouled _____	Fouled _____	Fouled _____	Fouled _____	Fouled _____
Lost _____	Lost _____	Lost _____	Lost _____	Lost _____	Lost _____

* If lost, indicate if snagged (S) or due to fish (F).

BIOLOGICAL DATA

NO.	DEPTH (m)	HOOK SIZE	SEX MAT CODE	LENGTH (cm)			GIRTH (cm)	WEIGHT (lb)	DNA	FISH DISP	TAGS @ CAPT	TAGS @ REL	MARK @ CAPT	MARK @ REL	TAG NUMBERS			
				Fork	Total	Porb/ Poperc									Dart		PIT	Radio
															C.	No.		
1										-	- -	-		-				
1																		
2										-	- -	-		-				
2																		
3										-	- -	-		-				
3																		
4										-	- -	-		-				
4																		
5										-	- -	-		-				
5																		
6										-	- -	-		-				
6																		
7										-	- -	-		-				
7																		
8										-	- -	-		-				
8																		

Comments:

_____

_____

_____

_____

_____

_____

MAP: (Show shore configuration, flow patterns, set location, velocity, and location of measurements etc.)

_____

INCIDENTAL SP:

SPECIES	LENGTH	WEIGHT	SEX	TAG	CAP CODE	AGE STRUCTURE	FATE	HOOK SIZE

FISH #	DEPTH (m)	VELOCITY (cm/s)	SUBSTRATE	COMMENTS

Table A3 Descriptive summary of sexual maturity codes for white sturgeon sampled in the Nechako River, 2005

Code	Sex	Development State Description[1]
98	Unknown	Gonad undifferentiated or not visible; juvenile based on size.
97	Unknown	Gonad not visible; adult based on size.
01	Male	Non-reproductive, testes appear as thin strips with no pigmentation.
11	Female	Non-reproductive; ovaries small, folded with no visible oocytes; tissue color white to yellowish.
02	Male	Maturing; small testes; some folding may be apparent; translucent, smoky pigmentation.
12	Female	Pre-vitellogenic, moderate size ovary with small eggs present (0.2 to 0.5 mm diameter); may have "salt and pepper" appearance.
03	Male	Early reproductive; large testes, folds beginning to form lobes; some pigmentation still present. Testes more white than cream coloured.
13	Female	Early vitellogenic; large ovary varying in color from white to yellowish-cream to light grey; eggs 0.6 to 2.1 mm in diameter.
04	Male	Late reproductive; testes large, often filling posterior of body cavity; white with little or no pigmentation.
14	Female	Late vitellogenic; ovaries large with pigmented oocytes still attached to ovarian tissue; eggs 2.2 to 2.9 mm in diameter; sometimes with salt and pepper appearance.
05	Male	Ripe; milt flowing; large white lobular testes; no pigmentation.
15	Female	Ripe; eggs fully pigmented and easily detached from ovarian tissue; eggs 3.0 to 3.4 mm in diameter.
06	Male	Spent; testes pinkish-white, flaccid, and strongly lobed.
16	Female	Spent; ovaries are flaccid with some residual fully developed eggs.
17	Female	Pre-vitellogenic with attritic oocytes; small eggs (< 0.5 mm diameter) present; dark pigmented tissue present that may be reabsorbed eggs.
10	Male	General unknown maturity.
20	Female	General unknown maturity.

[1]Description of maturity state classifications adapted from Conte et al. (1988).

APPENDIX B

CAPTURE DATA

Table B1 Summary of catch and catch rate (CPUE = no. fish caught/100 hook-hours) for white sturgeon captured by set line in the Nechako River, 12 to 19 September 2005.

Station (km)	Set Date	Set Time	Pull Date	Pull Time	Duration (h)	No. Hooks	Hook Hours	Catch	CPUE
SSL111.2R	9/17/05	15:57	9/18/05	16:55	25.0	8	199.7	0	0.0
SSL111.2R	9/18/05	17:05	9/19/05	10:42	17.6	8	140.9	0	0.0
SSL114.9R	9/15/05	16:30	9/16/05	15:28	23.0	8	183.7	1	0.5
SSL114.9R	9/16/05	16:20	9/17/05	15:20	23.0	8	184.0	0	0.0
SSL114.9R	9/17/05	15:28	9/18/05	15:45	24.3	8	194.3	2	1.0
SSL114.9R	9/18/05	16:45	9/19/05	11:00	18.3	8	146.0	0	0.0
SSL115.0R	9/15/05	16:25	9/16/05	15:19	22.9	8	183.2	0	0.0
SSL115.0R	9/16/05	15:26	9/17/05	15:10	23.7	8	189.9	0	0.0
SSL115.0R	9/17/05	15:16	9/18/05	14:20	23.1	8	184.5	1	0.5
SSL115.0R	9/18/05	15:39	9/19/05	11:06	19.5	8	155.6	0	0.0
SSL115.1R	9/15/05	16:17	9/16/05	14:22	22.1	8	176.7	1	0.6
SSL115.1R	9/16/05	15:16	9/17/05	14:33	23.3	8	186.3	1	0.5
SSL115.1R	9/17/05	15:05	9/18/05	14:05	23.0	8	184.0	0	0.0
SSL115.1R	9/18/05	14:13	9/19/05	11:15	21.0	8	168.3	0	0.0
SSL115.3R	9/16/05	16:33	9/17/05	13:39	21.1	8	168.8	2	1.2
SSL115.3R	9/17/05	14:25	9/18/05	13:20	22.9	8	183.3	1	0.5
SSL115.3R	9/18/05	14:00	9/19/05	11:23	21.4	8	171.1	1	0.6
SSL116.2L	9/14/05	17:45	9/15/05	13:20	19.6	8	156.7	4	2.6
SSL116.2L	9/15/05	16:04	9/16/05	12:50	20.8	8	166.1	2	1.2
SSL116.2L	9/16/05	14:18	9/17/05	12:17	22.0	8	175.9	1	0.6
SSL116.2L	9/17/05	13:08	9/18/05	12:03	22.9	8	183.3	1	0.5
SSL116.2L	9/18/05	13:11	9/19/05	11:53	22.7	8	181.6	2	1.1
SSL116.8L	9/14/05	17:36	9/15/05	12:00	18.4	8	147.2	1	0.7
SSL116.8L	9/15/05	13:06	9/15/05	16:38	3.5	8	28.3	1	3.5
SSL116.8L	9/15/05	17:31	9/16/05	11:11	17.7	8	141.3	3	2.1
SSL116.8L	9/16/05	12:47	9/17/05	10:56	22.2	8	177.2	2	1.1
SSL116.8L	9/17/05	12:09	9/18/05	10:51	22.7	8	181.6	1	0.6
SSL116.8L	9/18/05	11:56	9/19/05	13:21	25.4	8	203.3	0	0.0
SSL117.3L	9/14/05	17:25	9/15/05	11:46	18.3	8	146.8	0	0.0
SSL117.3L	9/15/05	11:55	9/16/05	9:47	21.9	8	174.9	2	1.1
SSL117.3L	9/16/05	11:07	9/17/05	10:39	23.5	8	188.3	0	0.0
SSL117.3L	9/17/05	10:46	9/18/05	9:59	23.2	8	185.7	1	0.5
SSL117.3L	9/18/05	10:44	9/19/05	13:33	26.8	8	214.5	1	0.5
SSL124.7R	9/13/05	14:41	9/14/05	14:09	23.5	8	187.7	1	0.5
SSL124.7R	9/14/05	15:11	9/15/05	10:11	19.0	8	152.0	1	0.7
SSL124.7R	9/15/05	11:28	9/16/05	9:23	21.9	8	175.3	0	0.0
SSL125.0L	9/13/05	12:12	9/13/05	16:06	3.9	30	117.0	0	0.0
SSL125.0L	9/13/05	16:30	9/14/05	10:47	18.3	30	548.5	2	0.4
SSL125.0L	9/14/05	14:02	9/15/05	9:43	19.7	30	590.5	0	0.0
SSL125.3L	9/13/05	11:48	9/13/05	16:35	4.8	8	38.3	0	0.0
SSL125.3L	9/13/05	16:41	9/14/05	10:21	17.7	8	141.3	0	0.0
SSL125.3L	9/14/05	10:30	9/15/05	9:15	22.7	8	182.0	0	0.0
SSL126.3R	9/13/05	11:33	9/14/05	10:03	22.5	8	180.0	0	0.0
SSL126.5L	9/13/05	11:20	9/14/05	9:49	22.5	8	179.9	0	0.0
SSL129.3L	9/13/05	10:38	9/14/05	9:30	22.9	8	182.9	0	0.0
SSL129.4L	9/12/05	18:51	9/13/05	10:15	15.4	8	123.2	0	0.0
SSL129.4L	9/13/05	10:26	9/14/05	9:12	22.8	8	182.1	0	0.0
SSL129.6L	9/12/05	18:41	9/13/05	10:00	15.3	8	122.5	0	0.0
SSL132.0R	9/12/05	18:27	9/13/05	9:47	15.3	8	122.7	0	0.0
SSL132.3R	9/12/05	18:17	9/13/05	9:39	15.4	8	122.9	0	0.0
Total							**9002.0**	**36**	**0.4**

Table B2 Summary of catch and catch rate (CPUE = no. fish caught/hook-hour) for white sturgeon captured by angling in the Nechako River, 13 to 19 September 2005.

Station (km)	Set		Pull		Duration (h)	No. Hooks	Hook Hours	Catch	CPUE
	Date	Time	Date	Time					
AB116.2M	9/19/05	14:26	9/19/05	14:44	0.3	1	0.3	1	3.3
AB116.2M	9/19/05	14:29	9/19/05	14:44	0.2	1	0.2	0	0.0
AB116.2M	9/19/05	14:35	9/19/05	14:44	0.1	1	0.1	0	0.0
AB117.0M	9/16/05	16:47	9/16/05	17:54	1.1	1	1.1	0	0.0
AB117.0M	9/16/05	16:54	9/16/05	17:54	1.0	1	1.0	0	0.0
AB117.0M	9/16/05	16:54	9/16/05	17:54	1.0	1	1.0	0	0.0
AB124.6M	9/17/05	16:30	9/17/05	16:45	0.2	1	0.2	0	0.0
AB124.6M	9/17/05	16:37	9/17/05	16:45	0.1	1	0.1	0	0.0
AB124.6M	9/17/05	16:38	9/17/05	16:45	0.1	1	0.1	1	8.6
AB124.7L	9/13/05	14:45	9/13/05	15:50	1.1	1	1.1	0	0.0
AB124.7L	9/13/05	14:50	9/13/05	15:50	1.0	1	1.0	0	0.0
AB124.7L	9/13/05	15:10	9/13/05	15:50	0.7	1	0.7	0	0.0
AB124.7R	9/13/05	12:30	9/13/05	14:27	1.9	1	1.9	0	0.0
AB124.7R	9/13/05	12:42	9/13/05	14:27	1.7	1	1.7	0	0.0
AB124.7R	9/13/05	12:48	9/13/05	14:27	1.6	1	1.6	0	0.0
Total							**12.4**	**2**	**0.2**

APPENDIX C

LIFE HISTORY DATA

Table C1 Capture and life history information for white sturgeon captured in the Nechako River, 2005

Ref. No.	Fork Length (mm)	Total Length (mm)	Weight (kg)	Snout Length (mm)	Girth (mm)	Sex[1]	Age (yrs)	Age Method[2]	Capture Method[3]	UTM Coordinates			Floy Tag		Pit Tag No.	Bio-sample Code[5]	Capture Date	Site (Km)	Capture Code[6]	Radio Tag			Photos	Comments
										Grid Zone	Easting	Northing	Color[4]	No.						Frequency	Channel	Code		
12.1	1015	1165	5.9	260	360	01	na	FR	SL	10U	439625	5984761	P	5028	45291D1875	1	14-Sep-05	124.7	0	149.700	22	21	162-168	Old wound on dorsal fin; sharp scutes.
14.1	1380	1590	22.9	355	520	97	na	FR	SL	10U	439872	5985102	P	5027	45250B6145	1	14-Sep-05	125.0	0	149.700	22	22	154-161	
14.2	860	1000	3.6	240	310	01	14	13 in 2004	SL	10U	439872	5985102	P	5026	424D3B7366	0	14-Sep-05	125.0	2	149.700	22	20	144-153	CSTC 23Sep04 @ 115.9 sex98 age13; Young fish; sharp scutes; cervical scar present.
18.1	1135	1300	9.5	300	415	02	na	FR	SL	10U	439625	5984761	P	5029	45250C6F52	1	15-Sep-05	124.7	0	149.700	22	24	176-182	Sharp scutes, no damage and no tear on fins.
20.1	1720	2000	35.8	465	670	12	53	43 in 1995 FR	SL	10U	446061	5982565	P	5030	7F7B0C4E1D	0	15-Sep-05	116.8	2	149.700	22	23	183-195	RLL 15Sep95 @ 124.5 sex03 age43; RLL 4Sep98 @ 116.2 sex20; Golder 4Oct01 @ 116.2 sex97
21.1	1540	1785	27.2	395	600	04	39	29 in 1995 FR	SL	10U	445635	5982223	P	5033	7F7B0B200A	0	15-Sep-05	116.2	2	149.700	22	25	196-197, 220-226	RLL 16Sep95 @ 116.2, sex02, age29; D3 scute torn.
21.2	1605	1830	30.4	415	635	11	na	na	SL	10U	445635	5982223	P	5032	4139136C2A	1	15-Sep-05	116.2	2	149.700	22	26	198, 212-219	Golder 28Sep01 @ 125.2, sex97
21.3	1745	1970	34.0	475	635	03	na	FR	SL	10U	445635	5982223	P	5031	45271E655C	1	15-Sep-05	116.2	0	149.700	22	27	199-200, 202-211	2.5 cm tear on right pelvic fin, 3.8 cm tear on lower caudal, both pectoral fins are deformed (rounded).
21.4	1980	2260	53.5	500	735	12	na	FR	SL	10U	445635	5982223	P	5034	4529141153	1	15-Sep-05	116.2	0	149.700	22	28	201, 227-236	Scars on back. D4, D6, & D7 scutes were damaged by set line and removed.
22.1	1830	2070	50.8	465	745	04	na	FR	SL	10U	446061	5982565	P	5035	452938611B	1	15-Sep-05	116.8	0	149.700	22	29	237-241	Fish looks healthy. Deformed upper lobe of caudal fin. Crevasse behind the operculum. Protusion at pectoral/girth location.
24.1	1635	1835	34.0	415	655	04	na	na	SL	10U	446037	5982942	Y	1335	4124714367	0	16-Sep-05	117.3	2	149.700	22	30	242-245	Golder 30Sep01 @ 115.1, sex97; Old floy tag left on fish. DNA mark visible.
24.2	1575	1765	26.8	415	595	12	na	FR	SL	10U	446037	5982942	P	5036	4528356F58	1	16-Sep-05	117.3	0	149.700	22	31	246-248	D3 scute ripped out and D4 half missing.
25.1	1850	2105	44.9	475	695	04	48	41 in 1998	SL	10U	445635	5982223	P	5038	7F7B033461	0	16-Sep-05	116.2	2	149.700	22	34	273-280	RLL 19Jun98 @ 96.4, sex03, age41; Golder 20Sep01 @ 111.2, sex03
25.2	1420	1600	20.9	365	540	12	na	FR	SL	10U	445635	5982223	P	5039	45296A4B00	1	16-Sep-05	116.2	0	149.700	22	35	281-282	Tip of caudal fin missing. Faulty pit tag located on right side of head.
26.1	990	1150	6.8	245	375	02	na	FR	SL	10U	444642	5982440	P	5040	452A06052F	1	16-Sep-05	115.1	0	149.700	22	36	283-288	Sharp scutes.
28.1	na	na	na	na	na	na	na	na	SL	10U	446037	5982942					15-Sep-05	117.3						Fish escaped - life history data not obtained
28.2	1670	1870	34.5	450	645	12	na	FR	SL	10U	444506	5982164	P	5041	4528347F32	1	16-Sep-05	114.9	0	149.700	22	37	None	D3 & D7 scutes with a slight tear, D5 scute half off, D8 scute half missing.
29.1	1615	1825	29.0	395	585	04	44	36 in 1997	SL	10U	446061	5982565	Y	1321	7F7B0C6725	0	16-Sep-05	116.8	2	149.700	22	32	251-257	RLL 17Sep97 @ 124.7, sex02, age36; RLL 1Sep98 @ 116.2, sex02; Golder 25Sep01 @ 125.2, sex97; DNA mark and surgery scar visible.
29.2	880	1025	4.1	230	300	98	12	8 in 2001	SL	10U	446061	5982565	G	46	424F201F7F	0	16-Sep-05	116.8	2	149.700	22	14	258-265	CSTC 29Aug01 @ 808.4 Fraser River, sex98, age8; DNA mark visible, surgery scar not visible. Floy tag with no ID.
29.3	1815	2080	46.3	475	715	04	45	37 in 1997 FR	SL	10U	446061	5982565	P	5037	7F7D7C115E	0	16-Sep-05	116.8	2	149.700	22	33	266-272	RLL 18Sep97 @ 116.2, sex97, age37; D7 scute missing. Surgical scar not visible.
31.1	1650	1860	34.9	450	655	03	46	39 in 1998	SL	10U	446061	5982565	P	5042	7F7B0C4C09	0	17-Sep-05	116.8	2				1	RLL 7Sep98 @ 124.7, sex03, age39; RLL 9Sep99 @ 125.0, sex98; Golder 1Oct01 @ 116.2, sex03; 10.2 cm tear on right pectoral fin, 6.4 cm tear on mid portion of caudal fin. 2 surgery scars visible. Sharp scutes. No radio tag applied.
31.2	1635	1890	27.7	420	585	03	na	FR	SL	10U	446061	5982565	P	5043	4528732143	1	17-Sep-05	116.8	0	149.700	22	38	2-4	D3 scute torn and removed.
32.1	1880	2140	54.4	470	750	03	50	40 in 1995 FR	SL	10U	445635	5982223	P	5044	7F7B04052A	0	17-Sep-05	116.2	2	149.700	22	39	5-9	RLL 16Sep95 @ 115.2, sex03, age40; Fins in good shape. D5 scute missing. Light surgery scar visible.

