NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM

REGION 7 (OMINECA-PEACE) 2001-2002 DATA REPORT

FINAL REPORT

Engineering Earth's Development, Preserving Earth's Integrity

Golder Associates

REPORT ON

NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM

REGION 7 (OMINECA-PEACE) 2001-2002 DATA REPORT

FINAL REPORT

Submitted to:

BC MINISTRY OF WATER, LAND & AIR PROTECTION
Omineca Sub-Region
Fish Wildlife & Habitat Protection
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Cover Photo: Rapids near suspected white sturgeon spawning event in the Nechako River upstream of Isle Pierre ferry crossing, June 2002.

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1.0 INTRODUCTION

1.1 BACKGROUND AND STUDY OBJECTIVES

An intensive sampling program for white sturgeon (*Acipenser transmontanus*) was conducted on the Nechako River over a five-year period, from 1995 to 1999 (RL&L 2000a). The program involved the development of a baseline database on white sturgeon life history, distribution, behaviour, habitat use, reproductive characteristics, population, and genetic status. The fish and habitat data collected was subsequently used to develop a population dynamics model (Korman and Walters 2001); this model predicted that there are approximately 150 mature females left in the population and that this number will decline to 25 by the year 2025. The recruitment failure appeared to be linked to marked changes in the natural discharge regime due to upstream dams and diversion of water.

Through the analysis of tissue samples, the Nechako River sturgeon were identified as being genetically distinct from the sturgeon population in the upper, middle and lower Fraser River mainstem (Pollard 2000). Due to the importance of preserving the genetic diversity and the recruitment issues in the Nechako River, a recovery planning process was initiated where short-term, medium-term and long-term initiatives were discussed and are being developed (Recovery Plan for Nechako River White Sturgeon – Draft Recovery Initiative 2002). These initiatives include flow management, collection of additional baseline genetic data, investigations of fish community interactions, and the development of a recovery facility.

An additional two-year field program was requested by the Ministry of Water, Land and Air Protection (BC MWLAP) to monitor movements of reproductively mature sturgeon to potential spawning areas in the Nechako River and to determine spawning success in relation to river discharge and water temperature (Golder 2001). The overall objective of the program was to provide information that could be used by the Nechako River White Sturgeon Recovery Initiative to determine if experimental flow management could be used to initiate successful spawning by Nechako River white sturgeon. The field program was organized into three phases:

- *Phase 1* – Capture of sturgeon in the later stages of reproductive maturity and surgical implantation of radio transmitters in these fish;

- *Phase 2* – Monitor, by radio telemetry, the movements of these fish during the spring/summer spawning period and assess their movements to potential spawning habitats in response to environmental cues (flow and temperature); and,

- *Phase 3* – Determine successful spawning activity by sampling for fertilized eggs or larvae in the areas identified by telemetry as potential spawning sites.

In spring 2002, after consultation with BC MWLAP, the scope of the program was modified as follows:

- Late May 2002 - Reduction of reporting requirements and increase in funding to enable an extension of the duration of the egg sampling;
- Early July – Field program modifications to include the re-capture of an adult female white sturgeon suspected of spawning in the Nechako River; and,
- Mid July – Increased telemetry efforts in the Nechako River and upper Fraser River.

These changes are described in further detail in Section 3.0.

1.2 STUDY AREA AND SAMPLE PERIODS

The study area encompassed the section of the Nechako River from Whitemud Rapids to upstream of Engen, the lower 5 km of the Stuart River, and the Fraser River downstream of Prince George to near Fort George Canyon (Figure 1.1). The primary adult fish sampling effort was distributed between Vanderhoof (rKm 139) and Isle Pierre Rapids (rKm 58).

Sampling in the Nechako River drainage occurred during the fall (2001), spring and summer (2002) (Table 1.1). Monitoring of radio-tagged white sturgeon movements by telemetry was initiated during fall 2001 and continued until late winter 2003.

Table 1.1 Summary of white sturgeon sampling programs and their periods, 2001 to 2002.

Study Session	Study Program	River System	Sample Methods	Sample Period [a]

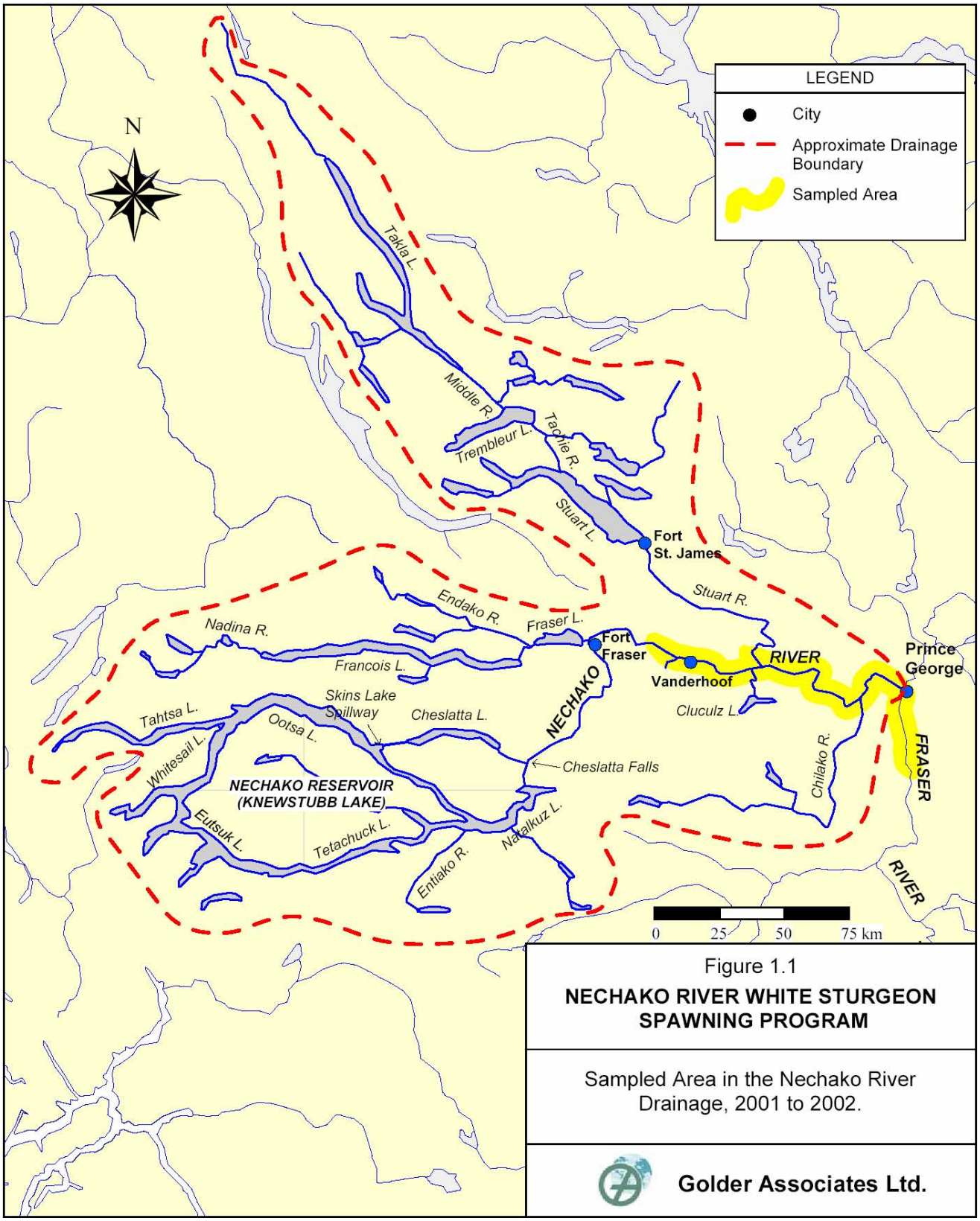

Figure 1.1

NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM

Sampled Area in the Nechako River Drainage, 2001 to 2002.

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2.0 METHODOLOGY

2.1 PHYSICAL PARAMETERS

2.1.1 Stream Discharge

Mean daily discharge data for the study area during 2001 to 2002 was obtained from the Water Survey of Canada, Data Management and Applications Department of Environment Canada (Unpublished Data, Appendix A, Table A1). Discharge data obtained included the Skins Lake Spillway, the Nechako River (below Cheslatta Falls, at Vanderhoof, and at Isle Pierre), the Nautley River (near Fort Fraser), the Stuart River (at Fort St. James), and the Fraser River (at Shelley).

2.1.2 Water Temperature

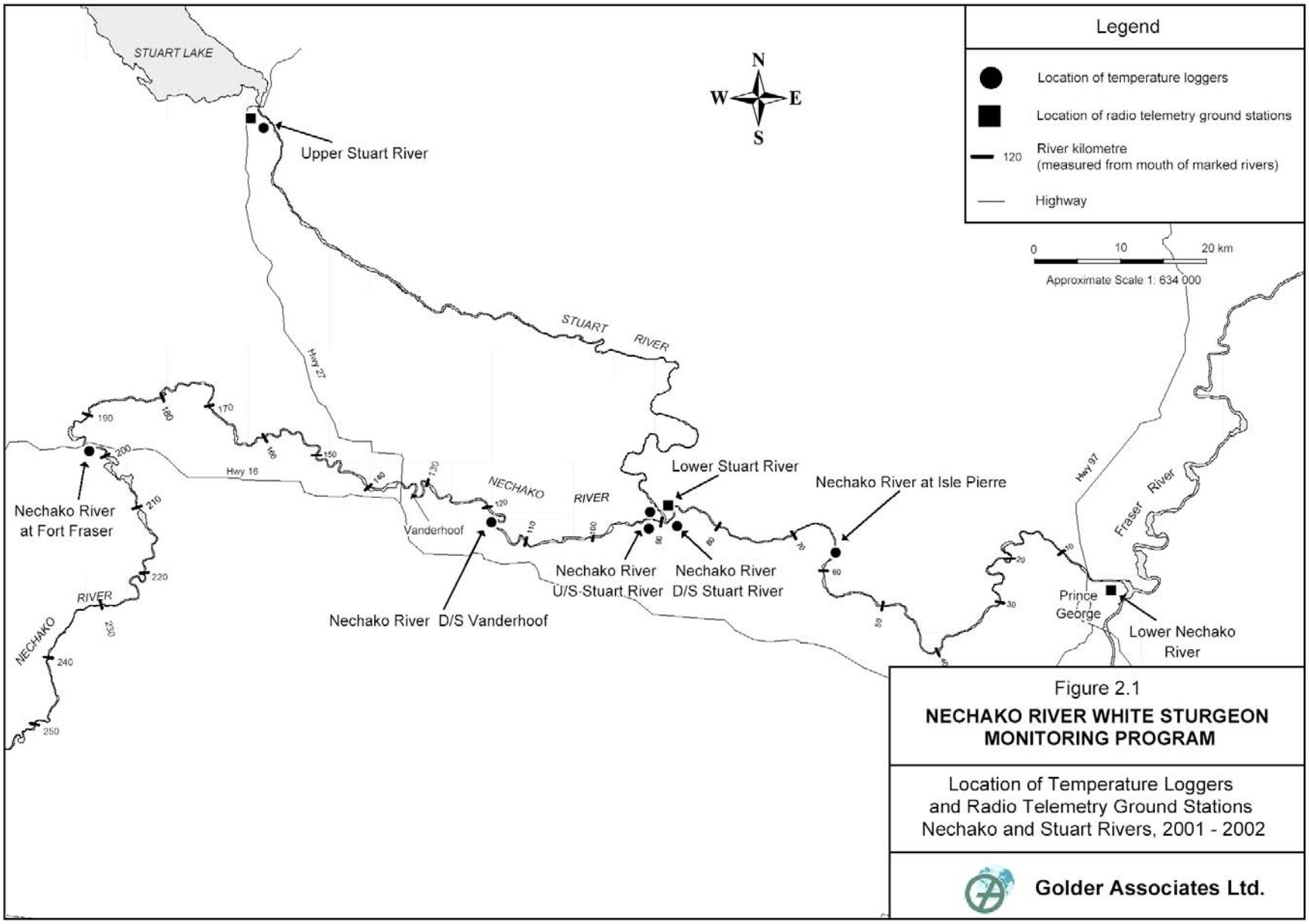
Optic Stowaway™ and Vemco™ temperature data loggers were deployed at seven sites in the Nechako and Stuart rivers to monitor water temperature for the duration of the field investigations (Figure 2.1; Appendix A, Table A1). Hourly water temperature data was collected from three locations during the fall sampling: upstream and downstream of the Nechako/Stuart river confluence and the Stuart River upstream of the confluence. Three additional locations were selected for the Nechako River during the spring and summer sessions and included upstream of the Nautley River, upstream of the Sinkut River, and the ferry landing above Isle Pierre; one logger was deployed in the Stuart River downstream of Fort St. James.

Mean water temperature data was also acquired from the Department of Fisheries and Oceans for the Nechako, Nautley, Stuart and Fraser rivers (Appendix A, Table A1). Additional mean water temperature data for the Nechako River upstream of the Stuart River confluence (Finmoore area) were obtained from Triton Environmental Consultants Ltd. (Triton 2003). These data encompassed the July to August 2001 period and were collected as part of the summer water temperature and flow management project for the Nechako Fisheries Conservation Program (NFCP). All data obtained from these sources corresponded with the salmon spawning periods.

Water temperature was also collected daily during the program with a calibrated hand-held thermometer.

2.1.3 Habitat Selection

General habitat descriptions were recorded for sampled locations in 2001 and 2002. These measurements included water temperature, water clarity, nearshore and offshore depths, and a general description of flow patterns and site features. Additional effort went


Legend
Location of temperature loggers
Location of radio telemetry ground stations
120 River kilometre (measured from mouth of marked rivers)
Highway
0 10 20 km
Approximate Scale 1: 634 000
N
W E
S
STUART LAKE
Upper Stuart River
STUART RIVER
Hwy 27
Hwy 16
Hwy 97
NECHAKO RIVER
Fraser River
Lower Stuart River
Nechako River at Isle Pierre
Nechako River at Fort Fraser
Vanderhoof
Nechako River U/S Stuart River
Nechako River D/S Stuart River
Nechako River D/S Vanderhoof
Prince George
Lower Nechako River
Figure 2.1
NECHAKO RIVER WHITE STURGEON MONITORING PROGRAM
Location of Temperature Loggers and Radio Telemetry Ground Stations Nechako and Stuart Rivers, 2001 - 2002
Golder Associates Ltd.

into defining habitat characteristics (e.g., surface velocity) in areas where egg collection mats, drift nets, and Miller samplers were deployed.

2.2 ADULT FISH CAPTURE

2.2.1 Capture Techniques

Set lines, angling, and tangle nets were employed during the program to capture adult white sturgeon for radio transmitter implantation. These techniques were similar to those used in previous white sturgeon studies in the Nechako River drainage as described by RL&L Environmental Services Ltd. (RL&L 2000b, 1999, 1998, and 1997). Sockeye spawning mortalities obtained from the Stellako River fish counting fence (collected under Fisheries and Oceans Canada [DFO] license 01.553) were used as bait during the study. Habitat and capture data (including incidental catches) were recorded, and catch-per-unit-effort (*CPUE*) summaries were generated.

Tangle net sampling was also conducted during the fall (2001) and summer (2002) in the study area. The typical net configuration consisted of a single panel net (area of 46.5 m^2), although two panel sets were also used, with each panel being of a different mesh size. The mesh sizes of tangle nets deployed varied between 127.0 mm (5.0") and 228.6 mm (9.0"). The use of these large mesh sizes during the fall allowed the passage of salmonids and other fish species, to reduce migrating sockeye salmon by-catch. Tangle nets were only used opportunistically during the fall after the majority of the salmon migrations were completed, and were also used during the early summer to target a female white sturgeon suspected of spawning. All nets were closely monitored and set times did not exceed one and a half hours between checks. *CPUE* data (number of fish/net day by mesh size) was calculated for each net set and all incidental catches were noted.