Note: na = data not available.

[1]For a description of maturity codes, see Appendix A, Table A3.

[2]FR = section of pectoral fin ray.

[3]SL = set line; AB = angling with bait.

[4]G = green, P = Pink; R = red; Y = yellow

[5]0 = no sample; 1 = tissue sampled from distal end of pectoral fin; 2 = blood sample; 3 = tissue and blood sample.

[6]0 = original capture; 2 = recapture.

Table C1 Continued.

Ref. No.	Fork Length (mm)	Total Length (mm)	Weight (kg)	Snout Length (mm)	Girth (mm)	Sex[1]	Age (yrs)	Age Method[2]	Capture Method[3]	UTM Coordinates			Floy Tag		Pit Tag No.	Bio-sample Code[5]	Capture Date	Site (Km)	Capture Code[6]	Radio Tag			Photos	Comments
										Grid Zone	Easting	Northing	Color[4]	No.						Frequency	Channel	Code		
33.1	1765	2025	44.5	465	715	97	na	na	SL	10U	444642	5982440	R	2076	5028040133	0	17-Sep-05	115.1	2	148.420	51	14	15-20	CSTC 27Sep04 @ Stuart Lake, sex12, RT 148.420 CH51 CD14; Recapture with no previous information available at time of capture. Fish released, no surgery conducted, no tag replaced. Left pectoral fin missing and well healed. No tissue between nostril (2) on right side. One split barbel on right.
36.1	1530	1720	24.9	400	575	97	na	FR	SL	10U	444835	5982545	P	5046	4525006927	1	17-Sep-05	115.3	0				11-14	3.8 cm tear on dorsal fin, 2 x 2.5 cm tear on anal fin. D5-D9 scutes damaged and gone due to setline. Good hook damage at mouth. Line of abrasion near gill.
36.2	1630	1825	28.1	390	600	12	na	na	SL	10U	444835	5982545	P	5045	4124684A2D	0	17-Sep-05	115.3	2				10	Golder 21Sep01 @ 116.2, sex97; Red mark on caudal fin due to setline. Scutes not damaged. 3.8 cm tear on upper portion of caudal fin. Pit tag located in head.
38.1	1815	2090	42.2	465	680	12	50	40 in 1995	SL	10U	446037	5982942	Y	31	7F7D7D4F7C	0	18-Sep-05	117.3	2				36-43	RLL 19Sep95 @ 116.2, sex12, age40, RT149.560 CH13 CD111; Dart tag present. Radio tag missing but no visible marks on scutes. Surgery scar visible.
39.1	1795	2035	47.6	440	715	04	na	FR	SL	10U	446061	5982565	P	5048	4528394A39	1	18-Sep-05	116.8	0	149.700	22	41	44-50	D2 and L14 scutes missing and 1 ventral scute cracked.
40.1	1930	2155	57.2	520	790	97	na	FR	SL	10U	445635	5982223	P	5049	4523051833	1	18-Sep-05	116.2	0				52-55	2 x 6.4 cm tear in lower lobe of caudal fin. Cut fishing line located at anus (see photo).
41.1	970	1140	5.9	245	355	98	na	FR	SL	10U	444835	5982545	P	5050	4529443547	1	18-Sep-05	115.3	0				56-61	Sharp scutes. 2.5 cm tear on lower caudal fin.
43.1	1870	2180	44.0	515	715	12	54	45 in 1996	SL	10U	444502	5982263	P	5052	7F7B0C6856	0	18-Sep-05	115.0	2	148.380	60	3	62-73	RLL 8Sep96 @ 116.2, age 45, sex 12; CSTC 28Sep02 @ Stuart Lake, sex 12, RT148.380 CH60 CD3. Radio tag antenna appears to have torn the old surgery scar. RT has migrated forward (see photo). Reason for new surgery: RT may be old and lack of previous data at time of capture. Removed RT. Added 2 sutures on old surgery scar. Discussed RT life expectancy with Cory Williamson (RT from 2002, tag life 5 to 7 years). Inserted RT back into fish.
44.1	1915	2200	46.3	490	710	03	55	46 in 1996	SL	10U	444506	5982164	P	5053	7F7D7A574F	0	18-Sep-05	114.9	2	149.700	22	42	81-87	RLL 15Jun96 @ 179.6, sex03, age46, RT149.680 CH19 CD108; D4 scute torn but not removed, D8 scute torn & damaged and loose chuck removed. Previous external RT & surgical scars visible. Healed scar on left pectoral fin. 2 tears on caudal fin.
44.2	740	830	2.7	195	270	98	na	FR	SL	10U	444506	5982164	P	5051	45285F5E40	1	18-Sep-05	114.9	0				74-80	Nice healthy young fish.
46c.1	1480	1690	24.5	385	580	04	39	29 in 1995	AB	10U	439707	5984819	P	5047	7F7D775A36	0	17-Sep-05	124.6	2	149.700	22	40	21-35	RLL 10Jun95 @ 93.1, sex98, age29; RLL 22Jun98 @ 115.2, sex02; Surgical scar visible. Sharp scutes. Crinkled lower lobe of caudal fin.
47.1	1165	1335	9.4	285	395	97	na	FR	SL	10U	446037	5982942	P	5055	4527666B79	1	19-Sep-05	117.3	0				101-108	Razor sharp scutes.
49.1	1860	2090	46.7	490	750	03	54	45 in 1996	SL	10U	445635	5982223	Y	Dart 093	7F7B0C6864	0	19-Sep-05	116.2	2	148.400	0	8	96-100	RLL 16Sep96 @ 72.6, sex02, age45, RT149.740 CH22 CD105; Dart tag. Right L18 scute torn and removed, D4 scute missing. Surgical scar visible.
49.2	2125	2425	58.5	555	760	12	66	58 in 1997	SL	10U	445635	5982223	R	2008	7F7D782004	0	19-Sep-05	116.2	2	149.700	22	43	90-95	RLL 18Sep97 @ 116.9, sex02, age58; CSTC 1Aug04 @ 49.3 Stuart River, sex02, age65; Surgery scar visible. D4 scute missing.
50.1	1095	1275	8.4	280	400	97	na	FR	SL	10U	444835	5982545	P	5054	452761656E	1	19-Sep-05	115.3	0				88-89	Sharp scutes.
55a.1	2180	2410	73.0	535	805	14	74	65 in 1996	AB	10U	445635	5982223	P	5056	7F7B033622	0	19-Sep-05	116.2	2	148.400	0	6	109-136	RLL 9Sep96 @ 111.2, sex14, age65, RT149.460 CH8 CD35; D7 scute missing. Surgical scar visible. Right pectoral fin split. 2 tears on lower caudal fin. 1 tear on left pelvic fin. Possibly had a RT on scute.

Note: na = data not available.

[1]For a description of maturity codes, see Appendix A, Table A3.

[2]FR = section of pectoral fin ray.

[3]SL = set line; AB = angling with bait.

[4]G = green, P = Pink; R = red; Y = yellow

[5]0 = no sample; 1 = tissue sampled from distal end of pectoral fin; 2 = blood sample; 3 = tissue and blood sample.

[6]0 = original capture; 2 = recapture.

Table C2 Descriptive summary of sexual maturity of white sturgeon sampled in the Nechako River, 2005

Maturity Code[1]	Fork Length (mm)	Total Length (mm)	Snout Length (mm)	Girth (mm)	Weight (kg)	Age (yrs)	River km	Capture Date	Floy Tag		Pit Tag No.	Radio Tag			General Description
									Color[2]	No.		Frequency	Channel	Code	
01	1015	1165	260	360	5.9	na	124.7	14-Sep-05	P	5028	45291D1875	149.700	22	21	**Male:** Testes white with light speckling. Testes filling less than 1/4 of the ventral cavity, no lobes apparent. Flaccid belly. Fluid in cavity.
97	1380	1590	355	520	22.9	na	125.0	14-Sep-05	P	5027	45250B6145	149.700	22	22	**Adult:** Based on size; sex and maturity not determined due to otoscope malfunction. Flaccid belly.
01	860	1000	240	310	3.6	14	125.0	14-Sep-05	P	5026	424D3B7366	149.700	22	20	**Male:** Testes white in color and small, filling less than 1/4 of the ventral cavity.
02	1135	1300	300	415	9.5	na	124.7	15-Sep-05	P	5029	45250C6F52	149.700	22	24	**Male:** Testes cream coloured with some lobing and white speckling. Testes filling about 1/4 of the ventral cavity, more developed on left side. Slightly flaccid belly, some fluid in body cavity (hard to see ventral surface).
12	1720	2000	465	670	35.8	53	116.8	15-Sep-05	P	5030	7F7B0C4E1D	149.700	22	23	**Female:** Ovaries grey coloured with dark smokey pigmentation. Ovaries filling 1/3 of the ventral cavity. Eggs white, small in diameter, less than 1mm in diameter. Surgical scare visible on belly. Belly slightly flaccid. Fluid in cavity.
04	1540	1785	395	600	27.2	39	116.2	15-Sep-05	P	5033	7F7B0B200A	149.700	22	25	**Male:** Testes more white than yellow in color. Definite folds in anterior portion and some lobes in posterior portion of the ventral cavity. Testes filling 1/2 of the ventral cavity. Fat belly.
11	1605	1830	415	635	30.4	na	116.2	15-Sep-05	P	5032	4139136C2A	149.700	22	26	**Female:** Ovaries creamy yellow in color, filling less than 1/3 of the ventral cavity. Eggs small, clear/translucid, and less than 0.5mm in diameter.
03	1745	1970	475	635	34.0	na	116.2	15-Sep-05	P	5031	45271E655C	149.700	22	27	**Male:** Testes yellowish to cream coloured with light speckling. Some lobes visible. Testes filling 1/3 of the ventral cavity. Flaccid belly. **Early 03.**
12	1980	2260	500	735	53.5	na	116.2	15-Sep-05	P	5034	4529141153	149.700	22	28	**Female:** Ovaries cream to yellow coloured. Ovaries filling 1/2 of the ventral cavity. Eggs white, less than 0.5mm in diameter and varying in size.
04	1830	2070	465	745	50.8	na	116.8	15-Sep-05	P	5035	452938611B	149.700	22	29	**Male:** Testes white coloured. Folds forming lobes mainly in the anterior portion of the ventral cavity. Testes large, filling 1/2 of ventral cavity.
04	1635	1835	415	655	34.0	na	117.3	16-Sep-05	Y	1335	4124714367	149.700	22	30	**Male:** Testes cream coloured with light pigmentation. Folds forming lobes in anterior of the ventral cavity. Testes filling 1/2 of the ventral cavity. Firm belly. **Early 04**
12	1575	1765	415	595	26.8	na	117.3	16-Sep-05	P	5036	4528356F58	149.700	22	31	**Female:** Ovaries cream coloured with smoky pigmentation (salt and pepper). Ovaries filling 1/2 of the ventral cavity, left side more developed than right side. Eggs white, less than 0.5mm in diameter and varying in size.
04	1850	2105	475	695	44.9	48	116.2	16-Sep-05	P	5038	7F7B033461	149.700	22	34	**Male:** Testes cream to white coloured. Folds beginning to form lobes. Testes filling 1/2 of the ventral cavity. Flaccid belly, some fluid in body cavity. **Early 03.**
12	1420	1600	365	540	20.9	na	116.2	16-Sep-05	P	5039	45296A4B00	149.700	22	35	**Female:** Ovaries white with salt and pepper speckling. Some lobing in anterior portion of ventral cavity. Ovaries filling 1/2 of the ventral cavity. Eggs clear/translucent, less than 0.5mm in diameter. Firm belly. **Early 03**
02	990	1150	245	375	6.8	na	115.1	16-Sep-05	P	5040	452A06052F	149.700	22	36	**Male:** Testes cream coloured. Slight lobing in the ventral anterior portion of the testes. Testes filling less than 1/4 of the ventral cavity.
12	1670	1870	450	645	34.5	na	114.9	16-Sep-05	P	5041	4528347F32	149.700	22	37	**Female:** Ovaries white with light salt and pepper speckling. Eggs more apparent on left side of ventral cavity. Ovaries filling less than 1/3 of the ventral cavity. Eggs white, less than 0.5mm in diameter and varying in size.
04	1615	1825	395	585	29.0	44	116.8	16-Sep-05	Y	1321	7F7B0C6725	149.700	22	32	**Male:** Testes cream coloured with light speckling pigmentation. Folds beginning to form lobes. Testes filling 1/2 of the body cavity. Firm belly.
98	880	1025	230	300	4.1	12	116.8	16-Sep-05	G	46	424F201F7F	149.700	22	14	**Juvenile:** Based on size; sex and maturity not determined. Lots of fluid in belly. Gonads small, creamy yellow, filling less than 1/4 of cavity.
04	1815	2080	475	715	46.3	45	116.8	16-Sep-05	P	5037	7F7D7C115E	149.700	22	33	**Male:** Testes cream coloured with no pigmentation. Folds forming lobes in anterior portion and some lobing in posterior portion of the ventral cavity. Testes filling 1/2 of the ventral cavity. Flaccid belly.
03	1650	1860	450	655	34.9	46	116.8	17-Sep-05	P	5042	7F7B0C4C09				**Male:** Testes white coloured with smoky pigmentation. Some lobes apparent in the right ventral anterior portion of the testes. Testes filling 1/3 of cavity. Sexual determination based on pigmentation of gonads. Flaccid belly, lots of fluid in body cavity (difficult to see).
03	1635	1890	420	585	27.7	na	116.8	17-Sep-05	P	5043	4528732143	149.700	22	38	**Male:** Testes cream coloured with smoky pigmentation, more white apparent on ventral surface. Folds beginning to form lobes. Testes filling less than 1/2 of the ventral cavity. Flaccid belly. Fair amount of fluid in cavity. **Early to mid 03**
03	1880	2140	470	750	54.4	50	116.2	17-Sep-05	P	5044	7F7B04052A	149.700	22	39	**Male:** Testes cream coloured with smoky pigmentation. Folds beginning to form lobes. Testes filling 1/2 of the ventral cavity and appear larger on left side. **Late 03/Early 04**.
97	1765	2025	465	715	44.5	na	115.1	17-Sep-05	R	2076	5028040133	148.420		14	**Adult:** Based on size; sex and maturity not determined. Recapture with no previous information available at time of capture. No surgery conducted.
97	1530	1720	400	575	24.9	na	115.3	17-Sep-05	P	5046	4525006927				**Adult:** Based on size; sex and maturity not determined. No surgery due to stress on fish.
12	1630	1825	390	600	28.1	na	115.3	17-Sep-05	P	5045	4124684A2D				**Female:** Ovaries cream coloured with light salt and pepper pigmentation. Ovaries filling about 1/3 of the ventral cavity and more developed on the right side. Eggs clear, less than 0.5mm in diameter.
12	1815	2090	465	680	42.2	50	117.3	18-Sep-05	Y	31	7F7D7D4F7C				**Female:** Ovaries yellow coloured. Ovaries filling 1/2 of the ventral cavity. Ovaries appears larger on left side. Eggs white, less than 0.5mm in diameter and varying in size. Belly Slightly flaccid.
04	1795	2035	440	715	47.6	na	116.8	18-Sep-05	P	5048	4528394A39	149.700	22	41	**Male:** Testes more white than cream in color with light pigmentation/speckling. Folds forming lobes in anterior portion of the ventral cavity. Testes filling 2/3 to 1/4 of the ventral cavity. Fat belly.
97	1930	2155	520	790	57.2	na	116.2	18-Sep-05	P	5049	4523051833				**Adult:** Based on size; sex and maturity not determined. Firm belly. Abundant fluid in body cavity. Dark inside possibly due to recent meal (fish in stomach created an extended stomach and pushed gonads away from surgical opening). Can only see white tissue on the left side of the surgical opening. Gonads small and obscured by stomach and fluid.
98	970	1140	245	355	5.9	na	115.3	18-Sep-05	P	5050	4529443547				**Juvenile**: Based on size; sex and maturity not determined. No surgery due to size.
12	1870	2180	515	715	44.0	54	115.0	18-Sep-05	P	5052	7F7B0C6856	148.380	60	3	**Female:** Ovaries filling 1/2 of the ventral cavity. Eggs white, less than 0.5mm in diameter and varying in size. Eggs sample taken with Allison forceps. Lots of fluid in cavity.
03	1915	2200	490	710	46.3	55	114.9	18-Sep-05	P	5053	7F7D7A574F	149.700	22	42	**Male:** Testes white coloured on left side, more speckling visible on right side. Testes more developed on the left portion of the ventral cavity. Folds beginning to form lobes. Lobes observed in the posterior portion and some folds in middle portion of the ventral cavity. Testes filling 60% of the ventral cavity. **Late 03/Early 04**.