2.2.2 Handling and Processing

The handling and processing of white sturgeon followed techniques similar to those described by RL&L (1997); deviations from those techniques are described below. An emphasis on reduced handling time and the maintenance of normal fish respiration served to minimize processing stress on captured fish. Prior to release, each fish was carefully monitored to confirm normal behaviour and full recovery. All white sturgeon captured and sampled for life history information were released in apparent good health and displayed normal respiration and swimming behaviour.

2.2.2.1 Life History Data Collection

Standard methods were used for the collection of life history data (RL&L 1996). All captured white sturgeon were measured for fork length (FL), total length (TL), girth (measured behind the pectoral fins), pre-opercular length (tip of snout to posterior margin of operculum), and post-orbital length (tip of snout to posterior margin of orbit). All measurements were taken to the nearest 0.5 cm. Weight was measured using a 135 kg (±2%) capacity spring scale.

Sturgeon captured during the program were scanned for passive integrated transponder tags (PIT tag) using an AVID Power Tracker II Reader, to identify recaptured fish. Those fish not previously captured were injected with a PIT tag subcutaneously at the base of the skull on the dorsal side of the fish and the digital code was recorded. All sturgeon captured were also marked with a numbered T-anchor tag (supplied by Floy Tag and Manufacturing Inc). T-anchor tags were used to facilitate external identification of recaptured individuals.

For ageing purposes, and as a secondary mark for identification, a section from the leading left pectoral fin ray was removed and have been archived for future analysis. A sample of soft tissue was also collected for genetic DNA analysis from newly encountered (i.e., not recaptured) white sturgeon, by removing a small section (1 cm^2) of the distal end of the pectoral fin and preserving the sample in 99% denatured ethanol. The DNA samples were archived for later genetic analysis.

2.2.2.2 Sex and Maturity

Sex and maturity of white sturgeon were determined by surgical examination using procedures developed for white sturgeon in the U.S.A. and described by RL&L (1996) and Beamesderfer et al. (1989). Subjective assessments were used when the maturity stages were intermediate relative to the classification system. Surgery was only performed on fish likely to be reproductively mature based on external characteristics (i.e., >150 cm fork length and/or turgid belly).

2.2.2.3 Radio Transmitter Implantation

Based on the surgical examination, white sturgeon that would potentially spawn in the spring of either 2002 or 2003 were implanted with a radio transmitter. These transmitters were surgically implanted (as opposed to external attachment during the previous Nechako River studies) following the protocols described by Schrek and Moyle (1990), with the antennae exiting the body wall of the fish.

Two types of transmitters were available for implantation. The MCFT-3A microprocessor coded radio transmitter measured 16 x 51 mm and weighed 6.2 g in water. This tag was similar in design to those used in the previous radio telemetry work conducted by RL&L (1999) in the Nechako River. The second tag used for the project was the CART 16-2s, a microprocessor coded acoustic/radio transmitter. This tag measured 16 x 68 mm and weighed 18.0 g in water. The CART series tag design combines both radio and acoustic frequencies on a single transmitter (which eliminated the need to double-tag fish), and systematically switches between radio and acoustic frequencies as appropriate. With the use of this technology, a white sturgeon could be tracked in a shallower riverine environment, as well as at depth in a lake (e.g., Stuart Lake, Fraser Lake) where a conventional radio transmitter is limited. Both the MCFT and CART tag designs are high frequency tags manufactured by Lotek™ and use the same SRX-400 receiver for tracking.

2.3 Adult Fish Movements

Information on the movements of radio tagged fish was collected using aircraft, riverboat, shore, and fixed remote ground stations (data loggers). Twenty aerial flights were conducted either with fixed wing (Cessna 182) or helicopter (Hughes 300) between September 2001 and March 2003. Flights were initiated from Prince George, and were generally conducted monthly over the winter period and more frequently (weekly) during the spring spawning period. These flights were often flown co-operatively with the Saik'uz First Nation, BC MWLAP, and Golder, to maximize the amount of information collected for each group.

Sturgeon were also tracked periodically by ground during the winter, approximately once per month, at identified overwintering locations. During the spring and summer 2002, tracking by boat was conducted daily, with more intensive monitoring of fish suspected of staging.

All tracking was conducted using a Lotek™ SRX-400 receiver and a three-element directional Yagi antennae. Radio signal information (i.e., frequency, channel, code, and signal strength) and location information (i.e., river kilometre, UTM coordinates, and area description) were recorded for each sturgeon that was detected.

Remote ground stations were installed to continuously monitor for movements of radio-implanted sturgeon past fixed points. These were set up in three different locations (Table 2.1) to detect immigration and emigration into and out of Stuart Lake, and between the Stuart, Nechako, and Fraser rivers. The configuration was generally the same for each station, consisting of a Lotek™ SRX-400 receiver with datalogger capabilities, four-element directional antenna, 12 v power supply and solar panel recharging system.

Table 2.1 Summary of radio telemetry ground station locations and periods of operation, 2001 to 2002.

Ground Station Location [a]	2001	2002

The ground station at the Nechako/Stuart confluence had two antennae and a switcher module installed to identify both upstream and downstream movements between the two systems. The loggers at these stations recorded date, time and radio signal information.

2.4 Spawning – Egg and Larval Collection

In an attempt to capture egg or larval stages of white sturgeon and confirm spawning activity in the Nechako River, egg collection mat and D-ring drift net sampling was conducted in the spring and early summer 2002. Egg collection mat and D-ring drift net effort was expended in three locations: the Hulatt Rapids, the Stuart River confluence, and the Isle Pierre Rapids area. The configuration and method of deployment of these gear is described in RL&L (1999, 1998). The mats were checked and cleaned at three-day intervals. The D-ring drift nets were used opportunistically.

In addition to the D-ring drift nets and egg collection mats, Miller high speed plankton samplers were used to collect eggs and larva. The sampler consisted of a 61 cm tubular fiberglass body, with a 90 cm long nylon net tapering into a 23 cm long collection bucket. The mesh size of both the net and collection bucket was 760 µ. The samplers were deployed in fast water areas downstream of a suspected spawning area from an anchored boat. Due to the low surface drag of the samplers, multiple units could be deployed at different depths in the water column (surface, 0.5 m, and 1.0 m).

3.0 RESULTS

3.1 Physical Parameters

3.1.1 Discharge

The mean daily discharge for the Nechako, Nautley, Stuart, and Fraser rivers are summarized in Appendix A. These hydrographs depict the annual trends in discharge for the 2001 to 2002 period.

The hydrograph of the Nechako River below Cheslatta is very similar to the flows released from Skins Lake Spillway (Appendix A, Figure A1). Maximum discharge values below Cheslatta Falls were 263.0 m^3/s in 2001 and 273.0 m^3/s in 2002. The discharge for the Nechako River at Vanderhoof reflects the late summer cooling water release from Skins Lake Spillway, but earlier peaks during spring freshet are as a result of the influence of the Nautley River, emptying from Fraser Lake (Figure A2). The peak discharge values in 2001 and 2002 were 298.0 m^3/s and 357.0 m^3/s, respectively, both recorded during mid-August cooling releases.

The Nechako River discharge downstream of the Stuart River confluence is also moderated by the influence of the Stuart River, which originates from Stuart Lake (Appendix A, Figure A3). In both 2001 and 2002, the flows for the Nechako River at Isle Pierre began to rise in mid-May, peaking in late July (2001) and early June (2002). In 2002, the discharge at Isle Pierre remained high throughout the June and July period due to local precipitation. The flows remained high through August in both years due to the influence of releases from Skins Lake Spillway. A rapid reduction in flows was documented during late-August in both years at this location.

The discharge for the Nechako River near Isle Pierre during the egg/larval sampling program in the early June to mid-July period 2002, was relatively constant and ranged between 647 and 708 m^3/s; the average daily flow for the period was 686 m^3/s.

The Nautley River near Fort Fraser and the Stuart River near Fort St. James (Appendix A, Figures A4 and A5) illustrate hydrographs that are naturally regulated by the source lakes (Fraser and Stuart lakes, respectively); however, the Fraser River near Shelly illustrate a hydrograph typical of a non-regulated system (Figures A6). In the Nautley River, the flows began to increase in early May peaked during the early June period in both 2001 and 2002 (55.2 m^3/s, 13 June 01 and 186.0 m^3/s, 2 June 02). Flows in the Stuart River began to rise in early May in 2001, but were delayed until early June in 2002; the maximum discharge in both years occurred in early to mid-July (318.0 m^3/s, 15 July 01 and 510.0 m^3/s, 1 July 02). Flows in the Fraser River fluctuated in both 2001

and 2002, but generally began to increase during early May and early June (2001 and 2002, respectively) and declined by mid-August. Peak flows for the Fraser River occurred on 21 July 2001 (3280.0 m^3/s) and 19 June 2002 (4260 m^3/s). In general, the flows in all three river systems exhibited sharper increases in discharge and higher peak values in 2002 than in 2001, due to higher snowpack conditions in the headwater regions and local precipitation events.

3.1.2 Water Temperature

Water temperatures in the Nechako River were recorded upstream and downstream of the Stuart River confluence during the 2001 to 2002 program (Appendix A, Figures A2 and A3). The maximum mean daily water temperatures recorded upstream of the Stuart River confluence were 19.6°C on 15-17 August 2001 (Triton 2003) and 19.9°C on 27 July 2002 (Appendix A, Figures A2). A similar maximum mean daily water temperature of 19.5°C on 27 July 2002 was recorded for the Nechako River near Isle Pierre (Appendix A, Figures A3). The water temperature for the Nechako River near Isle Pierre during the egg/larval sampling program in 2002 was variable and ranged between 13.2°C and 17.3°C; the average daily water temperature for the early June to mid-July period was 15.6°C.

Stuart River water temperature data collected near the outlet of Stuart Lake (DFO unpublished data) and near the Nechako River confluence (Golder data logger) were similar (Appendix A, Figure A5). The mean daily water temperature graphs for the Stuart River recorded in 2001 and 2002 were similar, with peak values of 20.4°C measured on 16 August 2001 and 19.1°C measured on 25 July 2002.

The water temperatures recorded from the Fraser River near Shelley during the summer periods in 2001 and 2002 were variable, corresponding to the fluctuating flow regime (Appendix A, Figure A6). The water temperatures appeared slightly lower in 2001 than in 2002, likely due to the lower discharge recorded in during 2001. A maximum water temperature value of 16.6°C was recorded on 16 August 2001 and a maximum recorded temperature of 13.9°C was recorded on 13 August 2002; however, difficulties with the data logger in 2002 yielded an incomplete dataset, and the temperatures may have been higher (D. Barnes DFO, pers. Comm.).

3.2 Habitat Use

The general habitat features of the Nechako River and its tributaries have been defined in several reports (Slaney et al. 1986; RL&L 2000b, 1998, 1997, 1996). In 2001 to 2002, adult white sturgeon were encountered in similar habitats that included low velocity laminar flow areas and nearshore depositional areas. Depths of set line sample locations

ranged from 1.5 to 12.7 m in 2001, similar to those measured in previous years (RL&L 2000b, 1999, 1998, 1997).

Habitat data were collected during the spring from egg and larval sample locations at or near potential spawning locations in the Nechako River (Hulatt Rapids, Stuart confluence, and Isle Pierre Rapids) and the lower Stuart River. Surface water velocities at egg collection mat sample locations ranged from 0.12 to 2.78 m/s and depths ranged from 0.8 to 4.3 m. Water depths and surface velocities at drift net sample sites reached a maximum of 5.8 m and 2.55 m/s, respectively. Similar maximum depth (4.6 m) and water velocity (2.30 m/s) conditions were measured at Miller sampler sites.

A pre-spawning female white sturgeon (*Female 20-4*) appeared to stage in a deep pool located at rKm 66.3. The pool was approximately 7 m deep, with a slight backwater influence near the surface and fine substrates (i.e., sand and silt) on the near shore. On the opposite shore, large bedrock outcrops created backwater areas with defined eddy lines. The backwater approached depths of 13 m along the eddy line near the thalweg.

The instream habitat approximately 500 m downstream of the suspected staging area consisted of a deep rapids section within a constricted channel (see cover photo). The dominant substrate in the section was bedrock and boulder material, although small areas of fines were located in the slow water along the periphery. The surface velocities measured at egg/larval mat sample sites (potential spawning habitat for *Female 20-4* within the rapids section) ranged between 0.12 and 2.58 m/s; the depths ranged between 1.1 and 3.5 m.

3.3 Adult Fish Collection

3.3.1 Collection Areas

Previous white sturgeon studies conducted by RL&L in the Nechako River drainage identified several high use areas. These areas were targeted during fall 2001 to minimize the travel time and maximize the capture effort. The areas of effort included downstream of Vanderhoof (rKm 122 to 127), the Sinkut River area (rKm 115 to 117), and the section between Isle Pierre and the Stuart River confluence (rKm 67 to 79) (Figure 3.1). Adult capture effort during the summer 2002 was restricted to the Stuart River confluence area (Figure 3.2) and the Fraser River upstream of Fort George Canyon (Figure 3.3).

3.3.2 Captures

Sixty-four white sturgeon were captured during the 2001 to 2002 study program. The majority of the fish (95%) were sampled by set line (Appendix B, Table B1); the remainder were captured by angling (Appendix B, Table B2).

A total of 36 627 hook-hours of set line sampling effort were expended in the Nechako River during fall 2001 to obtain mature white sturgeon for radio tag implantation (Figure 3.1, Table 3.1). An additional 2806 and 1540 hook-hours of effort were expended during the summer 2002 in the Nechako (Figure 3.2) and Fraser rivers (Figure 3.3), respectively, in an attempt to recapture a marked female white sturgeon suspected of spawning. Most of the fish captured by set line were adult sized (Appendix C, Table C1), except for one smaller sturgeon that measured 92.0 cm FL captured near Neuco Creek (rKm 125.1).

Table 3.1 Summary of catch, catch rate (*CPUE*=No. fish/100 hook-hours), and size range (fork length) for white sturgeon captured by set line in the Nechako and Fraser rivers, 2001 to 2002.

Survey Session	Waterbody	Date	Sample Effort (hook-hours)	Catch	*CPUE*	Size Range (cm)

Angling effort was expended opportunistically for a total of 56.9 hook-hours. Most of the effort was applied during the fall 2001 period (55.0 hook-hours) at identified overwintering locations in the Nechako River, resulting in the capture of three white sturgeon (Appendix B, Table B2). These fish ranged in size from 110.0 to 185.0 cm fork length. Angling effort in the summer 2002 was concentrated near the Stuart River confluence in the Nechako River (0.5 hook-hours) and in the Fraser River mainstem upstream of Fort George Canyon (1.4 hook-hours); no fish were captured.

Due to potential salmon bycatch, tangle nets were used with limited effort during the fall 2001 and summer 2002 sessions (Appendix B, Table B3). A total effort of 0.32 net-days was expended, primarily in the summer to target a female white sturgeon suspected of spawning; no fish were captured.

A total of thirteen northern pikeminnow were captured by set line (n=7) and angling (n=6) during the field study; all fish were released alive.