Note: na = data not available.

[1]For a description of maturity codes, see Appendix A, Table A3.

[2]G = green, P = Pink; R = red; Y = yellow

Table C2 Continued.

Maturity Code[1]	Fork Length (mm)	Total Length (mm)	Snout Length (mm)	Girth (mm)	Weight (kg)	Age (yrs)	River km	Capture Date	Floy Tag		Pit Tag No.	Radio Tag			General Description
									Color[2]	No.		Frequency	Channel	Code	
98	740	830	195	270	2.7	na	114.9	18-Sep-05	P	5051	45285F5E40				**Juvenile**: Based on size; sex and maturity not determined. No surgery due to size.
04	1480	1690	385	580	24.5	39	124.6	17-Sep-05	P	5047	7F7D775A36	149.700	22	40	**Male:** Testes white coloured with yellowish ventral surface and light smoky pigmentation. Folds forming lobes all the way through the ventral cavity. Left side of testes more developed than right side. Testes filling 1/2 of the ventral cavity. Flaccid belly. **Early 04**
97	1165	1335	285	395	9.4	na	117.3	19-Sep-05	P	5055	4527666B79				**Adult:** Based on size; sex and maturity not determined. No surgery due to size.
03	1860	2090	490	750	46.7	54	116.2	19-Sep-05	Y	Dart 093	7F7B0C6864	148.400	0	8	**Male:** Testes cream to white coloured with smoky pigmentation. Folds beginning to form lobes. Testes filling 1/2 of the ventral cavity. Fat belly, fluid in cavity.
12	2125	2425	555	760	58.5	66	116.2	19-Sep-05	R	2008	7F7D782004	149.700	22	43	**Female:** Ovaries white with light smoky pigmentation. Ovaries filling 1/3-1/2 of the ventral cavity. Ovaries more developed on the left side. Eggs white, less than 0.5mm in diameter and varying in size. Eggs sampled. Flaccid belly.
97	1095	1275	280	400	8.4	na	115.3	19-Sep-05	P	5054	452761656E				**Adult:** Based on size; sex and maturity not determined. No surgery due to small size.
14	2180	2410	535	805	73.0	74	116.2	19-Sep-05	P	5056	7F7B033622	148.400	0	6	**Female:** Ovaries of dark brown and cream color and filling ventral cavity. Eggs black, easily detached from ovarian tissues. Sampled 10 black eggs = 23 mm, egg diam. 2.3 mm. Very firm belly.

Note: na = data not available.

[1]For a description of maturity codes, see Appendix A, Table A3.

[2]G = green, P = Pink; R = red; Y = yellow

Table C3 Life history and tag information of white sturgeon from which DNA, age structures, and ovary samples were obtained, Nechako River, 2005.

Fork Length (cm)	Weight (kg)	Floy Tag[1]	PIT Tag	Capture Date	DNA Type[2]	Age Type[3]	Egg Sample[4]	Comments
138.0	22.9	P5027	45250B6145	14-Sep	1	L	N	
101.5	5.9	P5028	45291D1875	14-Sep	1	L	N	
113.5	9.5	P5029	45250C6F52	15-Sep	1	L	N	
172.0	35.8	P5030	7F7B0C4E1D	15-Sep	0	R	N	
174.5	34.0	P5031	45271E655C	15-Sep	1	L	N	
160.5	30.4	P5032	4139136C2A	15-Sep	1	N	N	
154.0	27.2	P5033	7F7B0B200A	15-Sep	0	R	N	
198.0	53.5	P5034	4529141153	15-Sep	1	L	N	
183.0	50.8	P5035	452938611B	15-Sep	1	L	N	
157.5	26.8	P5036	4528356F58	16-Sep	1	L	N	
142.0	20.9	P5039	45296A4B00	16-Sep	1	L	N	
99.0	6.8	P5040	452A06052F	16-Sep	1	L	N	
167.0	34.5	P5041	4528347F32	16-Sep	1	L	N	
181.5	46.3	P5037	7F7D7C115E	16-Sep	0	R	N	
153.0	24.9	P5046	4525006927	17-Sep	1	L	N	
188.0	54.4	P5044	7F7B04052A	17-Sep	0	R	N	
163.5	27.7	P5043	4528732143	17-Sep	1	L	N	
179.5	47.6	P5048	4528394A39	18-Sep	1	L	N	
193.0	57.2	P5049	4523051833	18-Sep	1	L	N	
97.0	5.9	P5050	4529443547	18-Sep	1	L	N	
187.0	44.0	P5052	7F7B0C6856	18-Sep	0	N	Y	biopsy sample taken
74.0	2.7	P5051	45285F5E40	18-Sep	1	L	N	
116.5	9.4	P5055	4527666B79	19-Sep	1	L	N	
212.5	58.5	R2008	7F7D782004	19-Sep	0	N	Y	biopsy sample taken
109.5	8.4	P5054	452761656E	19-Sep	1	L	N	
218.0	73.0	P5056	7F7B033622	19-Sep	0	N	Y	10 black eggs = 23 mm.

[1]Floy tag color P = Pink, R = Red.

[2]0 = No sample; 1 = Tissue sample from distal end of pectoral fin

[3]N = No sample; L = Section of the left pectoral fin ray; R = Section of the right pectoral fin ray.

[4]N = No sample taken; Y = Sample taken.

Table C4 Recapture information for white sturgeon in the Nechako River, 2005

Fork Length (mm)	Weight (kg)	Sex[1]	Age (yrs)	Age Method[2]	UTM Coordinates			Floy Tag		Pit Tag No.	Capture Date	Site (Km)	Radio Tag			Recapture Comments	Tag Comments
					Grid Zone	Easting	Northing	Color[3]	No.				Frequency	Channel	Code		
860	3.6	01	14	13 in 2004	10U	439872	5985102	P	5026	424D3B7366	14-Sep-05	125.0	149.700	22	20	CSTC 23Sep04 @ 115.9 sex98 age13	
1720	35.8	12	53	43 in 1995 FR	10U	446061	5982565	P	5030	7F7B0C4E1D	15-Sep-05	116.8	149.700	22	23	RLL 15Sep95 @ 124.5 sex03 age43; RLL 4Sep98 @ 116.2 sex20; Golder 4Oct01 @ 116.2 sex97	It is suspected that the male identification is a typo mistake in the database, since three years later RLL identified the fish as a Code 20, female of general unknown maturity, instead of as a Code 10, male of general unknown maturity.
1540	27.2	04	39	29 in 1995 FR	10U	445635	5982223	P	5033	7F7B0B200A	15-Sep-05	116.2	149.700	22	25	RLL 16Sep95 @ 116.2, sex02, age29	
1605	30.4	11	na	na	10U	445635	5982223	P	5032	4139136C2A	15-Sep-05	116.2	149.700	22	26	Golder 28Sep01 @ 125.2, sex97	
1635	34.0	04	na	na	10U	446037	5982942	Y	1335	4124714367	16-Sep-05	117.3	149.700	22	30	Golder 30Sep01 @ 115.1, sex97	Old floy tag left on fish.
1850	44.9	04	48	41 in 1998	10U	445635	5982223	P	5038	7F7B033461	16-Sep-05	116.2	149.700	22	34	RLL 19Jun98 @ 96.4, sex03, age41; Golder 20Sep01 @ 111.2, sex03	
1615	29.0	04	44	36 in 1997	10U	446061	5982565	Y	1321	7F7B0C6725	16-Sep-05	116.8	149.700	22	32	RLL 17Sep97 @ 124.7, sex02, age36; RLL 1Sep98 @ 116.2, sex02; Golder 25Sep01 @ 125.2, sex97	
880	4.1	98	12	8 in 2001	10U	446061	5982565	G	46	424F201F7F	16-Sep-05	116.8	149.700	22	14	CSTC 29Aug01 @ 808.4 Fraser River, sex98, age8	Floy tag with no ID, used BT radio tag.
1815	46.3	04	45	37 in 1997 FR	10U	446061	5982565	P	5037	7F7D7C115E	16-Sep-05	116.8	149.700	22	33	RLL 18Sep97 @ 116.2, sex97, age37	
1650	34.9	03	46	39 in 1998	10U	446061	5982565	P	5042	7F7B0C4C09	17-Sep-05	116.8				RLL 7Sep98 @ 124.7, sex03, age39; RLL 9Sep99 @ 125.0, sex98; Golder 1Oct01 @ 116.2, sex03	No radio tag applied.
1880	54.4	03	50	40 in 1995 FR	10U	445635	5982223	P	5044	7F7B04052A	17-Sep-05	116.2	149.700	22	39	RLL 16Sep95 @ 115.2, sex03, age40	
1765	44.5	97	na	na	10U	444642	5982440	R	2076	5028040133	17-Sep-05	115.1	148.420		14	CSTC 27Sep04 @ Stuart Lake, sex12, RT 148.420 CH51 CD14	Recapture with no previous information available at time of capture. Fish released, no surgery conducted, no tag replaced.
1630	28.1	12	na	na	10U	444835	5982545	P	5045	4124684A2D	17-Sep-05	115.3				Golder 21Sep01 @ 116.2, sex97	Pit tag located in head.
1815	42.2	12	50	40 in 1995	10U	446037	5982942	Y	31	7F7D7D4F7C	18-Sep-05	117.3				RLL 19Sep95 @ 116.2, sex12, age40, RT149.560 CH13 CD111	Dart tag present. Radio tag missing but no visible marks on scutes.
1870	44.0	12	54	45 in 1996	10U	444502	5982263	P	5052	7F7B0C6856	18-Sep-05	115.0	148.380	60	3	RLL 8Sep96 @ 116.2, age 45, sex 12; CSTC 28Sep02 @ Stuart Lake, sex 12, RT148.380 CH60 CD3	Radio tag antenna appears to have torn the old surgery scar. RT has migrated forward (see photo). Reason for new surgery: RT may be old and lack of previous data available at time of capture. Removed RT. Added 2 sutures on old surgery scar. Discussed RT life expectancy with Cory Williamson (RT from 2002, tag life 5 to 7 years). Inserted RT back into fish.
1915	46.3	03	55	46 in 1996	10U	444506	5982164	P	5053	7F7D7A574F	18-Sep-05	114.9	149.700	22	42	RLL 15Jun96 @ 179.6, sex03, age46, RT149.680 CH19 CD108	Previous external RT scars visible.
1480	24.5	04	39	29 in 1995	10U	439707	5984819	P	5047	7F7D775A36	17-Sep-05	124.6	149.700	22	40	RLL 10Jun95 @ 93.1, sex98, age29; RLL 22Jun98 @ 115.2, sex02	
1860	46.7	03	54	45 in 1996	10U	445635	5982223	Y	Dart 093	7F7B0C6864	19-Sep-05	116.2	148.400	0	8	RLL 16Sep96 @ 72.6, sex02, age45, RT149.740 CH22 CD105	Dart tag.
2125	58.5	12	66	58 in 1997	10U	445635	5982223	R	2008	7F7D782004	19-Sep-05	116.2	149.700	22	43	RLL 18Sep97 @ 116.9, sex02, age58; CSTC 1Aug04 @ 49.3 Stuart River, sex02, age65	Misidentification of sex occurs sometimes, but, mainly for fish in early stages. There is also the possibility that the earlier data (1997 and 2004) were entered into the database incorrectly.
2180	73.0	14	74	65 in 1996	10U	445635	5982223	P	5056	7F7B033622	19-Sep-05	116.2	148.400	0	6	RLL 9Sep96 @ 111.2, sex14, age65, RT149.460 CH8 CD35	Damage to scute; may have been previously equipped with an externally mounted radio tag.

Note: na = data not available.

[1]For a description of maturity codes, see Appendix A, Table A3.

[2]FR = section of pectoral fin ray.

[3]G = green, P = Pink; R = red; Y = yellow

APPENDIX D

MARK-RECAPTURE

AND

RADIO TELEMETRY DATA

Table D1 Life history and capture information for white sturgeon implanted with an internal radio transmitter, Nechako River, 2005.

Fork Length (mm)	Weight (kg)	Sex[1]	Radio Tag			Floy Tag		Pit Tag No.	Released Date	Site (Km)	UTM Coordinates			Comments
			Frequency	Channel	Code	Color[2]	No.				Grid Zone	Easting	Northing	
1015	5.9	01	149.700	22	21	P	5028	45291D1875	14-Sep-05	124.7	10U	439625	5984761	
1380	22.9	97	149.700	22	22	P	5027	45250B6145	14-Sep-05	125.0	10U	439872	5985102	
860	3.6	01	149.700	22	20	P	5026	424D3B7366	14-Sep-05	125.0	10U	439872	5985102	
1135	9.5	02	149.700	22	24	P	5029	45250C6F52	15-Sep-05	124.7	10U	439625	5984761	
1720	35.8	12	149.700	22	23	P	5030	7F7B0C4E1D	15-Sep-05	116.8	10U	446061	5982565	
1540	27.2	04	149.700	22	25	P	5033	7F7B0B200A	15-Sep-05	116.2	10U	445635	5982223	
1605	30.4	11	149.700	22	26	P	5032	4139136C2A	15-Sep-05	116.2	10U	445635	5982223	
1745	34.0	03	149.700	22	27	P	5031	45271E655C	15-Sep-05	116.2	10U	445635	5982223	
1980	53.5	12	149.700	22	28	P	5034	4529141153	15-Sep-05	116.2	10U	445635	5982223	
1830	50.8	04	149.700	22	29	P	5035	452938611B	15-Sep-05	116.8	10U	446061	5982565	
1635	34.0	04	149.700	22	30	Y	1335	4124714367	16-Sep-05	117.3	10U	446037	5982942	
1575	26.8	12	149.700	22	31	P	5036	4528356F58	16-Sep-05	117.3	10U	446037	5982942	
1850	44.9	04	149.700	22	34	P	5038	7F7B033461	16-Sep-05	116.2	10U	445635	5982223	
1420	20.9	12	149.700	22	35	P	5039	45296A4B00	16-Sep-05	116.2	10U	445635	5982223	
990	6.8	02	149.700	22	36	P	5040	452A06052F	16-Sep-05	115.1	10U	444642	5982440	
1670	34.5	12	149.700	22	37	P	5041	4528347F32	16-Sep-05	114.9	10U	444506	5982164	
1615	29.0	04	149.700	22	32	Y	1321	7F7B0C6725	16-Sep-05	116.8	10U	446061	5982565	
880	4.1	98	149.700	22	14	G	46	424F201F7F	16-Sep-05	116.8	10U	446061	5982565	
1815	46.3	04	149.700	22	33	P	5037	7F7D7C115E	16-Sep-05	116.8	10U	446061	5982565	
1635	27.7	03	149.700	22	38	P	5043	4528732143	17-Sep-05	116.8	10U	446061	5982565	
1880	54.4	03	149.700	22	39	P	5044	7F7B04052A	17-Sep-05	116.2	10U	445635	5982223	
1795	47.6	04	149.700	22	41	P	5048	4528394A39	18-Sep-05	116.8	10U	446061	5982565	
1915	46.3	03	149.700	22	42	P	5053	7F7D7A574F	18-Sep-05	114.9	10U	444506	5982164	Former RT: 149.680 CH19 CD108 (RLL 15Jun96)
1480	24.5	04	149.700	22	40	P	5047	7F7D775A36	17-Sep-05	124.6	10U	439707	5984819	
1860	46.7	03	148.400	0	8	Y	Dart 093	7F7B0C6864	19-Sep-05	116.2	10U	445635	5982223	Former RT: 149.740 CH22 CD105 (RLL 16Sep96)
2125	58.5	12	149.700	22	43	R	2008	7F7D782004	19-Sep-05	116.2	10U	445635	5982223	
2180	73.0	14	148.400	0	6	P	5056	7F7B033622	19-Sep-05	116.2	10U	445635	5982223	Former RT: 149.460 CH8 CD35 (RLL 9Sep96)

Note: na = data not available.

[1]For a description of maturity codes, see Appendix A, Table A3.

[2]G = green, P = Pink; R = red; Y = yellow

Table D2 Locations (i.e. river km) of radio-tagged white sturgeon in the Nechako River, September 2005 to March 2006.

Frequency	Channel	Code	Sex	Date of Release	Tag Type	Burst Rate	Rated Tag Life (days)	Rated END OF TAG LIFE	Release Location (Km)	2005								2006	Latest location	Date
										01-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	25-Oct	14-Mar		
										[S]	[B]	[B]	[B]	[B]	[B]	[B]	[B]	[S]		
148.320	55	2	02	06-Sep-04	MCFT-3L	5 s	1686	19-Apr-09	Stuart Lake								116.2	116.2	116.2	14-Mar-06
148.320	55	3	03	06-Sep-04	MCFT-3L	5 s	1686	19-Apr-09	Stuart Lake										Stuart Lake	06-Sep-04
148.320	55	4	02	17-Sep-02	MCFT-3L	5 s	1686	30-Apr-07	21.72[a]										21.7	17-Sep-02
148.320	55	5	17	18-Sep-02	MCFT-3L	5 s	1686	01-May-07	20.82[a]										89.7	24-Jul-04
148.380	60	1	15	07-Sep-04	MCFT-3L	5 s	1686	20-Apr-09	Stuart Lake								116.2		116.2	25-Oct-05
148.380	60	2	97	23-Sep-04	MCFT-3L	5 s	1686	06-May-09	Nechako								116.2	116.2	116.2	14-Mar-06
148.380	60	3	12	28-Sep-02	MCFT-3L	5 s	1686	11-May-07	22.81[a]						115.0		116.2	116.2	116.2	14-Mar-06
148.380	60	4	12	09-Sep-04	MCFT-3L	5 s	1686	22-Apr-09	Stuart Lake								116.2	116.2	116.2	14-Mar-06
148.380	60	5	13	07-Sep-04	MCFT-3L	5 s	1686	20-Apr-09	Stuart Lake										Stuart Lake	07-Sep-04
148.400	0	6	14	19-Sep-05	MCFT-3L	5s	1686	02-May-10	116.2							116.2	116.2	116.2	116.2	14-Mar-06
148.400	0	8	03	19-Sep-05	MCFT-3L	5s	1686	02-May-10	116.2							116.2	116.2	116.2	116.2	14-Mar-06
148.400	0	9	97	23-Sep-04	MCFT-3L	5 s	1686	06-May-09	Nechako								116.2	116.2	116.2	14-Mar-06
148.420	51	11	14	22-Jun-02	MCFT-3L	5 s	1686	02-Feb-07	90.1								116.2	116.2	116.2	14-Mar-06
148.420	51	12	03	19-Sep-02	MCFT-3L	5 s	1686	02-May-07	31.86[a]										89.7	25-Jun-04
148.420	51	14	12	27-Sep-04	MCFT-3L	5 s	1686	10-May-09	Stuart Lake					115.1			116.2		116.2	25-Oct-05
148.420	51	15	03	09-Sep-04	MCFT-3L	5 s	1686	22-Apr-09	Stuart Lake										104.2 (ST)	24-Jul-05
149.320		24	14	13-Jul-02	MCFT-3A	5 s	761	12-Aug-04	88.7										116.0	20-Oct-03
149.480	11	54	13	09-Sep-99	MCFT-7D	5 s	2964	21-Oct-07	124.6								124.7	124.6	124.6	14-Mar-06
149.700	22	1	04	15-Sep-01	MCFT-3A	5 s	761	16-Oct-03	67.0										116.0	20-Jun-04
149.700	22	2	04	01-Oct-01	MCFT-3A	5 s	761	01-Nov-03	116.8										89.7	08-Sep-04
149.700	22	3	04	23-Sep-01	MCFT-3A	5 s	761	24-Oct-03	114.9										116.0	29-Jun-04
149.700	22	4	14	22-Sep-01	MCFT-3A	5 s	761	23-Oct-03	115.2										652.1 (FR)	26-May-03
149.700	22	5	13	24-Sep-01	MCFT-3A	5 s	761	25-Oct-03	124.7										89.7	11-Jul-04
149.700	22	6	03	13-Oct-01	MCFT-3A	5 s	761	13-Nov-03	124.7										85.0	25-May-04
149.700	22	7	14	23-Sep-01	MCFT-3A	5 s	761	24-Oct-03	125.1										116.0	18-Jul-04
149.700	22	8	04	28-Sep-01	MCFT-3A	5 s	761	29-Oct-03	116.2										104.2 (ST)	26-Jun-04
149.700	22	9	04	25-Sep-01	MCFT-3A	5 s	761	26-Oct-03	116.8										104.2 (ST)	07-Jun-04
149.700	22	10	04	29-Sep-01	MCFT-3A	5 s	761	30-Oct-03	115.1										116.0	21-Jul-04
149.700	22	11	04	26-Sep-01	MCFT-3A	5 s	761	27-Oct-03	116.8										116.0	14-Jul-04
149.700	22	12	04	01-Oct-01	MCFT-3A	5 s	761	01-Nov-03	115.2										116.0	26-May-04
149.700	22	13	04	13-Oct-01	MCFT-3A	5 s	761	13-Nov-03	124.7										89.7	18-Jul-04
149.700	22	14	98	16-Sep-05	MCFT-3A	5 s	761	17-Oct-07	116.8			116.8					116.2		116.2	25-Oct-05
149.700	22	15	04	13-Oct-01	MCFT-3A	5 s	761	13-Nov-03	116.2									116.2	116.2	14-Mar-06
149.700	22	20	01	14-Sep-05	MCFT-3L	5 s	1686	27-Apr-10	125.0		125.0						124.7-124.5	124.6	124.6	14-Mar-06
149.700	22	21	01	14-Sep-05	MCFT-3L	5 s	1686	27-Apr-10	124.7		124.7						116.2	116.2	116.2	14-Mar-06
149.700	22	22	97	14-Sep-05	MCFT-3L	5 s	1686	27-Apr-10	125.0		125.0						116.2	116.2	116.2	14-Mar-06
149.700	22	23	12	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	116.8			116.8					124.7-124.5	124.6	124.6	14-Mar-06
149.700	22	24	02	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	124.7			124.7					116.2	116.2	116.2	14-Mar-06
149.700	22	25	04	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	116.2			116.2					124.7-124.5	124.6	124.6	14-Mar-06
149.700	22	26	11	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	116.2			116.2					124.7	124.6	124.6	14-Mar-06
149.700	22	27	03	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	116.2			116.2					124.7-124.5	124.6	124.6	14-Mar-06
149.700	22	28	12	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	116.2			116.2					116.2	116.2	116.2	14-Mar-06
149.700	22	29	04	15-Sep-05	MCFT-3L	5 s	1686	28-Apr-10	116.8			116.8					116.2	116.2	116.2	14-Mar-06
149.700	22	30	04	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	117.3				117.3				125.0	116.2	116.2	14-Mar-06
149.700	22	31	12	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	117.3				117.3				116.2	116.2	116.2	14-Mar-06
149.700	22	32	04	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	116.8				116.8				125.0	124.6	124.6	14-Mar-06
149.700	22	33	04	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	116.8				116.8				116.2	116.2	116.2	14-Mar-06
149.700	22	34	04	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	116.2				116.2				124.7-124.5	116.2	116.2	14-Mar-06
149.700	22	35	12	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	116.2				116.2				116.2		116.2	25-Oct-05
149.700	22	36	02	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	115.1				115.1				116.2	116.2	116.2	14-Mar-06
149.700	22	37	12	16-Sep-05	MCFT-3L	5 s	1686	29-Apr-10	114.9				114.9				124.7-124.5		124.7-124.5	25-Oct-05
149.700	22	38	03	17-Sep-05	MCFT-3L	5 s	1686	30-Apr-10	116.8					116.8			116.2	116.2	116.2	14-Mar-06
149.700	22	39	03	17-Sep-05	MCFT-3L	5 s	1686	30-Apr-10	116.2					116.2			116.2	116.2	116.2	14-Mar-06
149.700	22	40	04	17-Sep-05	MCFT-3L	5 s	1686	30-Apr-10	124.6					124.6			124.7	116.2	116.2	14-Mar-06
149.700	22	41	04	18-Sep-05	MCFT-3L	5 s	1686	01-May-10	116.8						116.8		116.2		116.2	25-Oct-05
149.700	22	42	03	18-Sep-05	MCFT-3L	5 s	1686	01-May-10	114.9						114.9			116.2	116.2	14-Mar-06
149.700	22	43	12	19-Sep-05	MCFT-3L	5 s	1686	02-May-10	116.2							116.2	116.2	116.2	116.2	14-Mar-06
149.770	50 CS2000	18	98	31-Aug-05	MCFT-3A	5 s	761	01-Oct-07	116.2								116.2	116.2	116.2	14-Mar-06
149.770	50 CS2000	26	98	01-Sep-05	MCFT-3A	5 s	761	02-Oct-07	116.2	116.2							125.0	124.6	124.6	14-Mar-06
149.800[b]	33	1	14	17-Sep-04	CART16_2s	10 s	967	12-May-07	Trembleur Lake										Trembleur Lake	17-Sep-04
149.800[b]	33	3	16	09-Sep-04	CART16_2s	10 s	967	04-May-07	Stuart Lake										90.1	08-Jul-05

Tag is 'Active Based on Rated Life (Note this is automatically updated)

Tag is Expired Based on Rated Life (Note this is automatically updated)

Time Before Tag Deployed

Juvenile based on total length or surgical observation

Fish not located during the last monitoring event.

Abbreviations: [GS] = Shore-based ground station; [S] = Shore-based telemetry; [B] = Boat telemetry; [A] Aerial telemetry; SR = Stuart River location; FR = Fraser River location.

[a]Located in Stuart lake. Distance measured from confluence of Stuart River and Nechako River. Upstream end of Stuart River is Km 110.

[b]149.800 are CART tags with a 10 second burst interval for either acoustic or radio (ie. 5 sec acoustic then 5 sec radio, etc.)

APPENDIX E

HABITAT DATA

Table E1 Summary of habitat information collected at white sturgeon capture locations, Nechako River 2005.

Station (km)[1]	Set Date	Mean Water Temp. (°C)	Depth		Visibility (m)	No. Fish Caught
			Min.	Max		
AB116.2M	19-Sep	12.2	7.9	7.9	2.50	1
AB117.0M	16-Sep	13.1	4.1	4.1	2.60	0
AB124.6M	17-Sep	14.1	6.2	6.2	na	1
AB124.7L	13-Sep	13.4	5.2	5.2	4.10	0
AB124.7R	13-Sep	13.4	6.8	7.1	4.10	0
SSL111.2R	17-Sep	13.8	3.5	6.4	3.55	0
SSL111.2R	18-Sep	12.8	3.9	6.7	3.30	0
SSL114.9R	15-Sep	13.9	3.9	5.3	2.85	1
SSL114.9R	16-Sep	13.2	4.0	5.7	3.20	0
SSL114.9R	17-Sep	13.4	3.2	5.9	3.80	2
SSL114.9R	18-Sep	12.9	3.8	5.5	2.50	0
SSL115.0R	15-Sep	13.9	2.1	3.1	2.85	0
SSL115.0R	16-Sep	13.2	2.2	3.1	3.20	0
SSL115.0R	17-Sep	13.4	2.0	3.1	3.80	1
SSL115.0R	18-Sep	12.9	2.0	3.1	2.50	0
SSL115.1R	15-Sep	13.9	4.9	5.7	2.85	1
SSL115.1R	16-Sep	13.6	5.4	5.9	3.20	1
SSL115.1R	17-Sep	13.8	5.2	5.8	3.80	0
SSL115.1R	18-Sep	12.9	5.1	5.8	2.50	0
SSL115.3R	16-Sep	13.2	2.8	3.7	3.20	2
SSL115.3R	17-Sep	13.3	3.0	4.0	3.80	1
SSL115.3R	18-Sep	12.8	2.8	4.0	2.50	1
SSL116.2L	14-Sep	15.0	3.3	7.2	3.10	4
SSL116.2L	15-Sep	13.9	3.1	7.8	2.85	2
SSL116.2L	16-Sep	13.2	3.4	6.7	3.20	1
SSL116.2L	17-Sep	13.3	3.9	6.5	3.80	1
SSL116.2L	18-Sep	12.8	3.3	7.1	na	2
SSL116.8L	14-Sep	14.7	3.8	4.9	3.10	1
SSL116.8L	15-Sep	14.1	4.0	4.9	3.10	1
SSL116.8L	15-Sep	13.9	3.8	5.0	2.85	3
SSL116.8L	16-Sep	13.2	4.3	4.9	3.20	2
SSL116.8L	17-Sep	13.3	3.2	4.9	3.80	1
SSL116.8L	18-Sep	12.8	2.0	5.0	na	0
SSL117.3L	14-Sep	14.7	1.8	4.0	3.10	0
SSL117.3L	15-Sep	13.6	1.7	4.3	2.85	2
SSL117.3L	16-Sep	13.2	2.5	4.5	3.20	0
SSL117.3L	17-Sep	13.3	2.5	4.5	3.80	1
SSL117.3L	18-Sep	12.8	1.8	4.3	2.50	1
SSL124.7R	13-Sep	13.7	3.6	7.0	4.10	1
SSL124.7R	14-Sep	14.0	4.2	6.6	3.10	1
SSL124.7R	15-Sep	13.6	2.3	6.4	3.10	0
SSL125.0L	13-Sep	14.1	5.2	7.7	4.10	0
SSL125.0L	13-Sep	14.3	4.8	7.8	4.10	2
SSL125.0L	14-Sep	14.0	3.8	8.3	na	0
SSL125.3L	13-Sep	14.1	4.1	4.5	4.10	0
SSL125.3L	13-Sep	14.3	4.1	4.5	4.10	0
SSL125.3L	14-Sep	14.0	4.2	4.5	na	0
SSL126.3R	13-Sep	13.7	2.9	4.0	4.10	0
SSL126.5L	13-Sep	13.7	1.5	1.9	4.10	0
SSL129.3L	13-Sep	13.7	2.5	3.5	na	0
SSL129.4L	12-Sep	14.7	2.1	4.1	4.10	0
SSL129.4L	13-Sep	13.7	2.9	4.2	na	0
SSL129.6L	12-Sep	14.7	4.0	5.7	4.10	0
SSL132.0R	12-Sep	14.8	3.5	8.2	4.10	0
SSL132.3R	12-Sep	16.0	2.4	4.4	4.10	0

Note: na = data not available

Table E2 Substrate and water velocity information at the two main white sturgeon overwintering areas in the Nechako River, 31 October 2005.