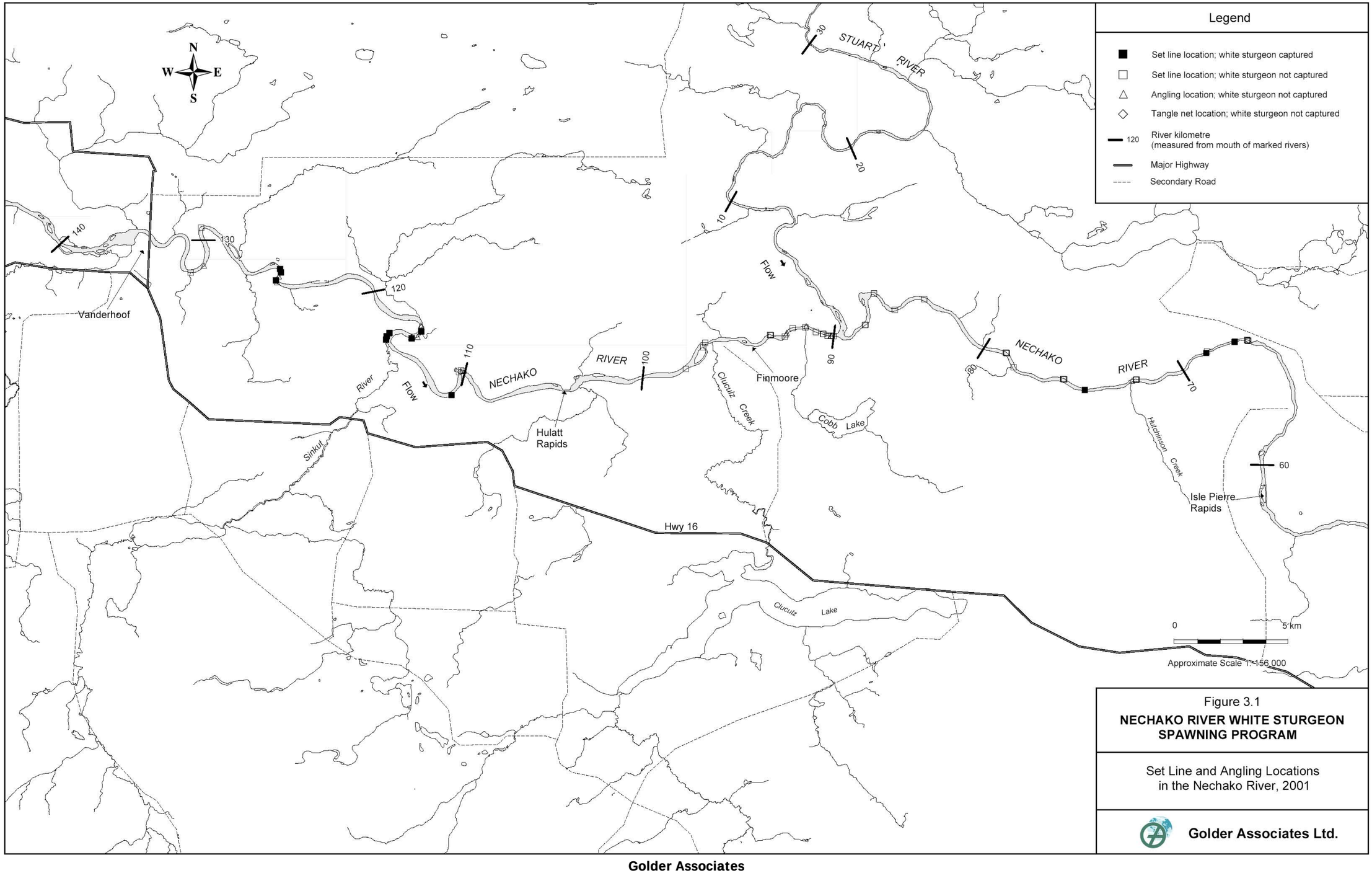
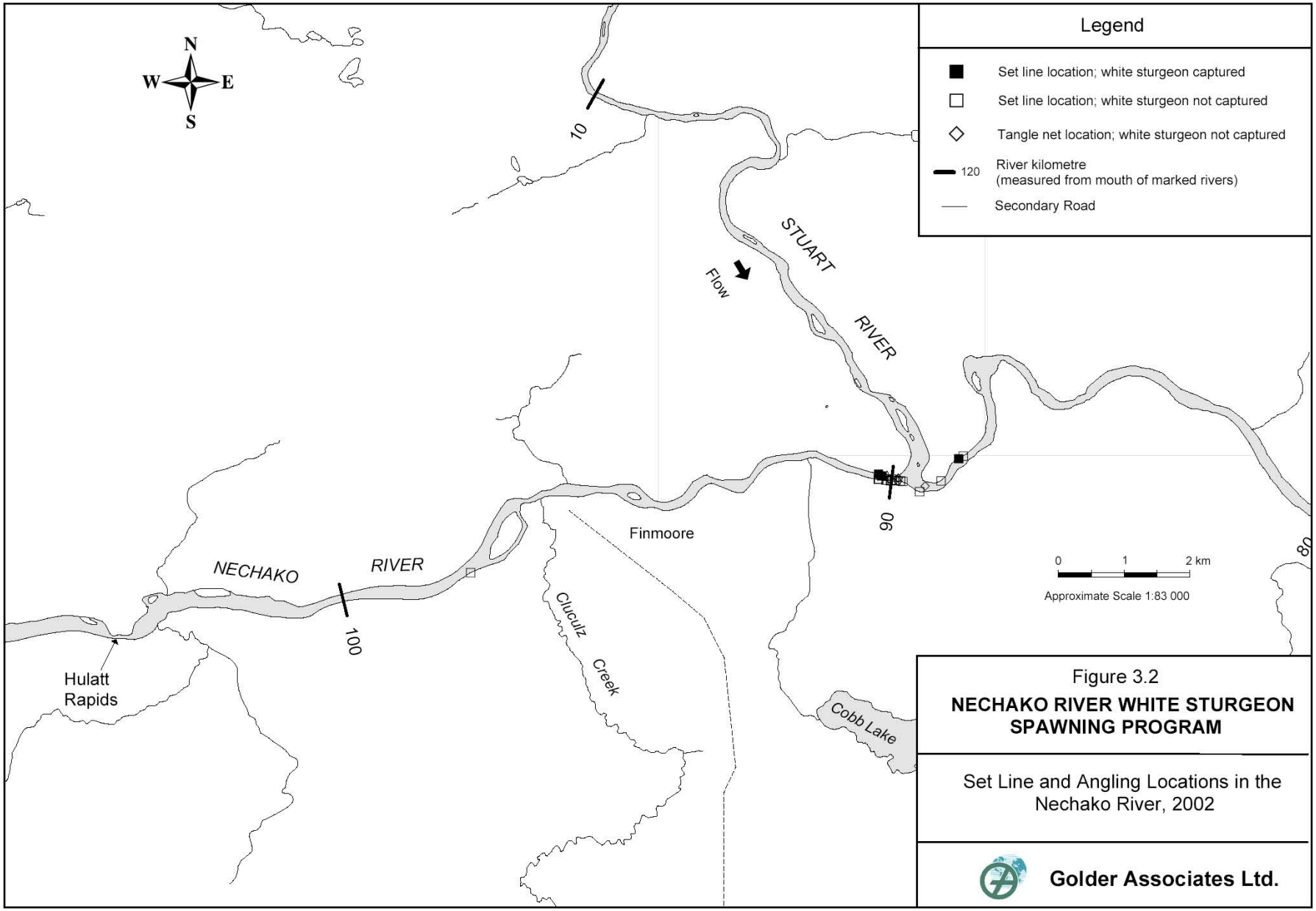
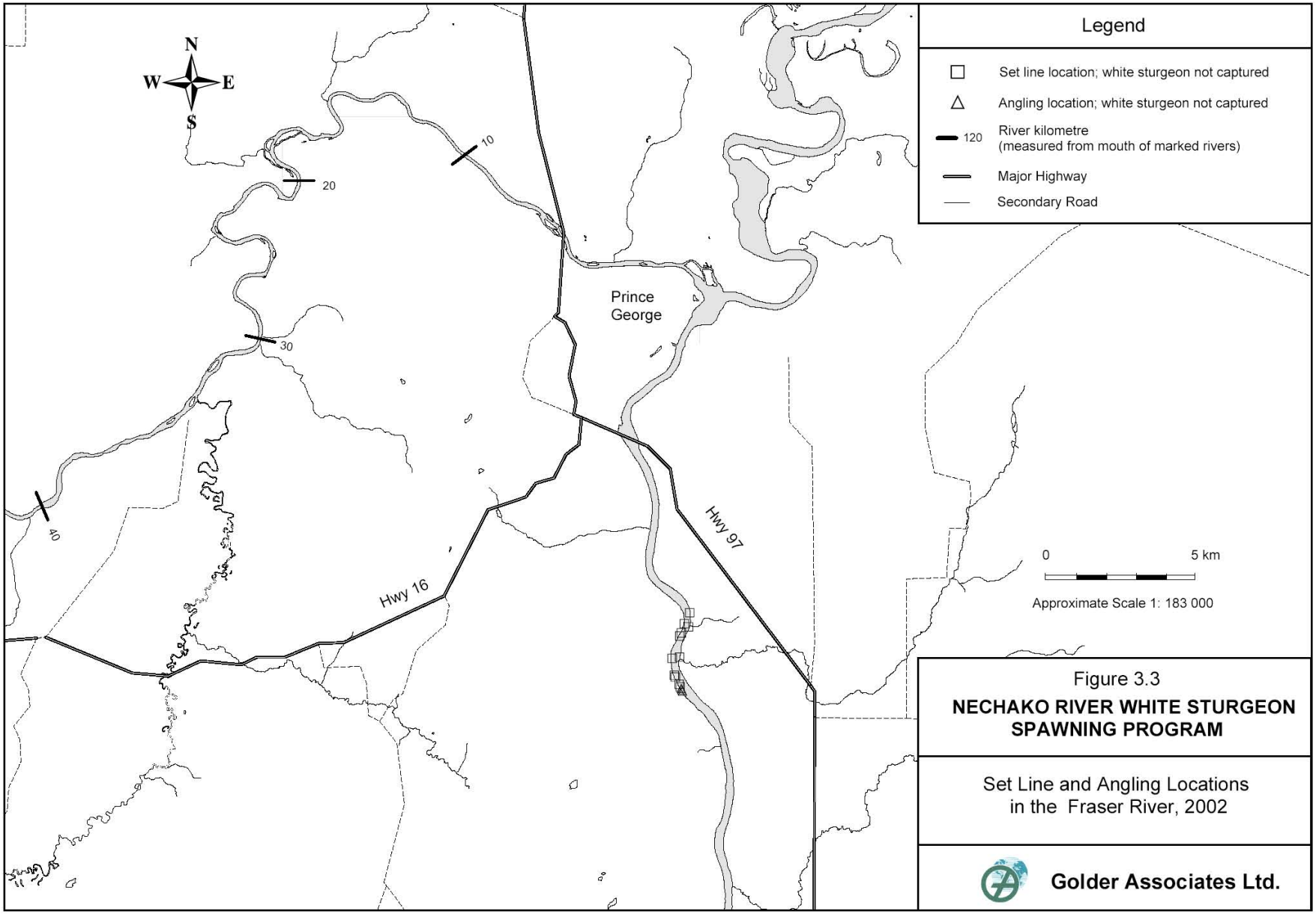


Figure 3.1
NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM

Set Line and Angling Locations in the Nechako River, 2001

Golder Associates Ltd.


N
W
E
S
Legend
Set line location; white sturgeon captured
Set line location; white sturgeon not captured
Tangle net location; white sturgeon not captured
120 River kilometre (measured from mouth of marked rivers)
Secondary Road
STUART RIVER
Flow
NECHAKO RIVER
Finmoore
Cluculz Creek
Cobb Lake
Hulatt Rapids
110
100
90
80
0 1 2 km
Approximate Scale 1:83 000
Figure 3.2
NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM
Set Line and Angling Locations in the Nechako River, 2002
Golder Associates Ltd.


N
W
E
S
10
20
30
40
Prince George
Hwy 16
Hwy 97
Legend
Set line location; white sturgeon not captured
Angling location; white sturgeon not captured
120 River kilometre (measured from mouth of marked rivers)
Major Highway
Secondary Road
0
5 km
Approximate Scale 1: 183 000
Figure 3.3
NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM
Set Line and Angling Locations in the Fraser River, 2002
Golder Associates Ltd.

3.3.3 Sex and Maturity

Thirty white sturgeon (46.9% of those captured) were surgically examined to determine sex and stage of maturity and thereby identify suitable candidates for radio transmitter implantation (Appendix C, Table C2). The fish were classified according to the sexual maturity codes presented in Appendix E, Table E1; fork length (cm FL) and weight (kg) data for each of the sexual maturity stages are summarized in Table C3.

The surgically examined fish ranged from 141.0 to 234.0 cm FL and weighed from 21.8 to 104.8 kg. Of these fish, 20 were identified as males, eight as females, and two as unknown (due to either early stage of development and/or excessive fluid in the abdominal cavity). Most sturgeon assessed (n=17) were in the early stages of reproductive development.

Eleven of the male white sturgeon were considered mature (Stage 04) and all received radio transmitters. Of the fish identified as female, three were classified as pre-vitellogenic (Stage 12); these fish measured an average of 166.5±5.3 cm FL and weighed an average of 35.1±3.7 kg (Appendix C, Table C3). Two females were identified as early-vitellogenic (Stage 13); one received a radio tag to monitor for potential spawning movements in 2003. Three sturgeon were classified as late reproductive (Stage 14); two of these fish were captured during the fall 2001 and one during the summer 2002. These fish measured an average of 185.3±15.4 cm FL and had an average weight of 52.3±14.9 kg. All of the Stage 14 female sturgeon were surgically implanted with a radio transmitter to monitor potential spawning behaviour.

3.4 Adult Fish Movements

3.4.1 Radio Telemetry Data

The primary objective of the 2001 to 2002 program was to capture adult white sturgeon and implant radio transmitters in mature male and female fish likely to spawn in 2002, to allow the monitoring of their pre-spawning behaviour and movements to spawning areas. The life history data and sexual maturity stage for each fish that received a transmitter are presented in Appendix C, Table C2. Although white sturgeon were radio-tagged in the Nechako River system in previous studies (RL&L 2000b, 1999, 1998, 1997, 1996) and some of the tags may still be active, the following descriptions of movements are restricted to fish tagged during the present program. For each discussion, each fish has been individually identified by sex and the transmitter channel-code identification (e.g., *Male 20-1* is a male sturgeon implanted with a radio transmitter uniquely identified on Channel 20, Code 1). Tabular data for each radio transmitter is presented in Appendix D, Table D1.

3.4.1.1 Monitoring of Male Sturgeon

Eleven reproductively mature male white sturgeon were implanted with radio transmitters during the 2001 to 2002 program. Most (*n*=8) of the males were captured near the Sinkut River (rKms 115 to 117); two were captured near rKm 125 and one was captured near rKm 67.

MALE 20-1

This late reproductive male was captured at rKm 67.0 on 15 September 2001 (Figure 3.4). The fish measured 203.0 cm FL and weighed 68.2 kg. During fall and winter, the fish remained within a localized area downstream of the Stuart River near Hutchinson Creek, but did move to the Nechako/Stuart confluence for a short period at the beginning of July 2002. Its movements did not appear to be spawning related; however, two other male sturgeon and one female sturgeon were monitored near the confluence area during this time. This sturgeon was last located in October 2002 at rKm 67.5 at a suspected overwintering location.