Site Name	Sample Location [1]	UTM Coordinates			Site (Km)	Depth (m)		Substrate	Velocity (m/s)[2]			Temperature (°C)	
		Grid Zone	Easting	Northing		Minimum	Maximum		Mean	Min.	Max.	Air	Water
Km 116.2	Upstream	10U	445501	5982338	116.0	3.1	3.2	Fine sand	0.51	0.49	0.53	9.4	4.8
Overwintering	Middle	10U	445603	5982269	116.2	8.5	8.6	Fine sand, coarse sand, gravel	0.10	0.10	0.10		
area	Downstream	10U	445735	5982298	116.25	3.6	4.8	Fine sand, coarse sand, gravel	0.51	0.50	0.51		
Km 124.7	Upstream	10U	439696	5984675	124.6	5.6	6.5	Too compacted	0.45	0.45	0.45		
Overwintering	Middle	10U	439836	5984975	124.7	6.3	7.6	Hard clay, sand	0.35	0.24	0.44		
area	Downstream	10U	439839	5985196	125.0	6.5	6.6	Too compacted	0.56	0.48	0.63	11.3	5.1

[1]Measurements were taken upstream from the main overwintering pool, in the middle of the pool, and downstream from main pool.

[2]Velocity taken 1.5 m from the water surface.

Table E3 Bathymetric information at transects conducted in the Nechako River (around Km 116.2 and Km 124.7), 25 October 2005.

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 116.2 Overwintering Area					
E-line (longitudinal transect conducted from us[3] to ds)					
10U	445681	5982294	4:31:52	0.00	3.3
10U	445675	5982291	4:31:57	6.71	3.4
10U	445670	5982289	4:32:02	12.09	3.3
10U	445663	5982289	4:32:07	19.09	3.7
10U	445655	5982287	4:32:12	27.34	4.1
10U	445647	5982287	4:32:17	35.34	4.2
10U	445640	5982289	4:32:22	42.62	4.3
10U	445632	5982289	4:32:27	50.62	4.3
10U	445623	5982290	4:32:32	59.68	4.2
10U	445616	5982290	4:32:37	66.68	4.4
10U	445608	5982290	4:32:42	74.68	4.3
10U	445599	5982290	4:32:48	83.68	4.7
10U	445589	5982290	4:32:54	93.68	4.9
10U	445580	5982292	4:33:00	102.89	4.8
10U	445570	5982293	4:33:06	112.94	4.6
10U	445563	5982293	4:33:11	119.94	4.4
10U	445554	5982295	4:33:16	129.16	4.1
10U	445546	5982295	4:33:21	137.16	3.6
10U	445536	5982298	4:33:27	147.60	3.9
10U	445529	5982298	4:33:32	154.60	3.8
10U	445521	5982300	4:33:37	162.85	3.7
10U	445512	5982303	4:33:42	172.34	3.4
10U	445502	5982305	4:33:48	182.54	3.2
10U	445495	5982308	4:33:53	190.15	3
10U	445487	5982310	4:33:58	198.40	2.6
10U	445481	5982313	4:34:02	205.11	1.9
10U	445470	5982318	4:34:08	217.19	1.6
10U	445463	5982323	4:34:13	225.79	1.7
10U	445455	5982335	4:34:22	240.21	2
10U	445453	5982344	4:34:32	249.43	2.2
10U	445451	5982347	4:34:37	253.04	2.3
10U	445451	5982347	4:34:40	253.04	2.4
Transect 1 (cross-section transect conducted from rdb to ldb)					
10U	445447	5982366	4:38:25	0.00	1.9
10U	445448	5982363	4:38:30	3.16	2
10U	445448	5982361	4:38:33	5.16	2.2
10U	445451	5982351	4:38:42	15.60	2.4
10U	445451	5982344	4:38:49	22.60	2.4
10U	445451	5982337	4:38:54	29.60	2.2
10U	445451	5982332	4:38:59	34.60	2.2
10U	445450	5982325	4:39:04	41.67	2.2
10U	445450	5982320	4:39:09	46.67	2.4
10U	445450	5982313	4:39:14	53.67	2.4
10U	445452	5982308	4:39:19	59.06	2.3
10U	445454	5982304	4:39:24	63.53	2.3
10U	445456	5982296	4:39:29	71.78	2.2
10U	445457	5982292	4:39:34	75.90	2.4
10U	445460	5982287	4:39:39	81.73	2.7
10U	445463	5982282	4:39:44	87.56	2.9
10U	445465	5982280	4:39:49	90.39	2.9
10U	445468	5982279	4:39:54	93.55	3.2

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 116.2 Overwintering Area					
Transect 2 (cross-section transect conducted from ldb to rdb)					
10U	445468	5982279	4:39:54	0.00	3.2
10U	445472	5982284	4:39:59	6.40	3.4
10U	445477	5982289	4:40:04	13.47	3.4
10U	445481	5982294	4:40:09	19.88	2.9
10U	445485	5982298	4:40:14	25.53	2.2
10U	445488	5982303	4:40:19	31.37	2
10U	445492	5982308	4:40:24	37.77	2.5
10U	445497	5982313	4:40:29	44.84	2.6
10U	445501	5982320	4:40:34	52.90	2.7
10U	445507	5982324	4:40:39	60.11	2.7
10U	445511	5982329	4:40:44	66.52	2.6
10U	445517	5982334	4:40:49	74.33	2.8
10U	445522	5982339	4:40:54	81.40	2.7
10U	445527	5982343	4:40:59	87.80	2.4
10U	445534	5982348	4:41:04	96.40	1.5
10U	445538	5982348	4:41:09	100.40	0.7
10U	445539	5982345	4:41:14	103.56	0.7
Transect 3 (cross-section transect conducted from rdb to ldb)					
10U	445539	5982345	4:41:14	0.00	0.7
10U	445541	5982341	4:41:19	4.47	0.7
10U	445542	5982334	4:41:24	11.54	1.1
10U	445543	5982329	4:41:29	16.64	2.5
10U	445546	5982322	4:41:34	24.26	2.7
10U	445547	5982317	4:41:38	29.36	3
10U	445550	5982310	4:41:44	36.97	3.3
10U	445553	5982305	4:41:49	42.80	3.9
10U	445556	5982298	4:41:54	50.42	3.8
10U	445558	5982293	4:41:59	55.80	3.9
10U	445561	5982288	4:42:04	61.64	4.4
10U	445564	5982281	4:42:09	69.25	4.5
10U	445567	5982276	4:42:14	75.08	4.3
10U	445572	5982271	4:42:19	82.15	4.3
10U	445576	5982266	4:42:24	88.56	4.5
10U	445582	5982261	4:42:29	96.37	4.6
10U	445588	5982254	4:42:34	105.59	4.8
10U	445593	5982249	4:42:39	112.66	4.8
10U	445600	5982242	4:42:44	122.56	4.8
10U	445606	5982237	4:42:49	130.37	4.4
10U	445613	5982237	4:42:54	137.37	3.7
Transect 4 (cross-section transect conducted from ldb to rdb)					
10U	445613	5982237	4:42:54	0.00	3.7
10U	445617	5982240	4:42:59	5.00	4.2
10U	445621	5982247	4:43:04	13.06	5.5
10U	445626	5982254	4:43:09	21.66	6.8
10U	445628	5982261	4:43:14	28.94	5.5
10U	445633	5982268	4:43:19	37.55	4.5
10U	445634	5982275	4:43:24	44.62	4.5
10U	445634	5982285	4:43:29	54.62	4.4
10U	445634	5982292	4:43:34	61.62	4.3
10U	445636	5982299	4:43:39	68.90	3.9
10U	445637	5982306	4:43:44	75.97	3.6

[1]UTM coordinates are in NAD 83.

[2]Cumulative distance is calculated from the first point of the transect.

[3]us = upstream; ds = downstream; ldb = left downstream bank; rdb = right downstream bank; moc = middle of channel.

Table E3 Continued.

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 116.2 Overwintering Area					
Transect 4 (continued)					
10U	445640	5982313	4:43:49	83.59	3.2
10U	445645	5982318	4:43:54	90.66	3.1
10U	445647	5982325	4:43:59	97.94	2.7
10U	445653	5982330	4:44:04	105.75	2.1
10U	445657	5982330	4:44:10	109.75	1.1
10U	445662	5982325	4:44:15	116.82	0.9
Transect 5 (cross-section transect conducted from rdb to ldb)					
10U	445662	5982325	4:44:15	0.00	0.9
10U	445666	5982320	4:44:20	6.40	1
10U	445670	5982315	4:44:25	12.81	2.5
10U	445675	5982313	4:44:30	18.19	3
10U	445680	5982306	4:44:35	26.79	3.6
10U	445685	5982301	4:44:40	33.86	3.3
10U	445689	5982296	4:44:45	40.27	3.3
10U	445693	5982291	4:44:50	46.67	3.5
10U	445698	5982286	4:44:55	53.74	3.8
10U	445702	5982282	4:45:00	59.40	4.2
10U	445705	5982279	4:45:04	63.64	4.4
10U	445709	5982274	4:45:10	70.04	4.2
10U	445713	5982269	4:45:15	76.45	3.7
10U	445717	5982267	4:45:20	80.92	3
10U	445720	5982262	4:45:25	86.75	2.5
10U	445723	5982260	4:45:30	90.36	1.9
10U	445723	5982260	4:45:35	90.36	1.8
Transect 6 (from left downstream bank to right downstream bank)					
10U	445723	5982260	4:45:35	0.00	1.8
10U	445721	5982265	4:45:40	5.39	2.2
10U	445721	5982272	4:45:45	12.39	3.1
10U	445723	5982279	4:45:50	19.67	3.9
10U	445723	5982286	4:45:55	26.67	4.2
10U	445724	5982293	4:46:00	33.74	4.2
10U	445727	5982298	4:46:05	39.57	4.2
10U	445730	5982305	4:46:10	47.18	3.6
10U	445733	5982312	4:46:15	54.80	1.7
10U	445736	5982317	4:46:20	60.63	1.7
10U	445739	5982315	4:46:25	64.24	0.5
Km 124.7 Overwintering Area					
E-line (longitudinal transect conducted from ds to us)					
10U	439706	5984683	5:14:05	0.00	6.7
10U	439705	5984686	5:14:10	3.16	6.6
10U	439702	5984691	5:14:15	8.99	6.6
10U	439699	5984696	5:14:20	14.82	6.5
10U	439698	5984703	5:14:25	21.90	5.5
10U	439694	5984710	5:14:30	29.96	4.7
10U	439692	5984717	5:14:35	37.24	3.8
10U	439688	5984722	5:14:40	43.64	3.6
10U	439686	5984729	5:14:45	50.92	3.8
10U	439684	5984736	5:14:50	58.20	4
10U	439683	5984743	5:14:55	65.27	3.9
10U	439682	5984751	5:15:00	73.33	3.9
10U	439682	5984758	5:15:05	80.33	4

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 124.7 Overwintering Area					
E-line (continued)					
10U	439683	5984765	5:15:10	87.41	4.2
10U	439685	5984772	5:15:15	94.69	4.5
10U	439685	5984779	5:15:20	101.69	4.1
10U	439686	5984789	5:15:25	111.74	4.2
10U	439688	5984796	5:15:30	119.02	4.7
10U	439689	5984803	5:15:35	126.09	5.4
10U	439692	5984810	5:15:40	133.70	5.8
10U	439694	5984817	5:15:45	140.98	5.1
10U	439697	5984824	5:15:50	148.60	5.3
10U	439701	5984832	5:15:55	157.54	6.1
10U	439704	5984839	5:16:00	165.16	6.9
10U	439708	5984843	5:16:05	170.82	7.3
10U	439712	5984851	5:16:10	179.76	6.6
10U	439717	5984858	5:16:15	188.36	6.6
10U	439722	5984862	5:16:20	194.76	6.9
10U	439727	5984869	5:16:25	203.37	7.1
10U	439732	5984874	5:16:30	210.44	7.4
10U	439737	5984881	5:16:35	219.04	7.7
10U	439742	5984886	5:16:40	226.11	7.7
10U	439747	5984893	5:16:45	234.71	7.4
10U	439752	5984898	5:16:50	241.78	7.1
10U	439757	5984905	5:16:55	250.39	7.1
10U	439762	5984910	5:17:00	257.46	7.1
10U	439767	5984917	5:17:05	266.06	7.1
10U	439772	5984921	5:17:10	272.46	7.2
10U	439777	5984929	5:17:15	281.90	7.2
10U	439781	5984933	5:17:20	287.55	6.7
10U	439785	5984940	5:17:25	295.62	6.2
10U	439790	5984947	5:17:30	304.22	6.3
10U	439794	5984955	5:17:35	313.16	7.4
10U	439797	5984964	5:17:40	322.65	7.4
10U	439800	5984971	5:17:45	330.27	6.3
10U	439804	5984978	5:17:50	338.33	5.7
10U	439807	5984988	5:17:55	348.77	4.7
10U	439811	5984995	5:18:00	356.83	4
10U	439814	5985002	5:18:05	364.45	3.8
10U	439819	5985009	5:18:10	373.05	3.9
10U	439821	5985016	5:18:15	380.33	4.2
10U	439824	5985023	5:18:20	387.94	4.6
10U	439829	5985030	5:18:25	396.55	4.4
10U	439832	5985038	5:18:30	405.09	5.4
10U	439834	5985045	5:18:35	412.37	5.7
10U	439836	5985054	5:18:40	421.59	5.8
10U	439839	5985061	5:18:45	429.21	5.6
10U	439842	5985069	5:18:50	437.75	4.3
10U	439843	5985078	5:18:55	446.81	4.1
10U	439845	5985085	5:19:00	454.09	4.1
10U	439845	5985092	5:19:05	461.09	4
10U	439845	5985100	5:19:10	469.09	4
10U	439847	5985109	5:19:15	478.31	3.9
10U	439848	5985116	5:19:20	485.38	4

[1]UTM coordinates are in NAD 83.

[2]Cumulative distance is calculated from the first point of the transect.

[3]us = upstream; ds = downstream; ldb = left downstream bank; rdb = right downstream bank; moc = middle of channel.

Table E3 Continued.

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 124.7 Overwintering Area					
E-line (continued)					
10U	439848	5985123	5:19:25	492.38	4.3
10U	439848	5985133	5:19:30	502.38	4.4
10U	439848	5985140	5:19:35	509.38	4.7
10U	439850	5985150	5:19:40	519.57	5
10U	439850	5985157	5:19:45	526.57	5.5
10U	439850	5985164	5:19:50	533.57	5.6
10U	439850	5985173	5:19:55	542.57	5.7
10U	439849	5985181	5:20:00	550.64	5.7
10U	439848	5985188	5:20:05	557.71	5.8
10U	439846	5985197	5:20:10	566.93	6
10U	439845	5985205	5:20:15	574.99	6.3
10U	439845	5985212	5:20:20	581.99	6.2
10U	439842	5985219	5:20:25	589.61	6.3
10U	439841	5985224	5:20:30	594.70	6.5
10U	439840	5985226	5:20:35	596.94	6.6
10U	439837	5985231	5:20:40	602.77	6.5
10U	439834	5985236	5:20:45	608.60	6.6
10U	439833	5985243	5:20:50	615.67	6.5
10U	439829	5985250	5:20:55	623.74	6.3
10U	439825	5985257	5:21:00	631.80	6.2
10U	439822	5985265	5:21:05	640.34	5.9
10U	439818	5985272	5:21:10	648.40	5.7
10U	439814	5985279	5:21:15	656.47	5.3
10U	439808	5985286	5:21:20	665.69	5.2
10U	439804	5985293	5:21:25	673.75	4.9
10U	439798	5985301	5:21:30	683.75	4.5
10U	439796	5985308	5:21:35	691.03	4.3
10U	439790	5985315	5:21:40	700.25	4
10U	439787	5985322	5:21:45	707.86	3.8
10U	439785	5985327	5:21:50	713.25	3.6
10U	439783	5985330	5:21:55	716.85	3.5
10U	439782	5985334	5:21:59	720.98	3.5
10U	439779	5985334	5:22:05	723.98	3.4
10U	439779	5985334	5:22:07	723.98	3.4
Transect 1 (cross-section transect conducted from moc to ldb)					
10U	439776	5985339	5:24:13	0.00	3.4
10U	439785	5985337	5:24:18	9.22	3.4
10U	439792	5985334	5:24:23	16.84	3.7
10U	439799	5985332	5:24:28	24.12	4.1
10U	439806	5985329	5:24:32	31.73	4.5
10U	439814	5985327	5:24:38	39.98	4.8
10U	439821	5985324	5:24:43	47.59	4.1
10U	439827	5985319	5:24:48	55.40	2.3
10U	439828	5985315	5:24:53	59.53	0.7
Transect 2 (cross-section transect conducted from ldb to rdb)					
10U	439828	5985315	5:24:53	0.00	0.7
10U	439828	5985310	5:24:58	5.00	1.3
10U	439828	5985305	5:25:03	10.00	2.7
10U	439827	5985298	5:25:08	17.07	4.5
10U	439824	5985291	5:25:13	24.69	5
10U	439822	5985284	5:25:18	31.97	5

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 124.7 Overwintering Area					
Transect 2 (continued)					
10U	439819	5985277	5:25:23	39.58	5.1
10U	439816	5985269	5:25:28	48.13	5.3
10U	439815	5985262	5:25:33	55.20	5.4
10U	439812	5985255	5:25:38	62.81	5.1
10U	439810	5985248	5:25:43	70.09	4.2
10U	439807	5985241	5:25:48	77.71	3.6
10U	439806	5985234	5:25:53	84.78	2.9
10U	439803	5985227	5:25:58	92.40	2.3
10U	439803	5985219	5:26:03	100.40	1.8
10U	439802	5985212	5:26:08	107.47	1.6
10U	439800	5985205	5:26:13	114.75	1.1
Transect 3 (cross-section transect conducted from rdb to ldb)					
10U	439800	5985205	5:26:13	0.00	1.1
10U	439803	5985200	5:26:18	5.83	1.2
10U	439807	5985196	5:26:23	11.49	1.2
10U	439812	5985191	5:26:28	18.56	1.6
10U	439818	5985186	5:26:33	26.37	1.9
10U	439824	5985179	5:26:38	35.59	2.8
10U	439829	5985174	5:26:43	42.66	3.5
10U	439836	5985169	5:26:48	51.26	4.1
10U	439842	5985162	5:26:53	60.48	4.4
10U	439849	5985157	5:26:58	69.08	5
10U	439854	5985150	5:27:03	77.69	5.6
10U	439861	5985145	5:27:08	86.29	6.1
10U	439865	5985137	5:27:13	95.23	5.6
10U	439868	5985128	5:27:18	104.72	4.7
Transect 4 (cross-section transect conducted from ldb to rdb)					
10U	439868	5985128	5:27:18	0.00	4.7
10U	439866	5985121	5:27:23	7.28	5.5
10U	439865	5985114	5:27:28	14.35	6.6
10U	439861	5985106	5:27:33	23.30	7.2
10U	439858	5985102	5:27:38	28.30	6.8
10U	439852	5985095	5:27:43	37.51	6
10U	439848	5985088	5:27:48	45.58	5
10U	439842	5985083	5:27:53	53.39	4.2
10U	439836	5985076	5:27:58	62.61	3.5
10U	439832	5985069	5:28:03	70.67	2.9
10U	439826	5985064	5:28:08	78.48	2.4
10U	439821	5985057	5:28:13	87.08	2.4
10U	439815	5985052	5:28:18	94.89	2.4
10U	439808	5985050	5:28:23	102.17	2
10U	439804	5985045	5:28:28	108.58	1.1
10U	439798	5985043	5:28:33	114.90	1
10U	439795	5985040	5:28:38	119.14	0.7
10U	439796	5985038	5:28:43	121.38	0.6
Transect 5 (cross-section transect conducted from rdb to ldb)					
10U	439796	5985038	5:28:43	0.00	0.6
10U	439799	5985033	5:28:48	5.83	0.7
10U	439802	5985028	5:28:53	11.66	1.5
10U	439805	5985024	5:28:58	16.66	2.1
10U	439807	5985019	5:29:03	22.05	2.6

[1]UTM coordinates are in NAD 83.

[2]Cumulative distance is calculated from the first point of the transect.

[3]us = upstream; ds = downstream; ldb = left downstream bank; rdb = right downstream bank; moc = middle of channel.

Table E3 Continued.

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 124.7 Overwintering Area					
Transect 5 (continued)					
10U	439810	5985012	5:29:08	29.66	2.9
10U	439813	5985004	5:29:13	38.21	3.1
10U	439816	5984997	5:29:18	45.82	3.6
10U	439820	5984990	5:29:23	53.88	4.8
10U	439822	5984983	5:29:28	61.16	6.1
10U	439824	5984976	5:29:33	68.45	7.6
10U	439824	5984968	5:29:38	76.45	6.8
10U	439825	5984959	5:29:43	85.50	4.1
10U	439823	5984954	5:29:48	90.89	2.2
10U	439821	5984952	5:29:53	93.71	1.7
Transect 6 (cross-section transect conducted from ldb to rdb)					
10U	439821	5984952	5:29:53	0.00	1.7
10U	439816	5984949	5:29:58	5.83	2
10U	439811	5984947	5:30:03	11.22	6.9
10U	439805	5984945	5:30:08	17.54	8.1
10U	439799	5984943	5:30:13	23.87	8
10U	439794	5984938	5:30:18	30.94	7.5
10U	439787	5984936	5:30:23	38.22	7
10U	439780	5984933	5:30:28	45.83	6.7
10U	439774	5984931	5:30:33	52.16	6.7
10U	439767	5984929	5:30:38	59.44	6.2
10U	439760	5984926	5:30:43	67.05	5.7
10U	439754	5984924	5:30:48	73.38	5.3
10U	439747	5984924	5:30:53	80.38	5.2
10U	439741	5984922	5:30:58	86.70	4.8
10U	439734	5984920	5:31:03	93.98	4.4
10U	439729	5984920	5:31:08	98.98	3.4
10U	439725	5984920	5:31:13	102.98	2.3
10U	439720	5984920	5:31:18	107.98	1.4
10U	439719	5984917	5:31:23	111.14	0.8
Transect 7 (cross-section transect conducted from rdb to ldb)					
10U	439719	5984917	5:31:23	0.00	0.8
10U	439720	5984915	5:31:28	2.24	1.1
10U	439722	5984913	5:31:33	5.06	1.6
10U	439723	5984908	5:31:38	10.16	2.4
10U	439726	5984901	5:31:43	17.78	3.9
10U	439727	5984893	5:31:48	25.84	5
10U	439728	5984886	5:31:53	32.91	6.1
10U	439731	5984879	5:31:58	40.53	7
10U	439732	5984872	5:32:03	47.60	7.6
10U	439734	5984865	5:32:08	54.88	7.7
10U	439736	5984857	5:32:13	63.13	7.7
10U	439736	5984853	5:32:18	67.13	7.2
10U	439739	5984845	5:32:23	75.67	6.9
10U	439740	5984838	5:32:28	82.74	5.2
10U	439740	5984833	5:32:32	87.74	3.1
10U	439737	5984829	5:32:38	92.74	2.3
Transect 8 (cross-section transect conducted from ldb to rdb)					
10U	439737	5984829	5:32:38	0.00	2.3
10U	439735	5984829	5:32:43	2.00	2.4
10U	439729	5984826	5:32:48	8.71	2.5

UTM Coordinates[1]			Time	Cumulative Distance[2] (m)	Depth (m)
Grid Zone	Easting	Northing			
Km 124.7 Overwintering Area					
Transect 8 (continued)					
10U	439723	5984827	5:32:53	14.79	4.2
10U	439718	5984824	5:32:58	20.62	5.6
10U	439712	5984824	5:33:03	26.62	6.1
10U	439706	5984822	5:33:08	32.95	6.4
10U	439701	5984822	5:33:13	37.95	6.2
10U	439695	5984820	5:33:18	44.27	5.8
10U	439688	5984817	5:33:23	51.89	5.4
10U	439682	5984818	5:33:28	57.97	5.7
10U	439677	5984818	5:33:33	62.97	5.3
10U	439671	5984815	5:33:38	69.68	5.3
10U	439667	5984811	5:33:43	75.33	5.2
10U	439664	5984806	5:33:48	81.17	4.9
10U	439663	5984801	5:33:53	86.26	4.5
Transect 9 (cross-section transect conducted from rdb to ldb)					
10U	439663	5984801	5:33:53	0.00	4.5
10U	439662	5984796	5:33:58	5.10	4.6
10U	439664	5984791	5:34:03	10.48	4.9
10U	439667	5984787	5:34:08	15.48	5.4
10U	439668	5984782	5:34:13	20.58	5.3
10U	439671	5984777	5:34:18	26.41	5.2
10U	439675	5984772	5:34:23	32.82	5.5
10U	439678	5984767	5:34:28	38.65	5.7
10U	439680	5984763	5:34:33	43.12	5.3
10U	439683	5984758	5:34:38	48.95	4.6
10U	439687	5984753	5:34:43	55.35	4.4
10U	439691	5984751	5:34:48	59.83	4.1
10U	439697	5984746	5:34:53	67.64	3.9
10U	439701	5984743	5:34:58	72.64	3.4

[1]UTM coordinates are in NAD 83.

[2]Cumulative distance is calculated from the first point of the transect.

[3]us = upstream; ds = downstream; ldb = left downstream bank; rdb = right downstream bank; moc = middle of channel.

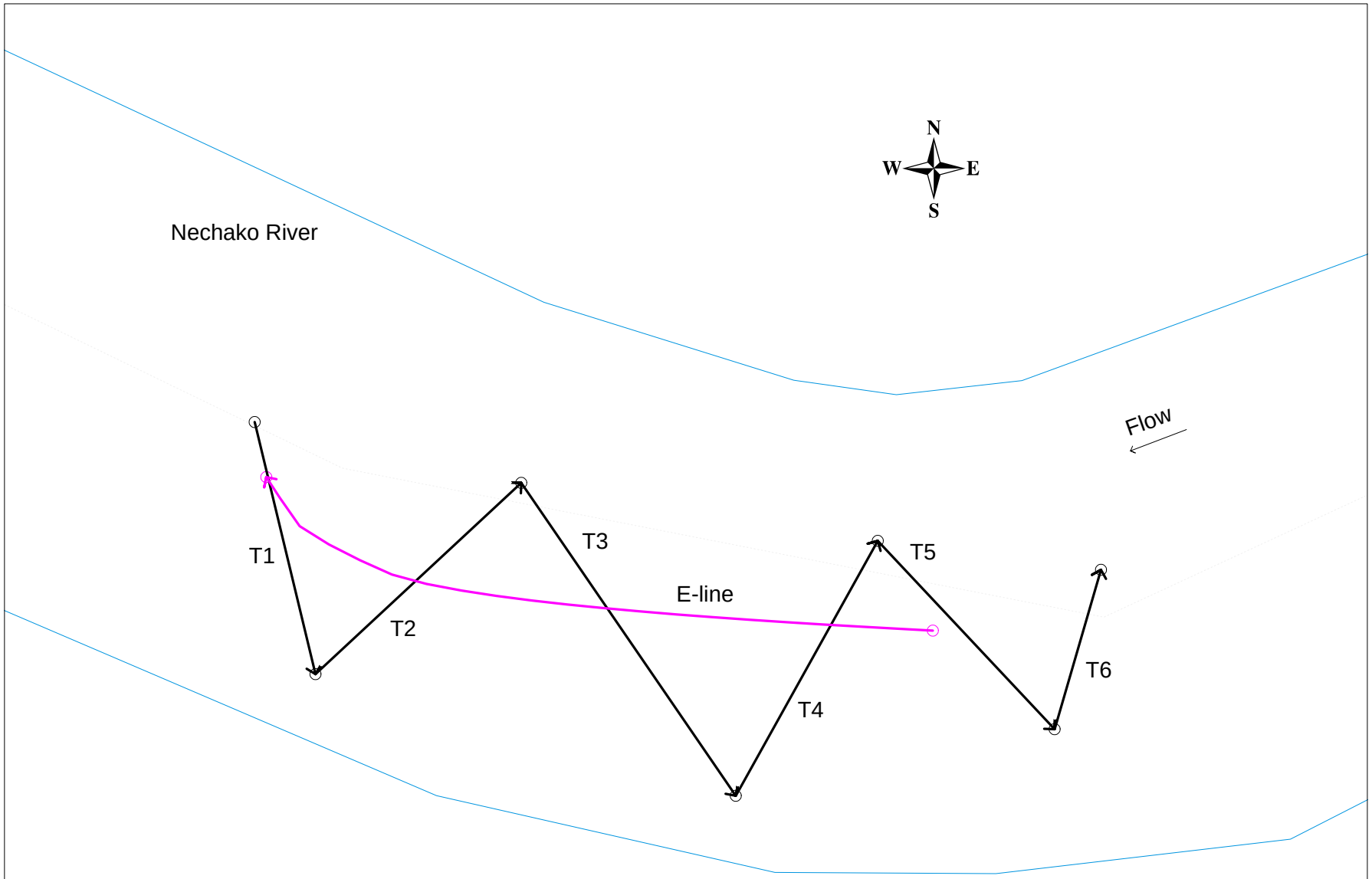
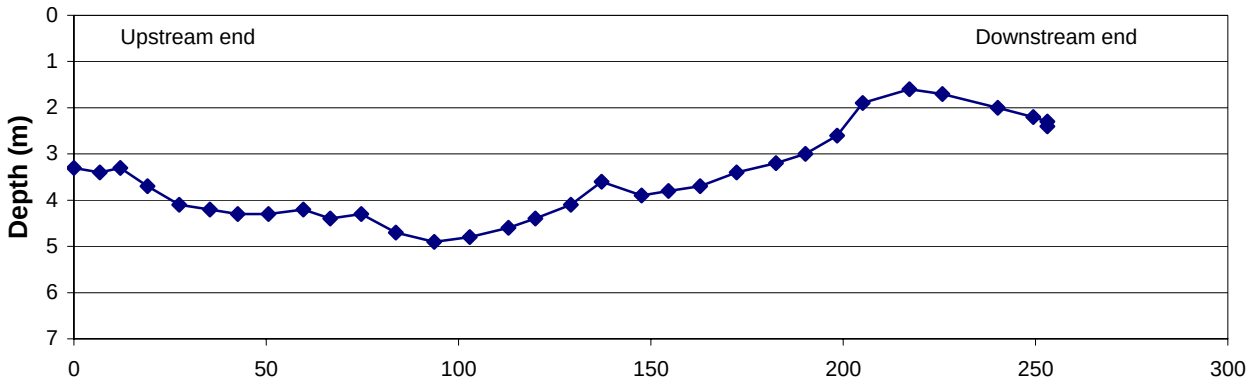
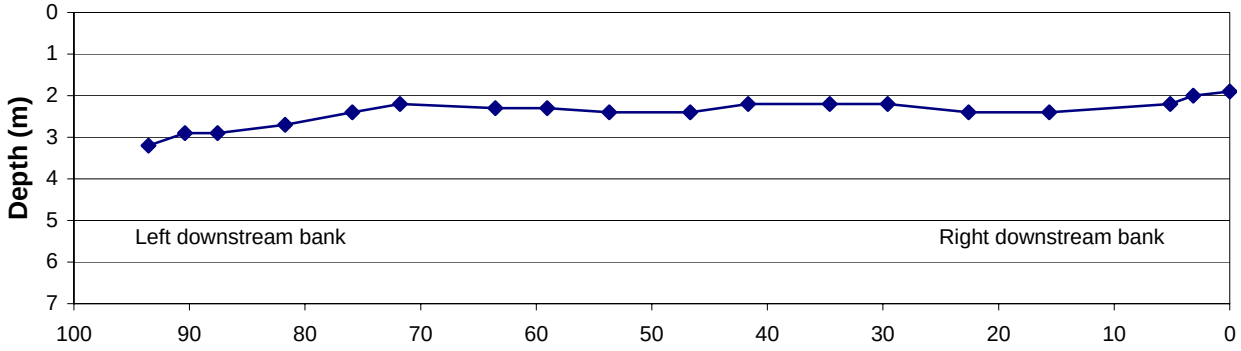


Figure E1 Location of bathymetric transects conducted in the Km 116.2 overwintering area, Nechako River, 25 October 2005.