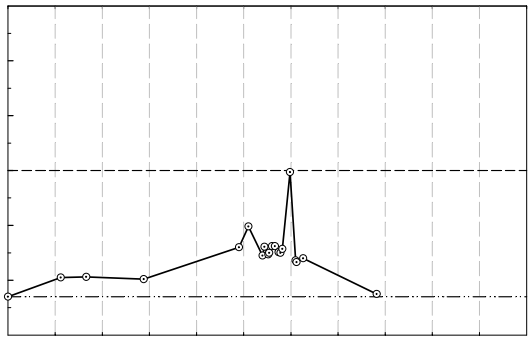


Figure 3.4 Summary of movements in 2001 to 2002 for white sturgeon *Male 20-1* in the Nechako River study area.

MALE 20-2

This late reproductive male measured 188.0 cm FL and weighed 55.3 kg. It was captured at rKm 116.8 on 1 October 2001 (Figure 3.5) and remained at the overwintering location until late April 2002. The fish then moved upstream past Vanderhoof to rKm 140.5 (downstream of the Highway 27 bridge) on 8 June. However, by 12 June, this fish had moved downstream approximately 60 km, to an area between the Stuart River and Hutchinson Creek. These movements may have been initiated by cues from the increasing water temperature and declining discharge in the upper Nechako River

(Figure 3.6; Appendix D, Figure D1). However, there were no rapids or sections of fast water considered to be typical suitable spawning habitat near the destination of the fish and it was uncertain whether these movements were spawning related.

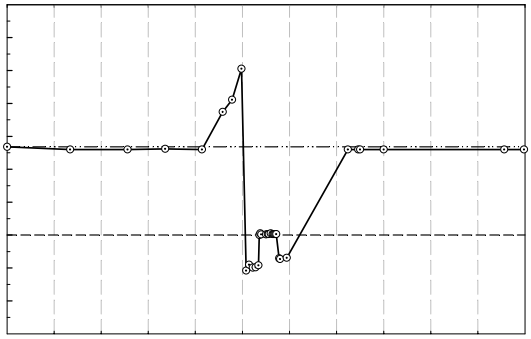


Figure 3.5 Summary of movements in 2001 to 2003 for white sturgeon *Male 20-2* in the Nechako River study area.

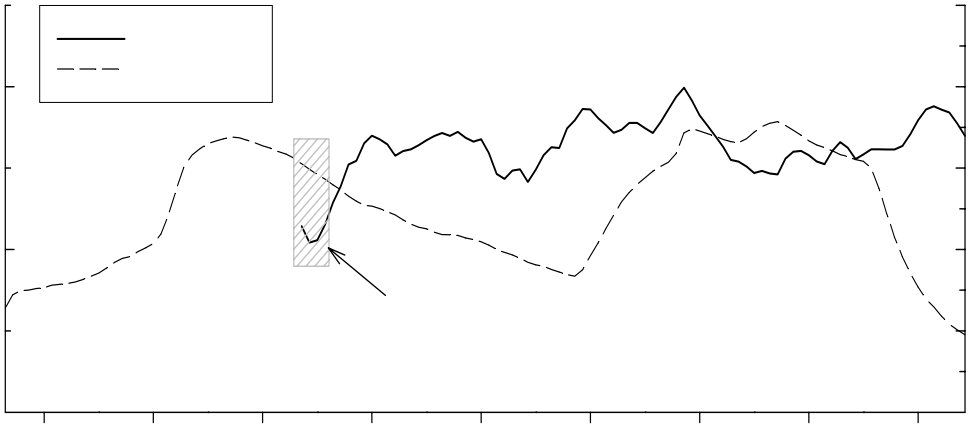


Figure 3.6 Water temperature and discharge in the Nechako River near Vanderhoof, with the potential spawning movement window in 2002 for white sturgeon *Male 20-2*.

The fish subsequently moved up to the Stuart River confluence in early July and remained in the area for approximately 1.5 weeks before returning downstream. Field observations of salmon migrating past the bridge at Fort St. James on 24 July 2002

(Byron Nutton, Habitat Management Biologist, Fisheries and Oceans Canada, pers. Comm.) suggest these upstream and downstream movements may have been feeding related and in response to the salmon migrations. On 28 September, this fish was located further upstream at the overwintering hole at rKm 116 and remained at this location as of the last tracking event on 18 March 2003.

MALE 20-3

A large white sturgeon (228.0 cm FL and 104.8 kg) captured on 23 September 2001 at rKm 114.9 was determined to be a late reproductive male. This fish remained near the Sinkut River until mid-May (Figure 3.7), after which it was located upstream near Leduc Creek (rKm 127). The sturgeon continued an upstream movement to rKm 135 (near Vanderhoof) on 5 June. The male then completed a downstream movement to the Stuart River confluence by 3 July, where it was last located on 5 July 2002. Although not logged by the upper Stuart River ground station, this sturgeon may have moved undetected through the Stuart River and into Stuart Lake.

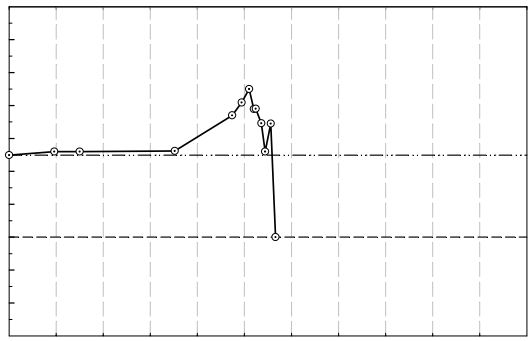


Figure 3.7 Summary of movements in 2001 to 2002 for white sturgeon *Male 20-3* in the Nechako River study area.

MALE 20-6

This fish was suspected to be an early reproductive male, but could not be confirmed due to excessive fluid present in the body cavity during the surgical examination. The fish was captured at rKm 124.7 on 13 October 2001 (Figure 3.8), measured 147.5 cm FL and weighed 24 kg. Although this fish was not ready to spawn in 2002, the decision was made to implant a transmitter as this fish was originally tagged on 17 July 2000 by the

Lheidli T'enneh at rKm 0.5 of the Nechako River during their sturgeon capture program in the Fraser River.

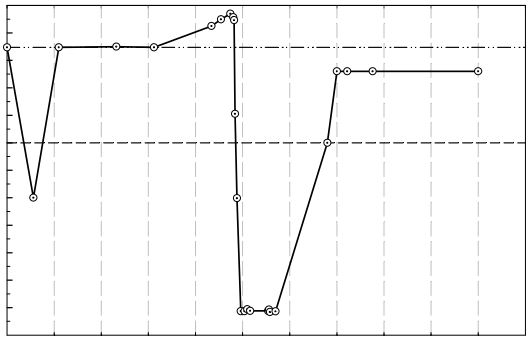


Figure 3.8 Summary of movements in 2001 to 2003 for white sturgeon *Male 20-6* in the Nechako River study area.

Some initial movement was noted during the late fall 2001 period downstream of the Stuart River near Hutchinson Creek before the fish returned to overwinter at the capture location. During approximately a one-month period between late May and early June 2002, this fish moved upstream to the vicinity of Vanderhoof. Between 11 and 18 June, this sturgeon exhibited a rapid downstream movement from the Vanderhoof area to below Whitemud Rapids near the Miworth area (rKm 29). The fish remained in this area until early fall. The initial upstream movement may have been in response to movements of other (possibly mature) fish leaving the overwintering area. By 28 September, this fish had returned upstream approximately 87 km, into the overwintering hole near the Sinkut River.

MALE 20-8

A late reproductive male white sturgeon was captured on 23 September 2001 at rKm 114.9 (Figure 3.9). The fish measured 183.5 cm FL and weighed 51.3 kg and remained near the Sinkut River overwintering location until late April 2002. The fish then made an upstream movement past Vanderhoof and was located at rKm 140.5 on 7 June, together with *Male 20-2*. Similar to *Male 20-2*, this fish also made a rapid movement downstream of the Stuart River to rKm 78.4 during approximately the same time period (Figure 3.6). This fish remained within the vicinity of rKms 74.8 and 80.6 until early July when it quickly migrated into the Stuart River and upstream into Stuart Lake, a distance of approximately 162 km. It was last located in the lake on 17 July 2002.

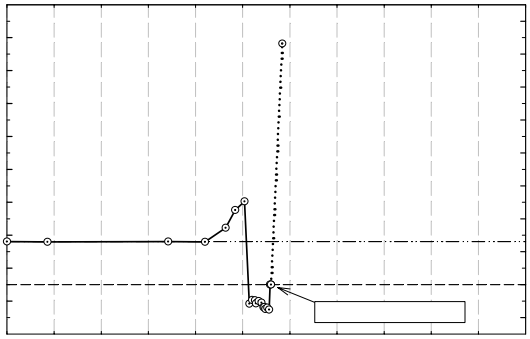


Figure 3.9 Summary of movements in 2001 to 2002 for white sturgeon *Male 20-8* in the Nechako River study area.

MALE 20-9

This late reproductive male (199.0 cm FL, 60.3 kg) was captured on 25 September 2001 at rKm 116.8 (Figure 3.10). This fish remained near the Sinkut River until late April 2002. Similar to *Males 20-2* and *20-8*, this fish exhibited an upstream movement past Vanderhoof during early June and was located at rKm 140.5 on 7 June, with a subsequent rapid movement downstream of the Stuart River to rKm 79 by 19 June. On 20 June, the sturgeon was monitored moving upstream past the ground station at the Nechako/Stuart confluence, where it entered the Stuart River and continued past the upper Stuart River ground station (rKm 104.6) on 24 June. This fish was not located subsequently, but is assumed to be in Stuart Lake.

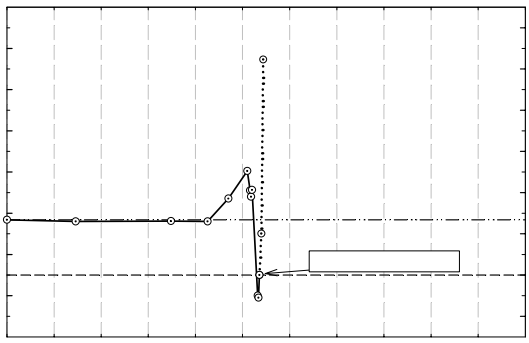


Figure 3.10 Summary of movements in 2001 to 2002 for white sturgeon *Male 20-9* in the Nechako River study area.

MALE 20-10

A white sturgeon captured on 29 September 2001 at rKm 115.1 was determined to be a late reproductive male that measured 162.5 cm and weighed 35.4 kg (Figure 3.11). This male remained near the Sinkut River until mid-May 2002 when it was located downstream near Keillor's Point and quickly moved upstream to below Vanderhoof by 28 May. It then reversed direction and moved downstream below the Stuart River to rKm 81 by 7 June and frequented the area down to rKm 73.3 until 1 July. The fish then began a general upstream movement to the main overwintering hole at rKm 116. These downstream movements below the Stuart River are assumed due to feeding.

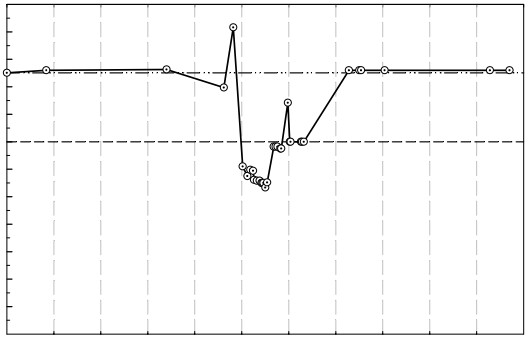


Figure 3.11 Summary of movements in 2001 to 2003 for white sturgeon *Male 20-10* in the Nechako River study area.

MALE 20-11

A large (228 cm FL) white sturgeon was captured on 26 September 2001 at rKm 116.8. Upon surgical examination, the fish was assessed to be a late reproductive male and was implanted with a radio transmitter. As was the case with many of the tagged male fish, this sturgeon migrated upstream in late May 2002 (Figure 3.12), moved upstream past Vanderhoof to rKm 140.5, but then continued further upstream to rKm 149.5. Through June, this sturgeon exhibited general downstream movements and was subsequently located at rKm 123.8 on 3 July and 25 July, 2002. The fish has subsequently not been located.

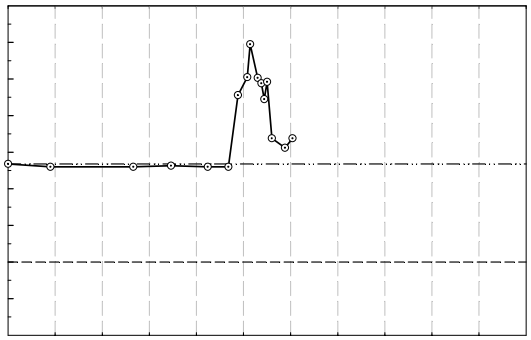


Figure 3.12 Summary of movements in 2001 to 2002 for white sturgeon *Male 20-11* in the Nechako River study area.

MALE 20-12

This late reproductive male was captured near the Sinkut River at rKm 115.2 on 1 October 2001 (Figure 3.13). This sturgeon remained at the overwintering location until mid-May before moving upstream to rKm 130.9 below Vanderhoof. The sturgeon exhibited a rapid downstream movement to rKm 66.3 (20 June 2002) to an area where a mature female (*Female 20-4*) had been holding for an extended period. It is believed that this downstream movement was likely spawning related based on the timing and extent of the movement, the reproductive condition of the fish, suitable water temperature and discharge conditions (Figure 3.14), a potentially suitable spawning location (i.e., rapids upstream of Isle Pierre ferry crossing), and the presence of a mature female fish in the vicinity of this location. On 22 June 2002, this male continued downstream to its last monitored location at rKm 58.2.

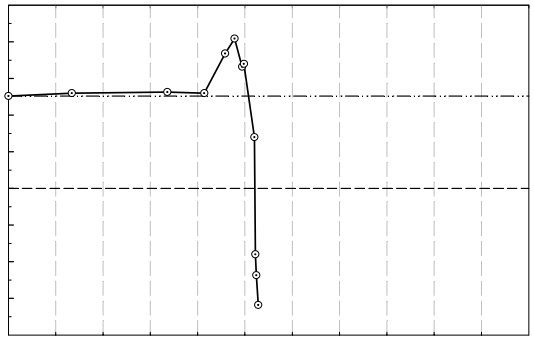


Figure 3.13 Summary of movements in 2001 to 2002 for white sturgeon *Male 20-12* in the Nechako River study area.

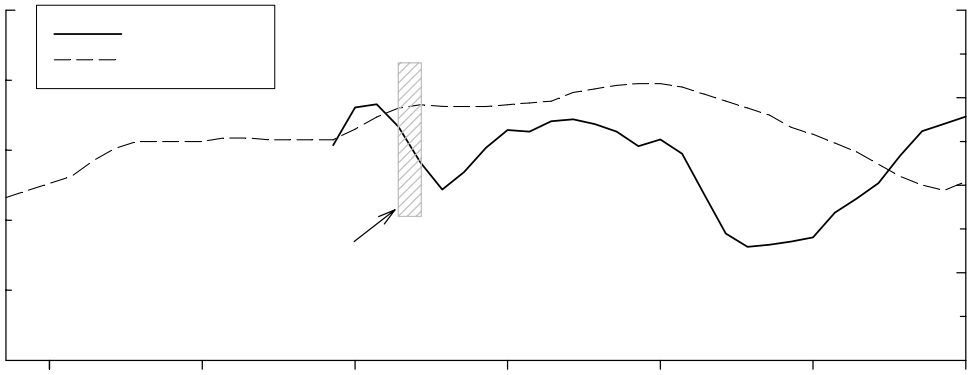


Figure 3.14 Water temperature and discharge during a suspected spawning event for *Male 20-12* and *Female 20-4* in the Nechako River near Isle Pierre, 2002.