E-line
(Longitudinal transect conducted from upstream to downstream)



T1
(Cross-section transect conducted from
right downstream bank to left downstream bank)



T2
(Cross-section transect conducted from
left downstream bank to right downstream bank)

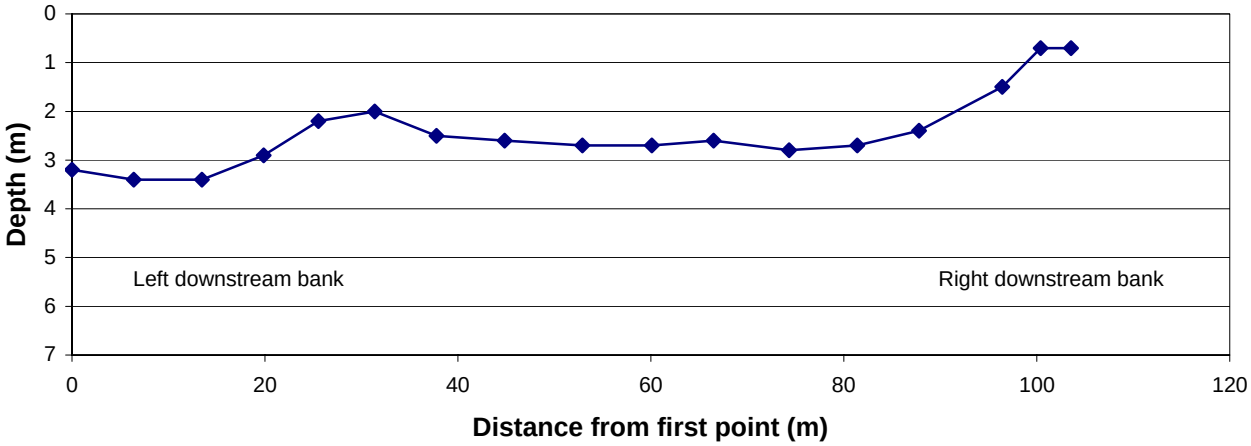
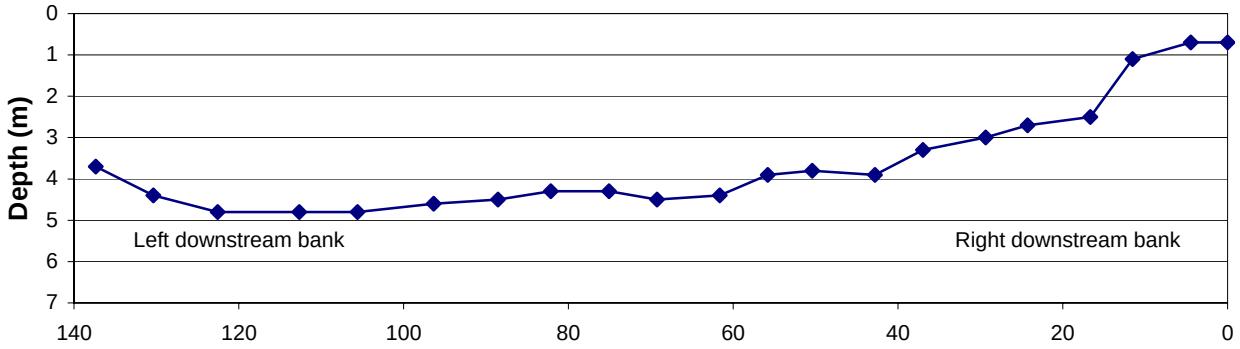
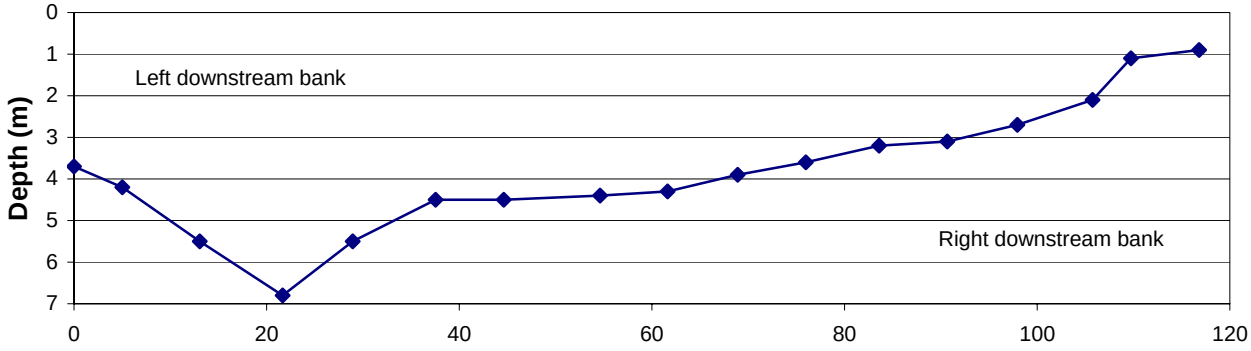


Figure E2 Bathymetric transects conducted in the Km 116.2 overwintering area, Nechako River, 25 October 2005.

T-3
(Cross-section transect conducted from
right downstream bank to left downstream bank)



T4
(Cross-section transect conducted from
left downstream bank to right downstream bank)



T5
(Cross-section transect conducted from
right downstream bank to left downstream bank)

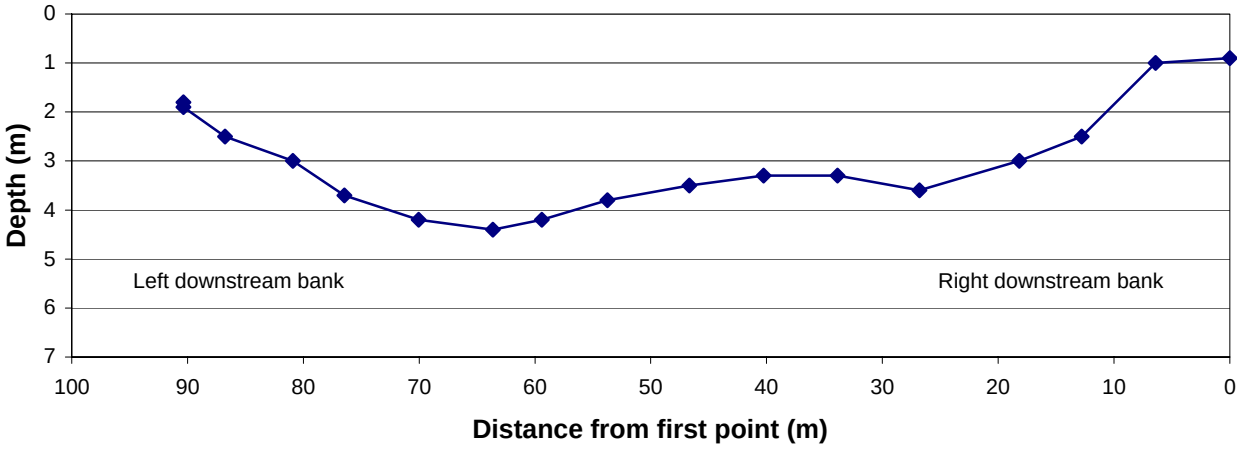


Figure E2 Continued.

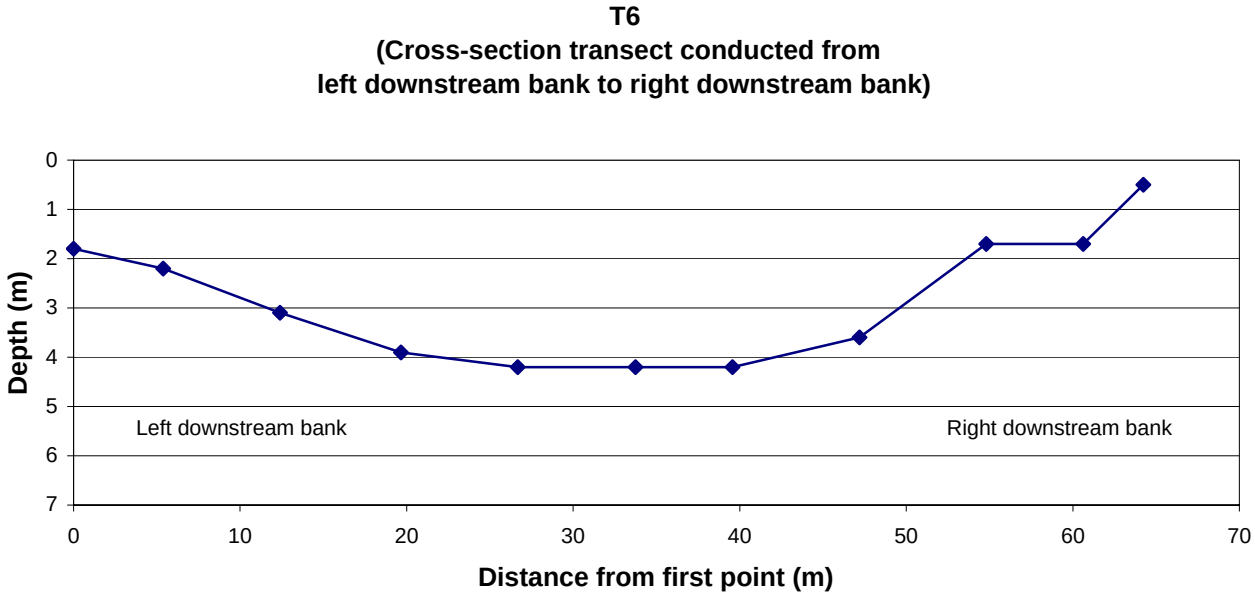


Figure E2 Continued.

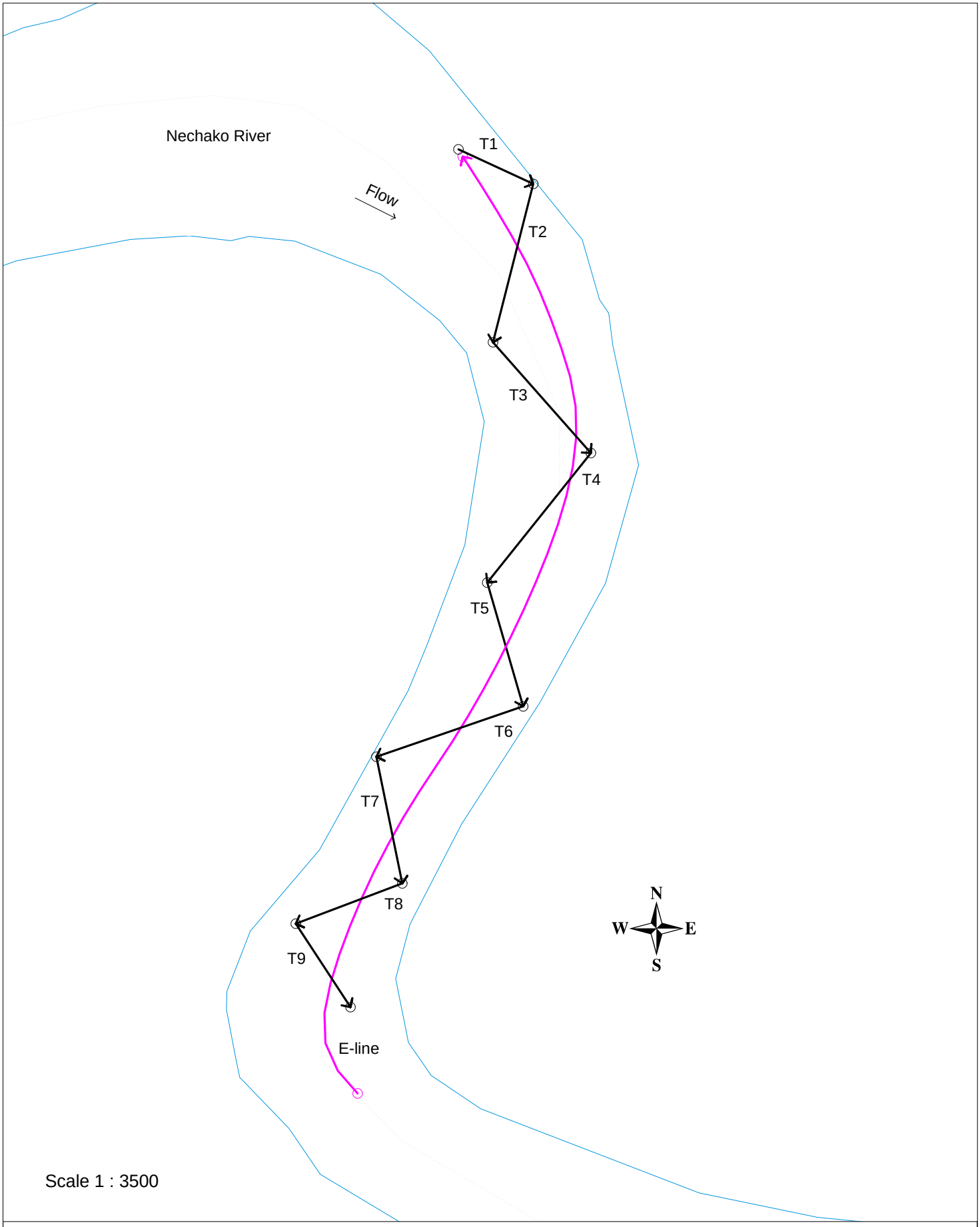
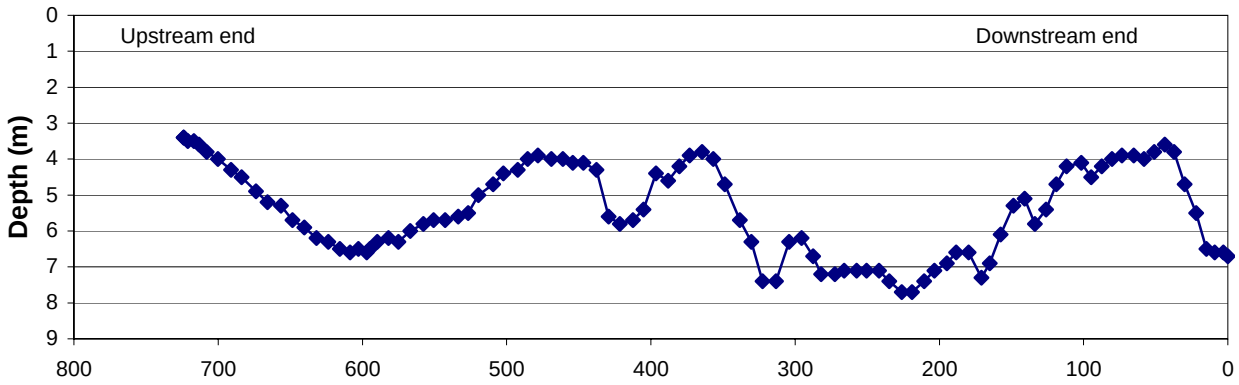
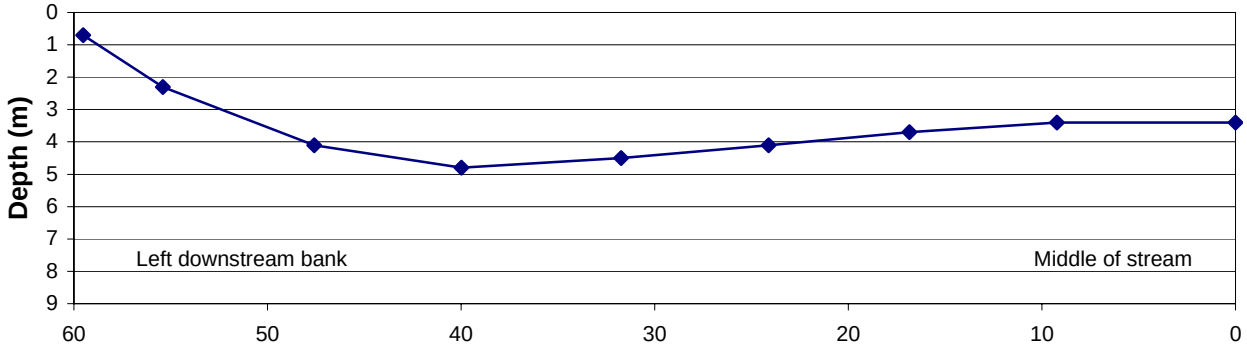


Figure E3 Location of bathymetric transects conducted in the Km 124.7 overwintering area, Nechako River, 25 October 2005.