MALE 20-13

A late reproductive male white sturgeon was captured on 13 October 2001 at rKm 124.7 (Figure 3.15). After tagging, this fish was located downstream near Hutchinson Creek at rKm 70 on 10 November 2001. However, in mid-December, this fish returned to its point of capture to overwinter. The fish likely was in search of suitable overwintering habitat during late fall 2001, as the area near Hutchinson Creek is suspected of being a secondary overwintering location. In spring 2002, this fish exhibited a wide range of movements

(likely feeding movements) from upstream of Vanderhoof (the braided section), downstream to Hulatt Rapids, and back upstream to the Vanderhoof area. It then moved downstream to near the Nechako/Stuart confluence during the summer. By 28 September 2002, the fish had moved into the overwintering location near the Sinkut River, but was relocated at an identified overwintering hole downstream of Vanderhoof during late February 2003.

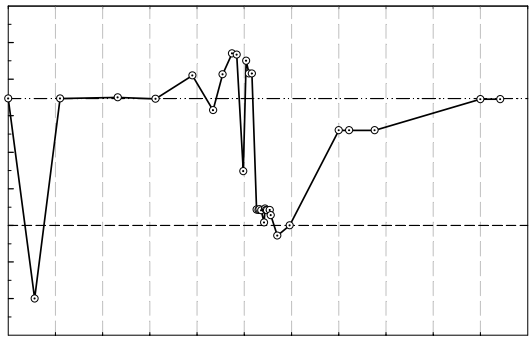


Figure 3.15 Summary of movements in 2001 to 2003 for white sturgeon *Male 20-13* in the Nechako River study area.

MALE 20-15

Sturgeon 20-15 was a late reproductive male white sturgeon captured on 13 October 2001 at rKm 116.2 (Figure 3.16). This fish spent most of its time near the point of capture, but exhibited sporadic summer movements, located below Vanderhoof at rKm 126.2 on 5 June 2002, and at rKm 132.3 on 25 July. This male was last recorded at rKm 116 at the Sinkut River overwintering location on 18 March 2003.

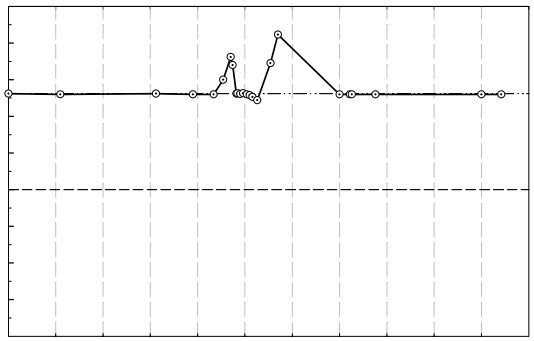


Figure 3.16 Summary of movements in 2001 to 2003 for white sturgeon *Male 20-15* in the Nechako River study area.

3.4.1.2 Monitoring of Female Sturgeon

Three white sturgeon assessed as mature or maturing females, captured during the fall 2001 program, were implanted with radio transmitters. An additional female in late stages of development was also tagged during summer 2002. Two of the females were captured at approximately rKm 125 (secondary overwintering location), one was caught at rKm 115.2 near the Sinkut River. A fourth female, from the summer 2002 session, was captured immediately downstream of the Stuart River.

FEMALE 20-4

This late vitellogenic female white sturgeon was captured on 22 September 2001 at rKm 115.2 (Figure 3.17). This fish measured 175.0 cm FL and weighed 42.2 kg. After tagging, this female remained at the overwintering hole until late May before making a brief upstream movement to rKm 133.6 below Vanderhoof. This fish then proceeded downstream to rKm 66.3 where she appeared to stage for a one-week period in mid-June. The habitat downstream of the staging area consisted of deep rapids followed by deep run habitat; this area was considered potentially suitable white sturgeon spawning habitat.

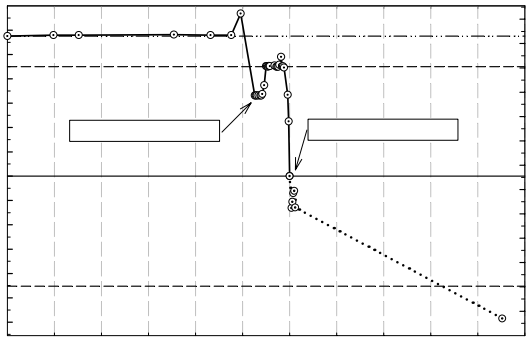


Figure 3.17 Summary of movements in 2001 to 2003 for white sturgeon *Female 20-4* in the Nechako River study area.

Between 19 and 20 June, a mature male sturgeon (*Male 20-12*) was radio tracked and located in close proximity to the mature female. Immediately after this short time period, the female began to move upstream, and the male continued downstream. The female continued upstream to the Stuart River confluence. The fish remained near the Stuart River confluence until mid-July when she moved rapidly downstream and entered the Fraser River mainstem. Localized movements were observed in the area upstream of Fort George Canyon and the fish was located on 25 July 2002 at rKm 765.2.

The water temperature was declining and the discharge was stabilizing (Figure 3.14) when the male was located in close proximity to the female. These environmental cues were contrary to typical spawning conditions reported in the literature, but the water temperature was within the optimal range of 14-17°C documented for white sturgeon spawning in the middle Columbia River (RL&L 1995). White sturgeon eggs or larvae were not collected by egg collection mats or drift net samplers to confirm the event; however, it is suspected that spawning may have occurred.

After consultation with BC MWLAP personnel, a decision was made to attempt to capture the sturgeon to confirm if she had spawned. Despite considerable additional effort to recapture the female, this effort was not successful. It is speculated that the movement into the Fraser River was feeding related, intercepting upstream migrations of salmon, as the salmon have historically entered the Nechako River and reached the Isle Pierre Rapids area by mid-July (Byron Nutton, pers. Comm.). During a recent BC MWLAP bull trout tracking flight on 2 March 2003, the female was located at rKm 674.0 of the Fraser River, downstream of the Blackwater River.

FEMALE 20-5

Sturgeon 20-5 was captured on 24 September at rKm 124.7 and was determined to be in the late stages of early vitellogenesis (Figure 3.18). Although the fish would not spawn in 2002, it would likely spawn in 2003 and as such, was implanted with a radio transmitter. This fish spent the winter period at the overwintering location near the Sinkut River and spent the spring and early summer 2002 period between Vanderhoof and Keillor's Point. This female was located at the Stuart River confluence during August and early September before returning to overwinter (2002 to 2003) at the Sinkut River location.

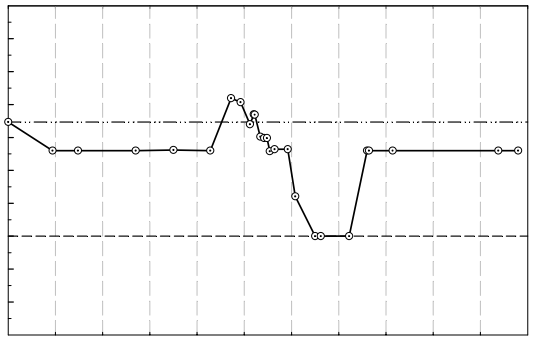


Figure 3.18 Summary of movements in 2001 to 2003 for white sturgeon *Female 20-5* in the Nechako River study area.

FEMALE 20- 7

A large (203 cm FL) female white sturgeon was captured on 23 September 2001 at rKm 125.1. Although no eggs were observed on the right side, this fish was considered a late vitellogenic female due to the colour, size and development of the eggs in the left ovary. This fish moved downstream after tagging to overwinter in the primary location near the Sinkut River where it remained until after 22 June 2002 (Figure 3.19). It then moved downstream to the Finmoore area for the remainder of the summer period, and then moved back upstream to the overwintering location for winter 2002 to 2003.

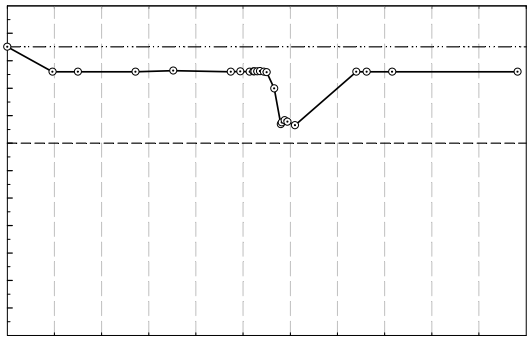


Figure 3.19 Summary of movements in 2001 to 2003 for white sturgeon *Female 20-7* in the Nechako River study area.

FEMALE 1-24

During set line efforts to recapture the *Female 20-4*, another late vitellogenic female was encountered. This female was captured at rKm 88.7 on 13 July 2002 and implanted with a radio transmitter. This fish remained in the Stuart confluence area for the summer, but had migrated upstream to overwinter at rKm 116 by 9 October 2002 (Figure 3.20).

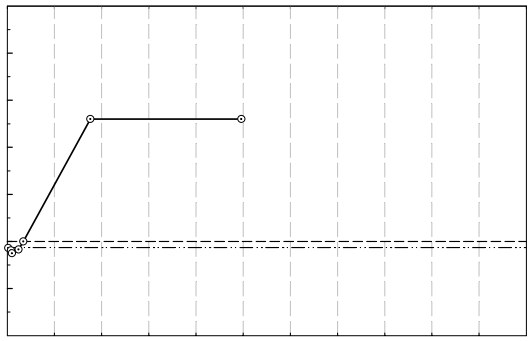


Figure 3.20 Summary of movements in 2002 to 2003 for white sturgeon *Female 1-24* in the Nechako River study area.

3.5 Spawning Assessment

3.5.1 Egg and Larval Fish Collections

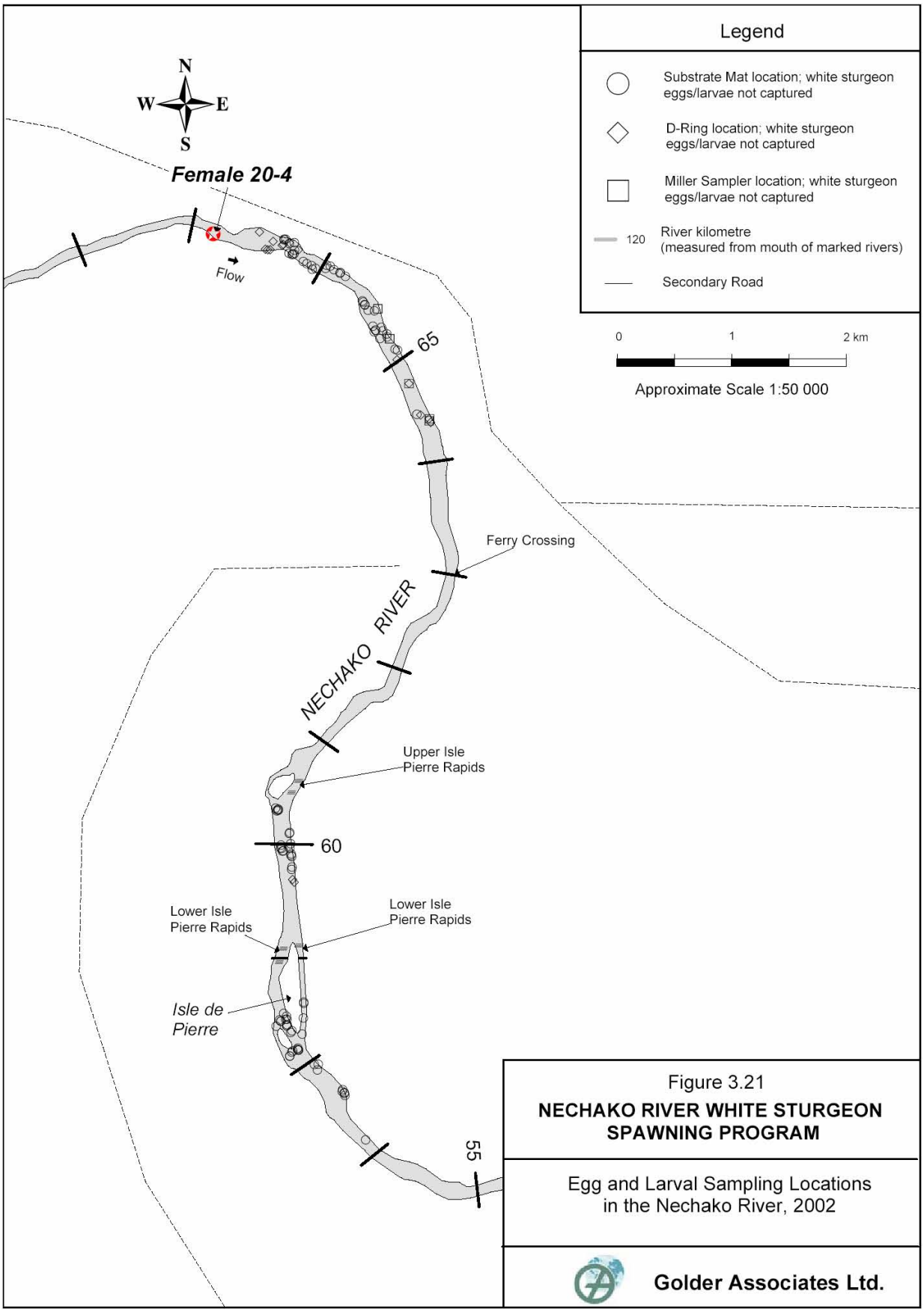
Egg collection mats, D-ring drift nets, and Miller high speed plankton samplers were deployed during the spring and summer sessions to sample for white sturgeon eggs and/or larvae (Figures 3.21 and 3.22). Egg collection mats (single and double mat configurations) were deployed between 11 June and 14 July 2002, downstream of suspected spawning areas (Appendix B, Table B4). The majority of sampling effort (86.8%) was conducted in the Isle Pierre Rapids area between rKm 58.0 and 65.4, and focused on one mature female sturgeon (*Female 20-4*), located by telemetry monitoring, holding in a deep-water habitat at rKm 66.3 (Figure 3.21). The habitat immediately downstream of the position of this fish was considered suitable for white sturgeon spawning based on fast, turbulent water (egg dispersal) and small isolated areas of slower velocity (for eggs to settle).