E-line
(Longitudinal transect conducted from downstream to upstream)



T1
(Cross-section transect conducted from middle of stream to left downstream bank)



T2
(Cross-section transect conducted from left downstream bank to right downstream bank)

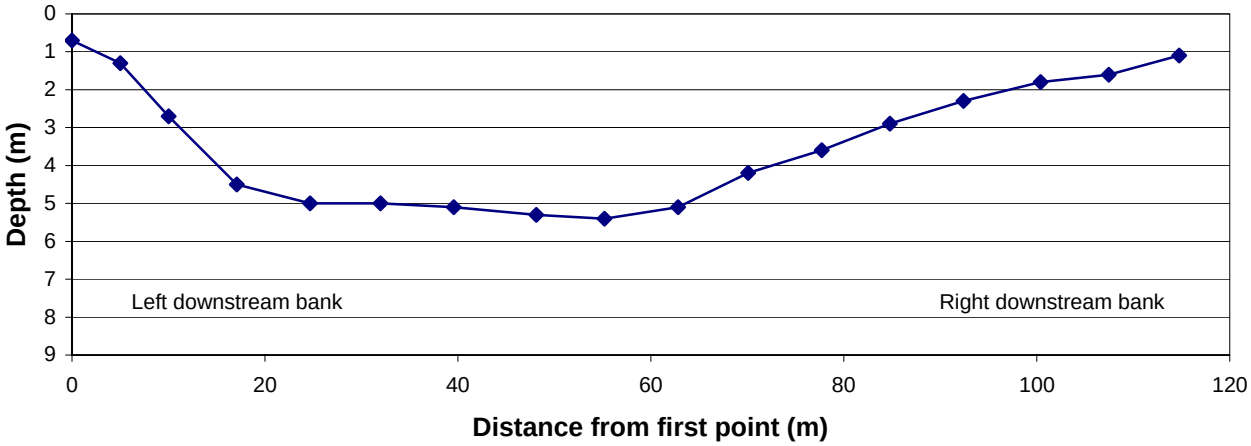
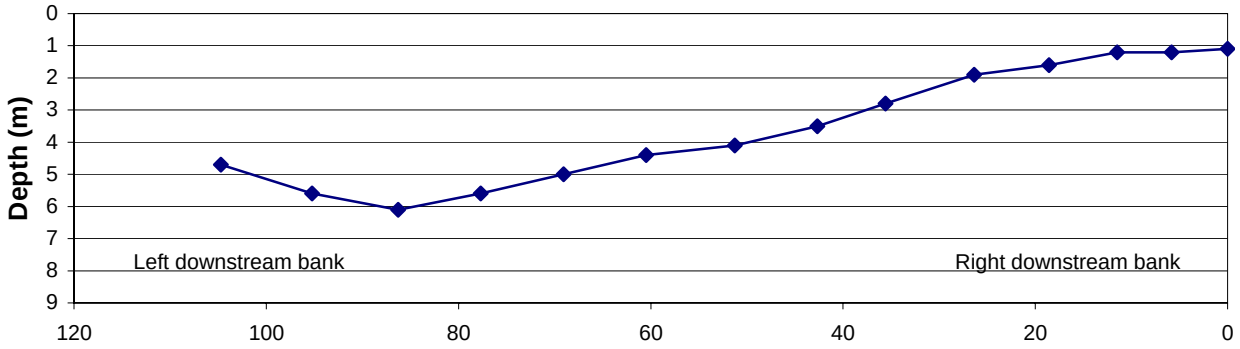
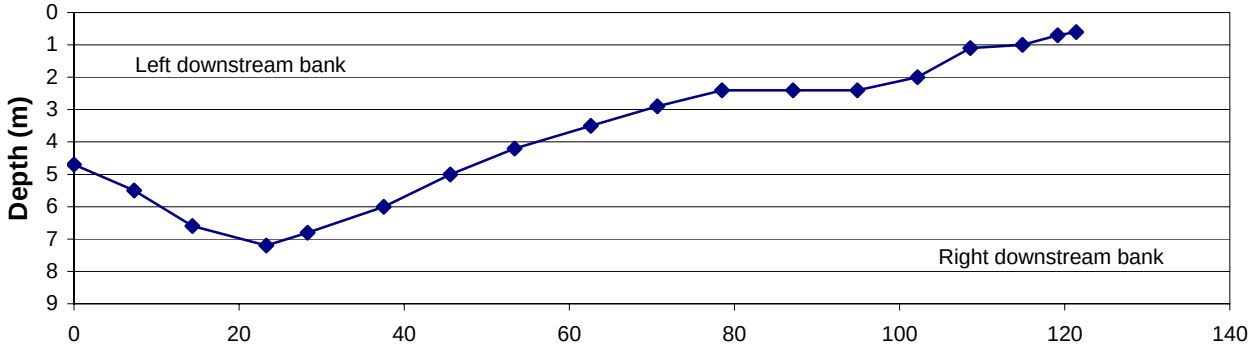


Figure E4 Bathymetric transects conducted in the Km 124.7 overwintering area, Nechako River, 25 October 2005.

T-3
(Cross-section transect conducted from
right downstream bank to left downstream bank)



T4
(Cross-section transect conducted from
left downstream bank to right downstream bank)



T5
(Cross-section transect conducted from
right downstream bank to left downstream bank)

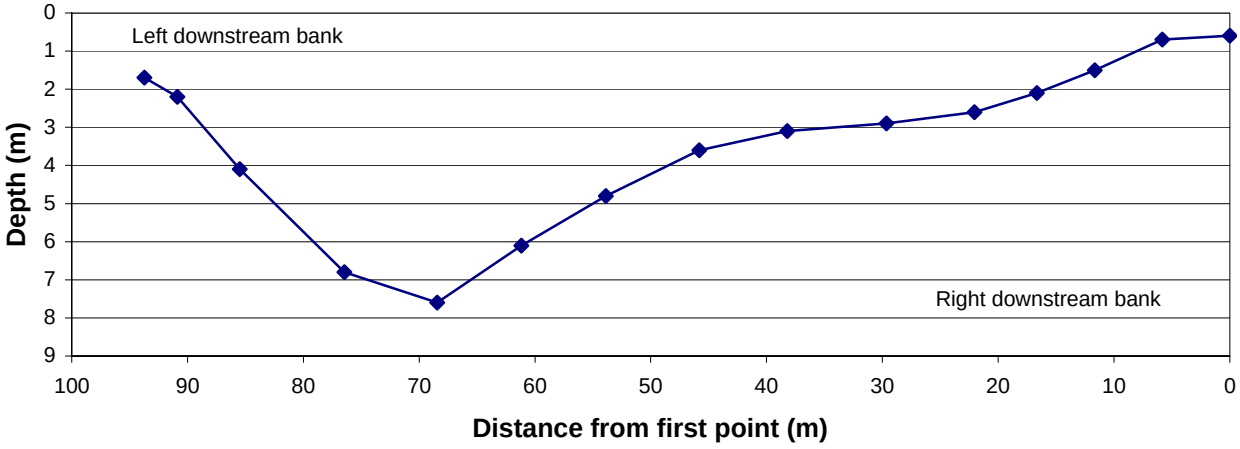
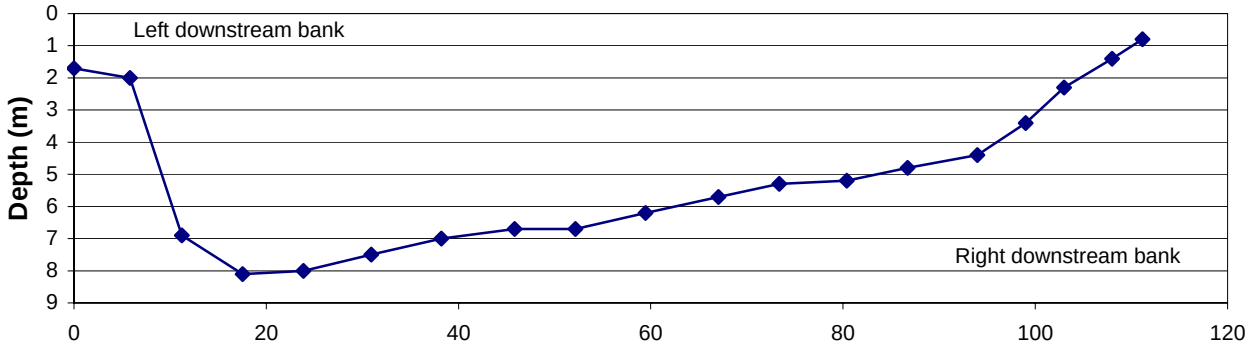
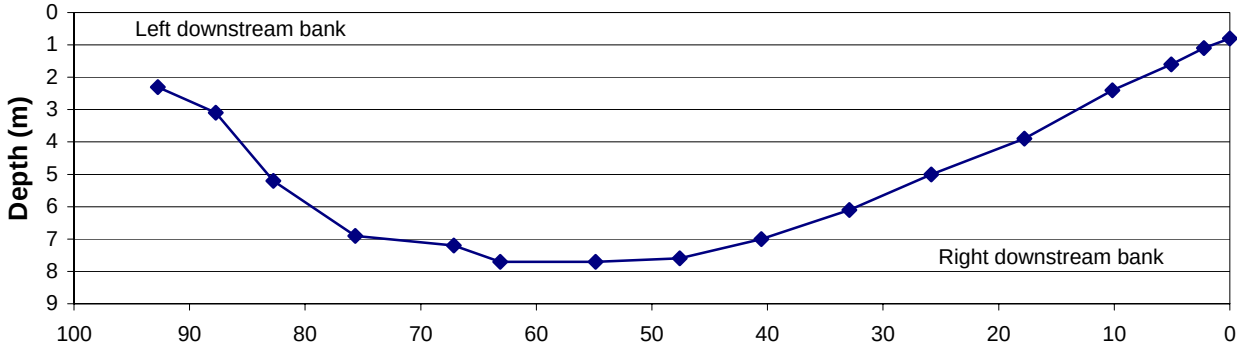


Figure E4 Continued.

T-6
(Cross-section transect conducted from
left downstream bank to right downstream bank)



T7
(Cross-section transect conducted from
right downstream bank to left downstream bank)



T8
(Cross-section transect conducted from
left downstream bank to right downstream bank)

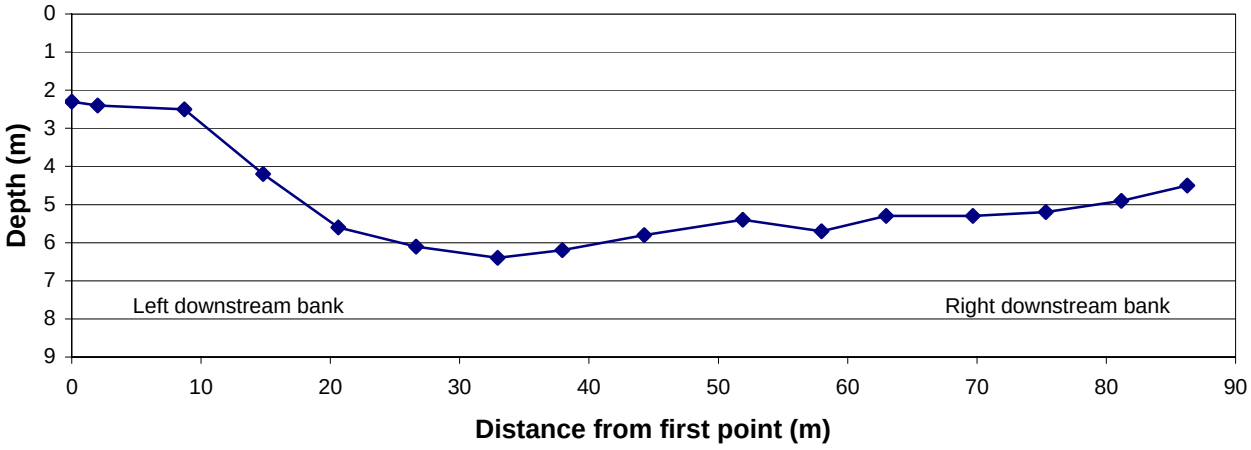


Figure E4 Continued.

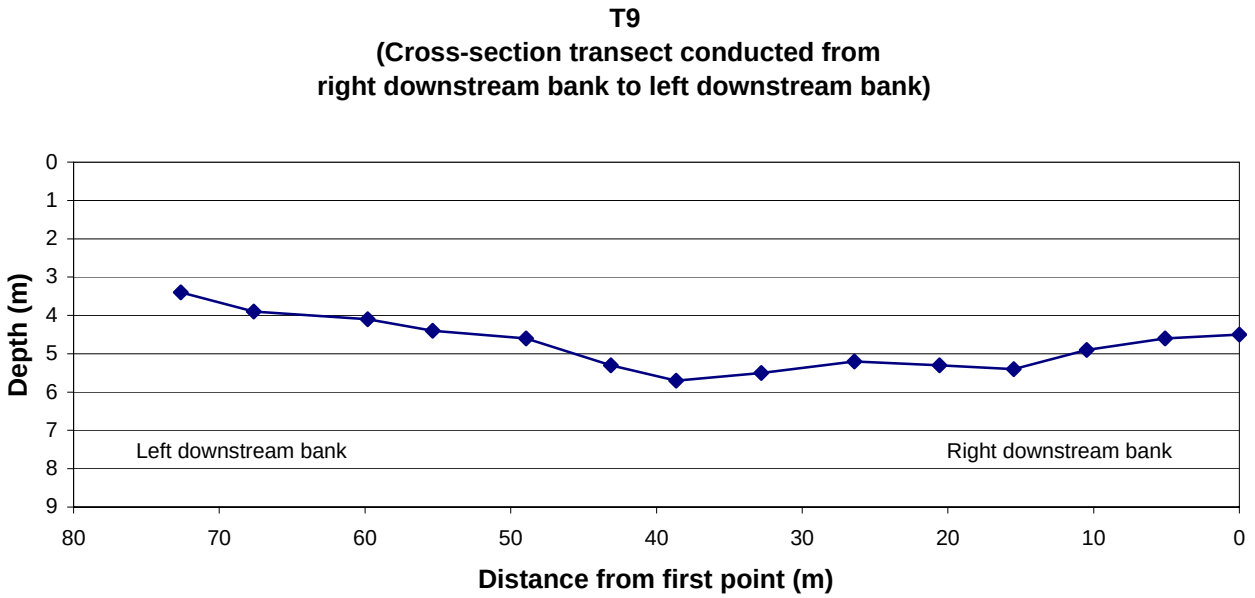


Figure E4 Continued.