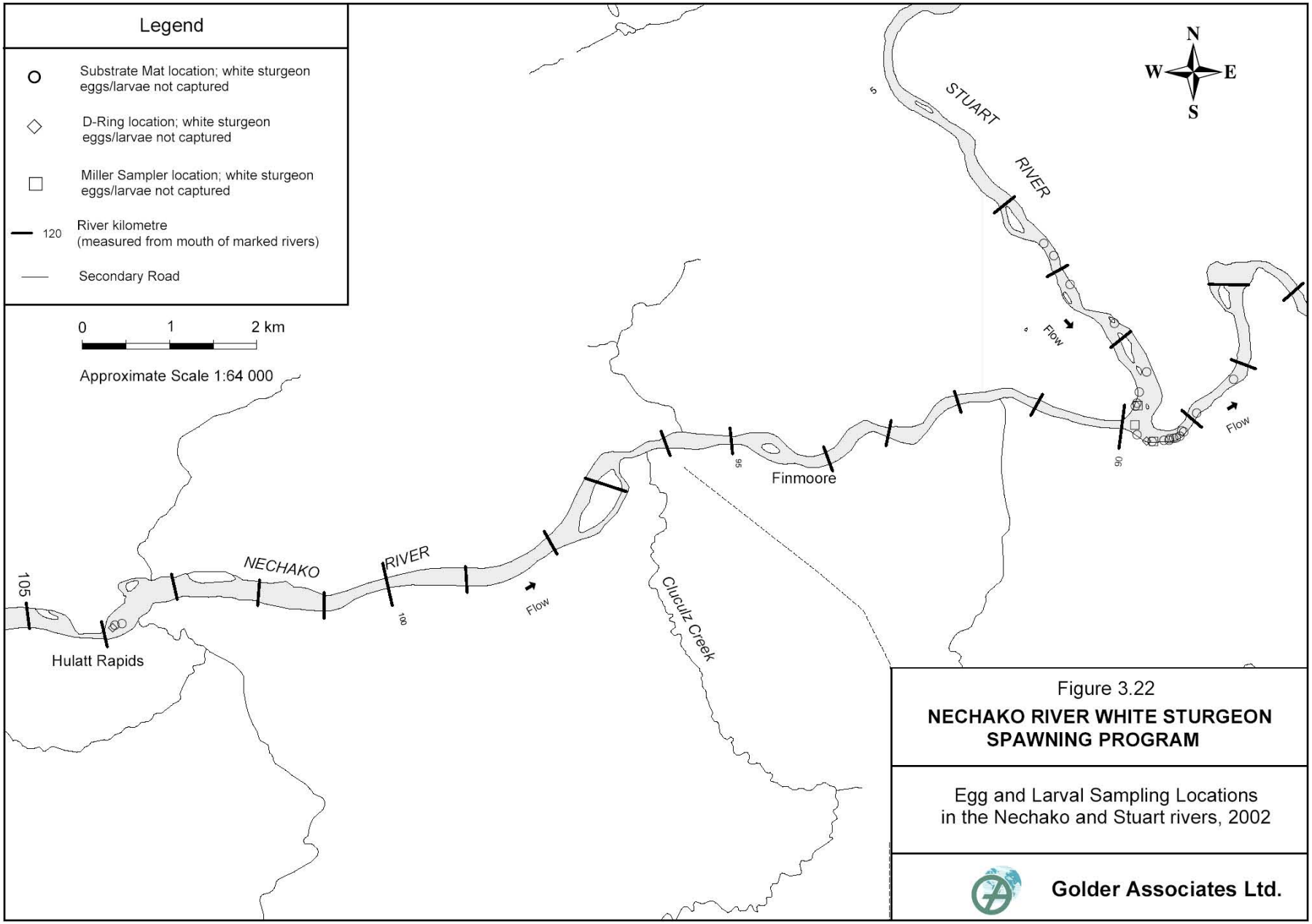
Based on the movements, behaviour and location of other radio implanted sturgeon, additional egg collection activities were conducted within the lower 2.5 km of the Stuart River, the Stuart/Nechako River confluence (rKm 89.0) and at Hulatt Rapids (rKm 103.8), although the potential spawning habitat in these areas was not considered as suitable as the Isle Pierre Rapids area.

Despite considerable egg collection mat sampling effort (11 131 h) in the Nechako and lower Stuart rivers, no white sturgeon eggs or larvae were captured (Table 3.2; Appendix B, Table B4). Non-sturgeon eggs were captured at 13 locations in the study area; most of the eggs (66%) were from downstream of Isle Pierre Rapids.

Table 3.2 Summary of egg collection mat effort (h) expended in the Nechako and Stuart rivers, 2002.

Location	Date	Sample Effort (hours)	Non-Sturgeon eggs


Legend
Substrate Mat location; white sturgeon eggs/larvae not captured
D-Ring location; white sturgeon eggs/larvae not captured
Miller Sampler location; white sturgeon eggs/larvae not captured
120 River kilometre (measured from mouth of marked rivers)
Secondary Road
0 1 2 km
Approximate Scale 1:50 000
N
W E
S
Female 20-4
Flow
65
Ferry Crossing
NECHAKO RIVER
Upper Isle Pierre Rapids
60
Lower Isle Pierre Rapids
Lower Isle Pierre Rapids
Isle de Pierre
55
Figure 3.21
NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM
Egg and Larval Sampling Locations in the Nechako River, 2002
Golder Associates Ltd.


Legend
Substrate Mat location; white sturgeon eggs/larvae not captured
D-Ring location; white sturgeon eggs/larvae not captured
Miller Sampler location; white sturgeon eggs/larvae not captured
120 River kilometre (measured from mouth of marked rivers)
Secondary Road
0 1 2 km
Approximate Scale 1:64 000
N
W E
S
STUART RIVER
Flow
Flow
Finmoore
95
95
NECHAKO RIVER
105
100
Flow
Hulatt Rapids
Cluculz Creek
Figure 3.22
NECHAKO RIVER WHITE STURGEON SPAWNING PROGRAM
Egg and Larval Sampling Locations in the Nechako and Stuart rivers, 2002
Golder Associates Ltd.

D-ring drift nets were deployed occasionally as a supplemental sampling technique to collect eggs or larval stages of white sturgeon. Drift net sampling was conducted only in the Nechako River, with most effort expended in the Isle Pierre area. Drift nets were deployed for a total effort of 6.08 h (Appendix B, Table B4). Unidentified eggs (*n*=1) and fry (*n*=18), and rainbow trout juveniles (*n*=4) were collected during the sampling; none of the samples were identified as white sturgeon. All of the samples were collected from the Isle Pierre area.

Miller high speed samplers were used in addition to the drift nets in an attempt to collect spawned eggs and emergent larvae. Effort was divided between the Stuart/Nechako River confluence and the Isle Pierre area. A total of seven non-sturgeon fry were sampled during 13.57 h of effort (*CPUE* of 3.06 eggs and fry/m^3 x 10^3).

3.5.2 Mark-Recapture Data

3.5.2.1 Tagging

A total of 64 white sturgeon were captured or observed during the 2001 to 2002 sampling program; most (93.8%) were sampled during the fall 2001. Two fish were observed as they escaped near the boat; a third fish was released with no data collected (except for tag number). T-anchor tags and PIT tags were applied to 71.7% (*n*=53; includes recaptured fish that lost the original tag) and 62.5% (*n*=40), respectively (Table 3.3; Appendix C, Table C1).

Table 3.3 Summary of mark and recapture events for white sturgeon marked with conventional tags in the Nechako River by Golder, 2001 to 2002.

Session	Number Caught	No. Tagged [a]		No. Recaptured [b]	
		T-anchor	PIT	No.	%
Total	64	53	40	24	37.5

3.5.2.2 Tagged Fish Recapture

Twenty-four white sturgeon (37.5% of the catch) had been previously conventionally tagged (PIT or T-anchor tag) by either RL&L (Golder) or the Lheidli T'enneh (Appendix C, Table C4). Most (87.5%) of the recaptured fish were encountered in the fall

of 2001. All of the net downstream movements during the fall (*n*=5) were less than 10 rKm, however, net downstream movements of recaptured fish during the summer (*n*=3) period were greater than 20 rKm. Two fish exhibited net movements of greater than 100 rKm since the last encounter. The number of days-at-large for white sturgeon recaptured in 2001 to 2002 ranged between 6 and 2492 days.

Ten white sturgeon recaptured during the present study had been recaptured on two previous occasions; one had been captured on three previous occasions. One sturgeon was originally tagged at rKm 0.5 of the Nechako River by the Lheidli T'enneh in July 2000 and recaptured in October 2001, with a net upstream movement of 124.2 rKm. In September 2001, a sturgeon was recaptured at rKm 125.2 of the Nechako River; this fish was originally tagged at rKm 760 of the Fraser River in August 1998. The days-at-large for this fish since its original capture was 2226 days, with a net upstream migration of 155.2 km. Notable movements by fish with radio transmitters included two fish moving upstream into Stuart Lake, and the movement into the Fraser River by the female sturgeon (*20-4*) suspected of spawning.

4.0 SUMMARY

As part of the Nechako River white sturgeon recovery planning process, the Ministry of Water, Land and Air Protection (BC MWLAP) initiated a white sturgeon radio telemetry program for the Nechako River in 2001. The program was organized into capture, monitoring, and egg sampling phases with the objective of determining potential spawning areas and assessing sturgeon spawning success.

Sixty-four white sturgeon were captured or observed in the Nechako River in 2001 and 2002. Of these, a total of 15 sturgeon were surgically implanted with radio transmitters, including 11 males, and four females. Although surgical examinations were limited to larger fish suspected of being in an advanced stage of sexual maturity, many fish were in the earlier stages of reproductive development. Males were most common in the surgically examined portion of the catch.

Based on the monitoring data for the radio-tagged fish, several movement trends were noted during the study. During the early spring period, there were general upstream movements recorded from the overwintering locations towards Vanderhoof (Appendix D, Figure D1). The movements of several males (*Males 20-2, 20-8, 20-9*) to the Vanderhoof area were similar in timing and extent, and although these movements may have been related to discharge and water temperature cues important to spawning, the reasons for these movements are not clear. The instream habitat of the Nechako River upstream of the braided section consisted of run habitat with moderate laminar flow and sand and gravel substrate; no areas of typical spawning habitat were identified within this section.

During late May and early June, several sturgeon utilizing the Vanderhoof area, including *Males 20-2, 20-8, 20-9, 20-10* and *Female 20-4,* exhibited a rapid dispersal downstream towards the Stuart River confluence. Extended downstream movements were documented for many of these fish to the area upstream of Hutchinson Creek. Due to the timing and extent of the movement, these downstream migrations may have been triggered by spawning behaviour, although potential spawning habitat was not identified in this section of the river. The instream habitat in this area was characterized by moderate laminar flows, with a relatively straight channel pattern and 'U'-shaped channel profile. The depths were generally less than 5 m. Lower banks were composed of fines and gravel substrate.

After approximately two weeks in the Hutchinson Creek area, the male sturgeon re-located upstream to near the Stuart River confluence. Many of these fish appeared to remain near the confluence, but *Males 20-8* and *20-9* were documented moving into the Stuart River and continued upstream into Stuart Lake. Unlike the other fish, *Males 20-6* and *20-12* did not return to the Stuart River confluence, but instead continued further

downstream past Isle Pierre. The movement of *Male 20-12* may have been spawning related due to the possible interaction with *Female 20-4*.

One female white sturgeon (*20-4*) was suspected of spawning, based on: 1) her close proximity to suitable habitat; 2) timing of movements and behaviour (i.e., migration out of spawning area after suspected contact with *Male 20-12*); and 3) extended movements after the suspected event, upstream to the Stuart River and down into the Fraser River. Despite considerable egg/larval sampling effort downstream of the female's position, no eggs or larvae were retrieved. Subsequent efforts to recapture the female to confirm if she had released her eggs within the Nechako River were unsuccessful. White sturgeon eggs or fry were not encountered during egg and larval sampling of three other locations in the Nechako River.

By the end of September, a majority of the tagged sturgeon still within the Nechako River had begun or completed upstream migrations to the primary overwintering area located near the Sinkut River.

Results of the 2001 to 2002 adult capture and telemetry program components indicated a broader distribution of fish than previously documented in the system. Movement data from six fish during the telemetry component of the present study suggest a higher use of the area upstream of Vanderhoof between the braided section in the Migratory Bird Sanctuary and the Highway 27 bridge during the early spring. Movements of two fish through the Stuart River into Stuart Lake during summer also provide evidence of higher use of the Stuart River drainage and more interaction between groups of fish in the Nechako-Stuart drainage. A recapture event in the Nechako River from a fish captured and tagged originally in the Fraser River near Red Rock Creek and the movement of another fish into the Fraser River from the Nechako River suggest a more open system than originally reported. Because of their long lifespan and the extended period of time required for maturation, it is likely that a full understanding of the movements associated with various life history stages and behaviour of white sturgeon in the study area will require many years of observation.

Observations of mature white sturgeon within the Nechako River during 2001 to 2002 identified some distinct movement trends, many of which were seasonal and which appeared to be influenced by the difference in physical (water temperature and discharge) conditions in the upper and lower river. Although spawning areas were not confirmed by sampling, one spawning event was suspected to have occurred in the Nechako River near Isle Pierre.

5.0 STUDY RECOMMENDATIONS

Based on the results of the 2001 to 2002 Nechako River White Sturgeon Spawning Program, it is recommended future programs focus on the following:

1. Continue annual spawning success indexing for Nechako white sturgeon to develop additional baseline information on spawning cues, frequency and success. Assessments should include an early spring adult capture program, continued transmitter implantation of fish likely to spawn each spring, and sampling to collect sturgeon eggs and larvae. Physical habitat parameters at egg and larvae collection sites should be measured, including water depth, substrate type, and mean water column velocity.
2. Use of egg and larval sampling in non-traditional spawning habitat and correlation with early spring water temperature and discharge environments. Sampling should not be restricted to classic spawning habitat criteria, but reflect the results of the telemetry data.
3. Continue to periodically monitor the movements of radio/acoustic tagged fish in the Nechako basin via aerial and/or ground tracking. Tracking efforts should be intensified prior to, during, and immediately following the spawning period.
4. Emphasis on the definition and protection of critical overwintering habitat identified in this and other recent Nechako River studies, according to forthcoming Species at Risk Legislation (SARA). Use underwater camera technology (ROV systems) to record habitat conditions and fish behaviour in these areas with minimal disturbance.
5. Co-ordinate with other white sturgeon studies in the Nechako River basin and upper Fraser River to maximize sampling effort and collection of scientifically defensible data as drainage-wide initiatives, especially with recent evidence of migrations into the Fraser and Stuart river systems.
6. Coordinate sampling programs with programs proposed by the Recovery Team of the Nechako White Sturgeon Recovery Initiative to maximize sampling effort and offset costs (e.g., altered flow or temperature experiments).
7. Support the educational process implemented through the Nechako White Sturgeon Recovery Initiative to inform northern communities of the sturgeon recovery initiatives. This may allow additional research opportunities, such as the establishment of a ground station on the Tachie River.
8. Investigate plausible hypothesis for the reduction or elimination of spawning events in the Nechako basin as they relate to temperature and discharge. This should include a thorough review of temperature and discharge data as these data related to recorded sturgeon behaviour and movement records in the Nechako River basin.

9. Expand the permanent shore base station array within the Nechako basin to more rigorously monitor seasonal movements of radio tagged white sturgeon and to better define the geographic boundary of recovery efforts. Each station should be configured to monitor radio and/or acoustic tags. Shore base stations are recommended at the following sites:
    - Nechako/Nautley Confluence,
    - Stuart/Nechako confluence,
    - Outlet of Stuart Lake,
    - Inlet of Stuart Lake/Tachie River,
    - Nechako River at Isle Pierre Rapids, and
    - Nechako/Fraser Confluence.

10. Establish early spring/early summer temperature and flow monitoring stations in the vicinity of potential Nechako white sturgeon spawning locations in the Nechako basin.
11. Develop a larval young-of-the-year and juvenile capture program as part of a juvenile Nechako white sturgeon year-class abundance index or annual recruitment index to assess the occurrence and success of spawning events in the Nechako basin.
12. Closely monitor the movements of *Female 20-4* in 2003 and attempt to recapture to verify if this fish spawned in 2002.
13. Age pectoral fin ray sections collected from Nechako white sturgeon sampled in 2001 and 2002 to supplement existing age-at-length and age-at-maturity data for the stock
14. Collect gonadal tissue and blood from white sturgeon surgically assessed for sex and stage of maturity. Samples can be used to sex and stage gonadal maturity using blood plasma indicators. This information is useful for validating visual examinations of maturing fish surgically assessed in the field.
15. Continue to collect tissue samples from Nechako white sturgeon to further refine the genetic characteristics of the stock (genetic divergence within range, genetically meaningful management units, extent of hybridization) using electrophoretic or DNA analysis.

6.0 CLOSURE

This report was prepared by Golder Associates Ltd. (Golder) for the British Columbia Ministry of Water, Land and Air Protection in Prince George. The material in it reflects Golder's best judgment 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 based on this report.

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7.0 LITERATURE CITED AND PERSONAL COMMUNICATIONS

Beamesderfer, R.C., J.C. Elliot, and C.A. Foster. 1989. Report A In: A.A. Nigro (ed). Status and habitat requirements of white sturgeon populations in the Columbia River downstream from McNary Dam. Annual Progress Report. Bonneyville Power Admin. Portland, Or.

Conte, F.S., S.I. Doroshov, P.B. Lutes, and E.M. Strange. 1988. Hatchery manual for the white sturgeon, *Acipenser transmontanus* Richardson with application to other North American Acipenseridae. Cooperative Extension, University of California, Division of Agriculture and Natural Resources, Publication 3322: 103 p.

Dixon, B.M. 1986. Ministry of Environment, Fisheries Branch. Age, growth and migration of white sturgeon in the Nechako and Upper Fraser rivers of British Columbia. Fisheries Technical Circular No. 70. Fish and Wildlife Branch, Prince George, BC 27 p.

Golder Associates Ltd. 2001. Nechako River White Sturgeon Monitoring Workplan. Prepared for BC Ministry of Water, Land & Air Protection, Prince George, BC. 9 p.

Korman, D.W. and C. Walters. 2001. Nechako River White Sturgeon Recovery Planning: Summary of Stock Assessment and Oct. 2 to 3 2000 Workshop.

Lheidli T'enneh First Nation. 2000. Preliminary Assessment of Upper Fraser River White Sturgeon. Prepared for Fisheries Renewal British Columbia and the Upper Fraser Nechako Fisheries Council. Final Report: 26 p. + 6 app.

Nechako White Sturgeon Recovery Team. 2003 (In Press). Recovery Plan for Nechako White Sturgeon. Prepared by Golder Associates Ltd.

Pollard, S. 2000. Fraser River White Sturgeon Genetic Results – Implications to Stock Structure. Unpublished Report Prepared for BC Fisheries, Conservation Section, Victoria, B.C. 4p.

RL&L Environmental Services Ltd. 2000a. Fraser River White Sturgeon Monitoring Program - Comprehensive Report (1995 to 1999). Final Report Prepared for BC Fisheries. RL&L Report No. 815F: 85 p + app.

RL&L Environmental Services Ltd. 2000b. Fraser River white sturgeon monitoring program. Region 7 (Omineca-Peace) – 1999 Data Report. Prepared for BC Ministry of Environment, Lands and Parks, Fish and Wildlife Section, Prince George, BC. RL&L Report No. 742F: 32 p. + 5 apps.

RL&L Environmental Services Ltd. 1999. Fraser River white sturgeon monitoring program. Region 7 (Omineca-Peace) - 1998 investigations. Prepared for BC Ministry of Environment, Lands and Parks, Fish and Wildlife Section, Prince George, BC. RL&L Report No. 646F: 26 p. + 6 apps.

RL&L Environmental Services Ltd. 1998. Fraser River white sturgeon monitoring program. Region 7 (Omineca-Peace) - 1997 investigations. Prepared for BC Ministry of Environment, Lands and Parks, Fish and Wildlife Section, Prince George, BC. RL&L Report No. 565F: 36 p. + 6 apps.

RL&L Environmental Services Ltd. 1997. Fraser River white sturgeon monitoring program. Region 7 (Omineca-Peace) - 1996 investigations. Prepared for BC Ministry of Environment, Lands and Parks, Fish and Wildlife Section, Prince George, BC. RL&L Report No. 520F: 78 p. + 7 apps.

RL&L Environmental Services Ltd. 1996. Fraser River white sturgeon monitoring program. 1995 Data Report. Report Prepared for BC Ministry of Environment, Lands and Parks, Fisheries Branch. Victoria, BC. RL&L Report No. 465F: 54 p. + 7 apps.

RL&L Environmental Services Ltd. 1995. White Sturgeon in the Columbia River, BC. 1994 study results. Report prepared for B.C. Hydro, Environmental Affairs, Vancouver, B.C. Report 377-94: 77p. + 4 app.

Schrek, C.B., and P.B. Moyle, editors. 1990. Methods for fish biology. American Fisheries Society, Bethesda, Maryland.

Slaney, P.A., C.J. Perrin, and B.R. Ward. 1986. An assessment of the rainbow trout (*Salmo gairdneri*) population of the upper Nechako River and the effects of a sport fishery closure. BC Ministry Environment, Fisheries Management. Report 89, 37 p.

Triton Environmental Consultants Ltd. 2003. The 2001 summer water temperature and flow management project. Nechako Fisheries Conservation Program Technical Report N0. RM01-1: 12p. + 5 app.

PERSONAL COMMUNICATION

Barnes, Dave. Cultus Lake Salmon Research Laboratory, Government of Canada. 28 January 2003.

Nutton, Byron. Fisheries and Oceans Canada, Habitat and Enhancement Branch, Prince George, BC. 22 May 2003.

APPENDIX A

DISCHARGE AND WATER TEMPERATURE DATA

Table A1 Summary of sample period for temperature and discharge data collected by Golder Associates, Department of Fisheries and Oceans and Water Survey of Canada 2001-02.

Parameter	Figure Number	Waterbody	Location (UTM - NAD83)			Sample Period [1]
			Zone	Easting	Northing	
Water Temperature	A2	Nechako River upstream of Stuart River [2]	10U	NA	NA	10 Jul 01 to 20 Aug 01
	A2	Nechako River upstream of Stuart River [3]	10U	462167	5982083	13 Sep 01 to 9 Oct 01; 8 Jun 02 to 3 Sep 02
	A3	Nechako River near Isle Pierre Rapids [3]	10U	484456	5979153	12 Sep 01 to 8 Oct 01; 16 Jun 02 to 6 Nov 02
	A5	Stuart River near Fort St. James [3]	10U	418600	6029000	28 Apr 01 to 21 Sep 01; 16 May 02 to 30 May 02; 6 Jul 02 to 31 Dec 02
	A5	Stuart River near Fort St. James [4]	10U	464460	5982818	5 Jun 02 to 27 Oct 02
	NA [5]	Stuart River near Nechako River confluence [3]	10U	464405	5982903	4 Jun 02 to 27 Oct 02
	A6	Fraser River at Shelley [4]	10U	523600	5983750	28 Apr 01 to 20 Sep 01; 16 May 02 to 16 Jul 02
Discharge [6]	A1	Skins Lake Spillway	10U	304240	5962120	1 Jan 01 to 31 Dec 02
	A1	Nechako River below Cheslattta Falls	10U	378776	5949917	1 Jan 01 to 20 Mar 02; 8 Apr 02 to 31 Dec 02
	A2	Nechako River at Vanderhoof	10U	433983	5986897	1 Jan 01 to 31 Dec 02
	A3	Nechako River near Isle Pierre Rapids	10U	484456	5979153	1 Jan 01 to 4 Dec 02
	A4	Nautley River near Fort Fraser	10U	395376	5994193	1 Jan 01 to 31 Dec 01; 26 Mar 02 to 22 Oct 02
	A5	Stuart River near Fort St. James	10U	417266	6030785	1 Jan 01 to 26 Jan 02; 24 Apr 02 to 31 Dec 02
	A6	Fraser River at Shelley	10U	525027	5984812	1 Jan 01 to 11 Dec 02

[1] Data available at time of reporting.
[2] Temperature data near Finmoore from Triton (2003).
[3] Temperature logger deployed and maintained by Golder Associates.
[4] Temperature data provided by Department of Fisheries and Oceans.
[5] Data similar to upper Stuart River, therefore not graphically represented.
[6] Discharge data provided by Water Survey of Canada.

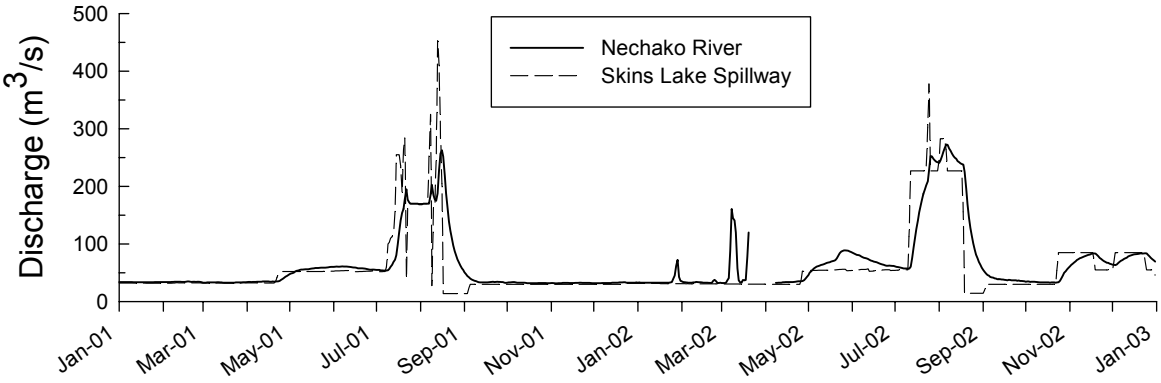

Figure A1 Mean daily discharge for Skins Lake Spillway and the Nechako River below Cheslatta Falls, 2001-02. Discharge data obtained from Water Survey Canada, (Unpublished data).

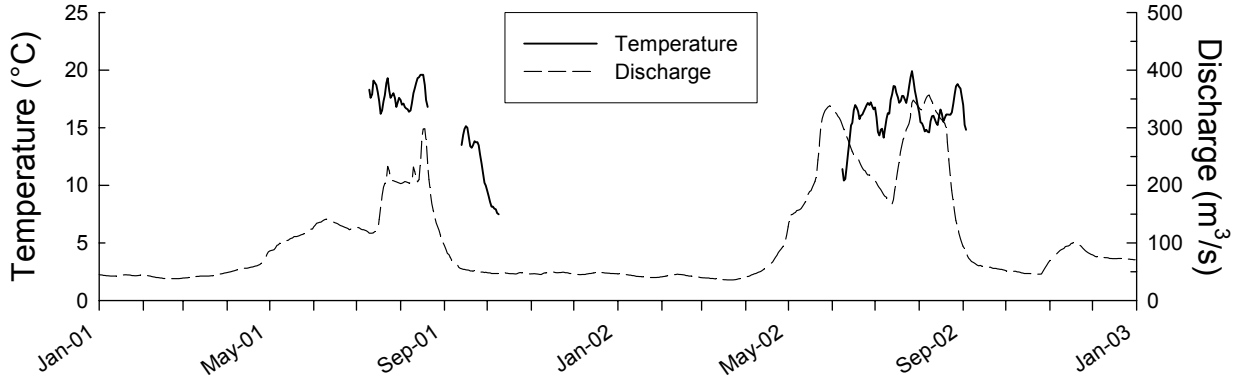

Figure A2 Mean daily water temperature for the Nechako River upstream of the Stuart River and discharge for the Nechako River at Vanderhoof, 2001-02. Temperature data obtained from Golder Associates temperature logger and Triton (2003); discharge data from Water Survey Canada (Unpublished data).

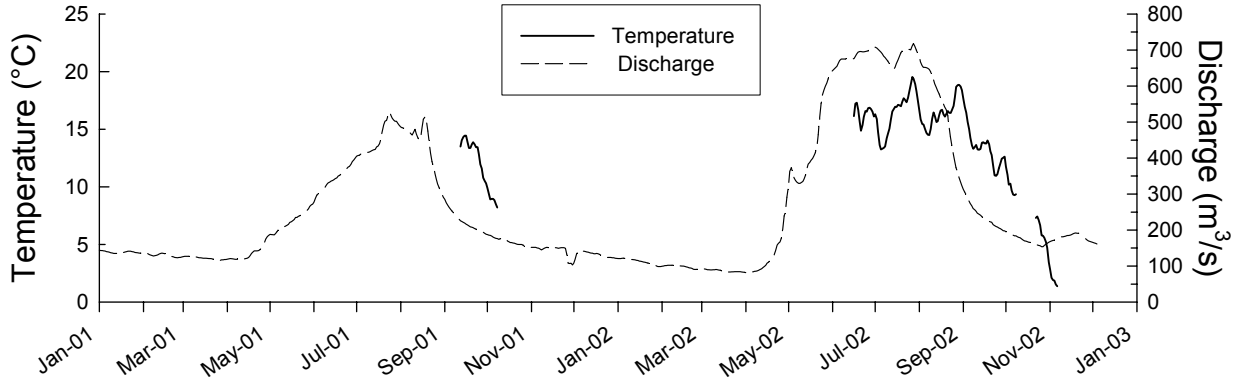

Figure A3 Mean daily water temperature and discharge for the Nechako River at Isle Pierre, 2001-02. Temperature data obtained from Golder Associates temperature logger (downstream of Stuart River confluence); discharge data from Water Survey Canada (Unpublished data).

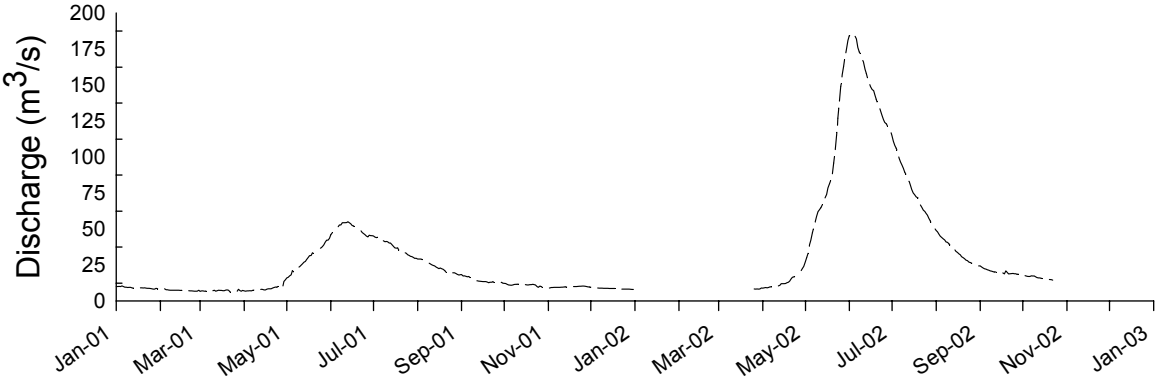

Figure A4 Mean daily discharge for the Nautley River near Fort Fraser, 2001-02. Discharge data obtained from Water Survey Canada (Unpublished data).

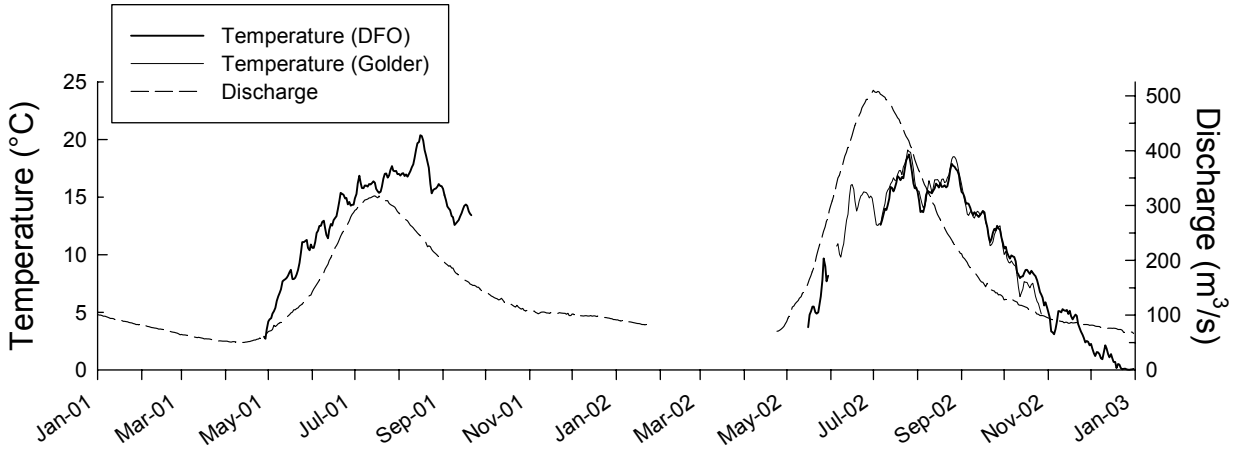

Figure A5 Mean daily water temperature and mean daily discharge for the Stuart River at Fort St. James, 2001-02. Temperature data obtained from D.F.O. and Golder Associates temperature loggers; discharge data from Water Survey Canada (Unpublished data).

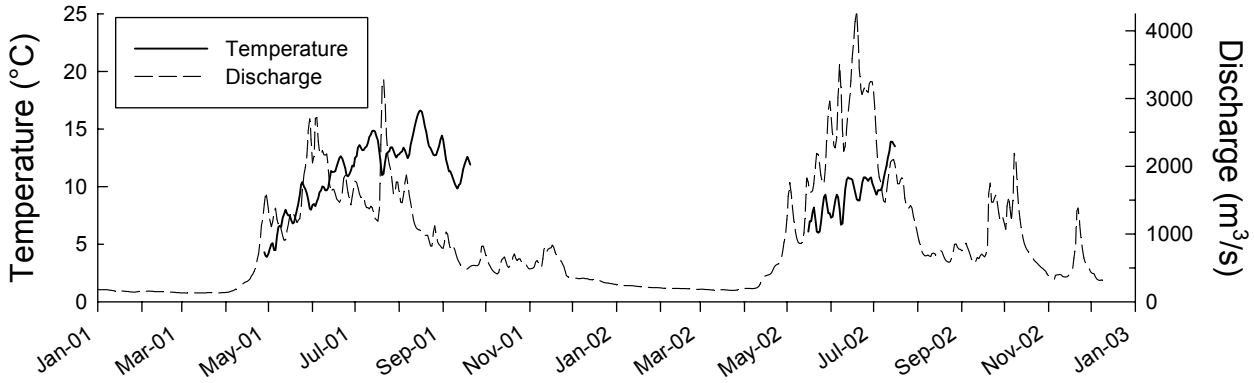

Figure A6 Mean daily water temperature and discharge for the Fraser River at Shelley, 2001-02. Temperature data obtained from D.F.O. temperature logger (Unpublished data); discharge data obtained from Water Survey Canada (Unpublished data).

APPENDIX B

CAPTURE DATA

Table B1 Summary of catch and catch rate (*CPUE* = No. caught/100 hook-hours) for white sturgeon and northern pikeminnow captured by set line in the Nechako and Fraser rivers, 2001-02.

Waterbody	Season	Station	Set location UTM (NAD 83)			Set		Pulled		Duration	No. of	Hook-	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time	(h)	Hooks	hours	Catch	*CPUE*	Catch	*CPUE*
Nechako River	Fall	SSL-66.2L	10U	482431	5982095	13-Sep-01	11:01	14-Sep-01	11:10	24.15	8	193.20	0	*0.00*	0	*0.00*
		SSL-66.3L	10U	482387	5982128	13-Sep-01	11:25	14-Sep-01	11:27	24.03	8	192.27	0	*0.00*	0	*0.00*
		SSL-67.0R	10U	481830	5982051	13-Sep-01	12:04	14-Sep-01	12:19	24.25	8	194.00	0	*0.00*	0	*0.00*
		SSL-68.3L	10U	480619	5981637	13-Sep-01	12:23	14-Sep-01	12:37	24.23	8	193.87	0	*0.00*	0	*0.00*
		SSL-72.5L	10U	477491	5980391	13-Sep-01	13:04	14-Sep-01	13:19	24.25	8	194.00	0	*0.00*	0	*0.00*
		SSL-74.9R	10U	475241	5979943	13-Sep-01	15:02	14-Sep-01	13:35	22.55	8	180.40	1	*0.55*	0	*0.00*
		SSL-76.1L	10U	474306	5980420	13-Sep-01	15:21	14-Sep-01	14:32	23.18	8	185.47	0	*0.00*	1	*0.54*
		SSL-78.9L	10U	471768	5981580	13-Sep-01	15:42	14-Sep-01	15:20	23.63	8	189.07	0	*0.00*	0	*0.00*
		SSL-66.2L	10U	482431	5982095	14-Sep-01	11:25	15-Sep-01	10:14	22.82	8	182.53	0	*0.00*	0	*0.00*
		SSL-66.3L	10U	482387	5982128	14-Sep-01	12:11	15-Sep-01	10:34	22.38	30	671.50	0	*0.00*	0	*0.00*
		SSL-67.0R	10U	481830	5982051	14-Sep-01	12:33	15-Sep-01	11:10	22.62	8	180.93	1	*0.55*	1	*0.55*
		SSL-68.3L	10U	480619	5981637	14-Sep-01	13:12	15-Sep-01	12:30	23.30	8	186.40	0	*0.00*	0	*0.00*
		SSL-72.5L	10U	477495	5980387	14-Sep-01	13:28	15-Sep-01	12:46	23.30	8	186.40	0	*0.00*	0	*0.00*
		SSL-74.9R	10U	475241	5979943	14-Sep-01	14:30	15-Sep-01	13:20	22.83	8	182.67	0	*0.00*	0	*0.00*
		SSL-76.1L	10U	474334	5980408	14-Sep-01	14:43	15-Sep-01	13:31	22.80	8	182.40	0	*0.00*	0	*0.00*
		SSL-78.4R	10U	472107	5980942	14-Sep-01	15:17	15-Sep-01	13:46	22.48	8	179.87	0	*0.00*	0	*0.00*
		SSL-78.9L	10U	471795	5981568	14-Sep-01	15:32	15-Sep-01	13:58	22.43	8	179.47	0	*0.00*	0	*0.00*
		SSL-83.8L	10U	468172	5983930	15-Sep-01	14:29	16-Sep-01	10:24	19.92	8	159.33	0	*0.00*	0	*0.00*
		SSL-85.1R	10U	466883	5983459	15-Sep-01	14:45	16-Sep-01	10:45	20.00	8	160.00	0	*0.00*	0	*0.00*
		SSL-86.4R	10U	465970	5984180	15-Sep-01	15:03	16-Sep-01	11:04	20.02	8	160.13	0	*0.00*	0	*0.00*
		SSL-88.3R	10U	465594	5982807	15-Sep-01	15:20	16-Sep-01	11:24	20.07	8	160.53	0	*0.00*	0	*0.00*
		SSL-90.0R	10U	464186	5982309	15-Sep-01	15:35	16-Sep-01	11:45	20.17	8	161.33	0	*0.00*	0	*0.00*
		SSL-90.2R	10U	464070	5982320	15-Sep-01	15:48	16-Sep-01	11:57	20.15	8	161.20	0	*0.00*	0	*0.00*
		SSL-90.4R	10U	463930	5982324	15-Sep-01	16:02	16-Sep-01	12:10	20.13	8	161.07	0	*0.00*	0	*0.00*
		SSL-90.6R	10U	463734	5982408	15-Sep-01	16:24	16-Sep-01	12:22	19.97	8	159.73	0	*0.00*	0	*0.00*
		SSL-83.8L	10U	468172	5983930	16-Sep-01	10:38	17-Sep-01	9:49	23.18	8	185.47	0	*0.00*	0	*0.00*
		SSL-85.1R	10U	466883	5983459	16-Sep-01	11:00	17-Sep-01	10:05	23.08	8	184.67	0	*0.00*	0	*0.00*
		SSL-86.4R	10U	465970	5984180	16-Sep-01	11:24	17-Sep-01	10:16	22.87	8	182.93	0	*0.00*	0	*0.00*
		SSL-88.3R	10U	465573	5982788	16-Sep-01	11:40	17-Sep-01	10:33	22.88	8	183.07	0	*0.00*	0	*0.00*
		SSL-90.0R	10U	464186	5982309	16-Sep-01	11:56	17-Sep-01	10:48	22.87	8	182.93	0	*0.00*	0	*0.00*
		SSL-90.2R	10U	464070	5982320	16-Sep-01	12:07	17-Sep-01	11:01	22.90	8	183.20	0	*0.00*	0	*0.00*
		SSL-90.4R	10U	463930	5982324	16-Sep-01	12:20	17-Sep-01	11:16	22.93	8	183.47	0	*0.00*	0	*0.00*
		SSL-90.6R	10U	463734	5982408	16-Sep-01	12:34	17-Sep-01	11:38	23.07	8	184.53	0	*0.00*	0	*0.00*
		SSL-93.2L	10U	461435	5982343	16-Sep-01	13:53	17-Sep-01	13:30	23.62	30	708.50	0	*0.00*	1	*0.14*
		SSL-90.0R	10U	464186	5982309	17-Sep-01	11:00	18-Sep-01	10:51	23.85	8	190.80	0	*0.00*	0	*0.00*
		SSL-90.2R	10U	464070	5982320	17-Sep-01	11:13	18-Sep-01	11:04	23.85	8	190.80	0	*0.00*	0	*0.00*
		SSL-90.4R	10U	463930	5982324	17-Sep-01	11:36	18-Sep-01	11:15	23.65	8	189.20	0	*0.00*	0	*0.00*
		SSL-90.6R	10U	463734	5982408	17-Sep-01	12:15	18-Sep-01	11:26	23.18	8	185.47	0	*0.00*	0	*0.00*
		SSL-90.9R	10U	463416	5982485	17-Sep-01	12:33	18-Sep-01	11:43	23.17	8	185.33	0	*0.00*	0	*0.00*
		SSL-91.5R	10U	462947	5982689	17-Sep-01	12:51	18-Sep-01	11:57	23.10	8	184.80	0	*0.00*	1	*0.54*
		SSL-92.0L	10U	462385	5982658	17-Sep-01	13:08	18-Sep-01	12:28	23.33	8	186.67	0	*0.00*	0	*0.00*
		SSL-92.4R	10U	462043	5982287	17-Sep-01	13:26	18-Sep-01	12:40	23.23	8	185.87	0	*0.00*	0	*0.00*
		SSL-93.2L	10U	461395	5982359	17-Sep-01	14:05	18-Sep-01	12:56	22.85	30	685.50	0	*0.00*	0	*0.00*
		SSL-90.6R	10U	463734	5982408	18-Sep-01	11:38	19-Sep-01	10:29	22.85	8	182.80	0	*0.00*	0	*0.00*
		SSL-90.9R	10U	463416	5982485	18-Sep-01	11:55	19-Sep-01	10:47	22.87	8	182.93	0	*0.00*	0	*0.00*
		SSL-91.5R	10U	462947	5982689	18-Sep-01	12:25	19-Sep-01	11:01	22.60	8	180.80	0	*0.00*	1	*0.55*
		SSL-92.0L	10U	462385	5982658	18-Sep-01	12:38	19-Sep-01	11:15	22.62	8	180.93	0	*0.00*	0	*0.00*

Continued…

Table B1 Summary of catch and catch rate (*CPUE* = No. caught/100 hook-hours) for white sturgeon and northern pikeminnow captured by set line in the Nechako and Fraser rivers, 2001-02.

Waterbody	Season	Station	Set location UTM (NAD 83)			Set		Pulled		Duration	No. of	Hook-	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time	(h)	Hooks	hours	Catch	*CPUE*	Catch	*CPUE*
Nechako River (Cont.)	Fall (Cont.)	SSL-92.4R	10U	462043	5982287	18-Sep-01	12:49	19-Sep-01	11:24	22.58	8	180.67	0	*0.00*	0	*0.00*
		SSL-93.2L	10U	461415	5982355	18-Sep-01	13:21	19-Sep-01	11:33	22.20	30	666.00	0	*0.00*	0	*0.00*
		SSL-96.4L	10U	458543	5982012	18-Sep-01	14:06	19-Sep-01	13:11	23.08	8	184.67	0	*0.00*	0	*0.00*
		SSL-96.5M	10U	458454	5981818	18-Sep-01	14:21	19-Sep-01	12:58	22.62	8	180.93	0	*0.00*	0	*0.00*
		SSL-98.1R	10U	457693	5980869	18-Sep-01	14:37	19-Sep-01	12:49	22.20	8	177.60	0	*0.00*	0	*0.00*
		SSL-110.0L	10U	447907	5980786	19-Sep-01	17:18	20-Sep-01	11:07	17.82	8	142.53	0	*0.00*	0	*0.00*
		SSL-110.1L	10U	447802	5980806	19-Sep-01	17:08	20-Sep-01	11:23	18.25	8	146.00	0	*0.00*	0	*0.00*
		SSL-110.2L	10U	447713	5980728	19-Sep-01	16:59	20-Sep-01	11:34	18.58	8	148.67	0	*0.00*	0	*0.00*
		SSL-111.2R	10U	447382	5979721	19-Sep-01	17:26	20-Sep-01	11:58	18.53	8	148.27	1	*0.67*	0	*0.00*
		SSL-110.0L	10U	447907	5980786	20-Sep-01	11:21	21-Sep-01	9:55	22.57	8	180.53	0	*0.00*	0	*0.00*
		SSL-110.1L	10U	447802	5980806	20-Sep-01	11:32	21-Sep-01	10:05	22.55	8	180.40	0	*0.00*	0	*0.00*
		SSL-110.2L	10U	447713	5980728	20-Sep-01	11:49	21-Sep-01	10:14	22.42	8	179.33	0	*0.00*	1	*0.56*
		SSL-111.2R	10U	447382	5979721	20-Sep-01	13:30	21-Sep-01	10:30	21.00	8	168.00	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	20-Sep-01	14:32	21-Sep-01	10:47	20.25	8	162.00	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	20-Sep-01	14:42	21-Sep-01	11:15	20.55	8	164.40	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	20-Sep-01	15:15	21-Sep-01	11:26	20.18	8	161.47	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	20-Sep-01	18:11	21-Sep-01	11:44	17.55	8	140.40	3	*2.14*	0	*0.00*
		SSL-110.0L	10U	447907	5980786	21-Sep-01	10:03	22-Sep-01	12:06	26.05	8	208.40	0	*0.00*	0	*0.00*
		SSL-110.1L	10U	447802	5980806	21-Sep-01	10:12	22-Sep-01	12:16	26.07	8	208.53	0	*0.00*	0	*0.00*
		SSL-110.2L	10U	447713	5980728	21-Sep-01	10:25	22-Sep-01	12:28	26.05	8	208.40	0	*0.00*	0	*0.00*
		SSL-111.2R	10U	447382	5979721	21-Sep-01	10:40	22-Sep-01	12:45	26.08	8	208.67	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	21-Sep-01	11:12	22-Sep-01	13:04	25.87	8	206.93	1	*0.48*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	21-Sep-01	11:24	22-Sep-01	14:11	26.78	8	214.27	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	21-Sep-01	11:38	22-Sep-01	14:35	26.95	8	215.60	2	*0.93*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	21-Sep-01	14:06	21-Sep-01	15:39	1.55	8	12.40	1	*8.06*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	21-Sep-01	16:39	22-Sep-01	16:20	23.68	8	189.47	0	*0.00*	0	*0.00*
		SSL-110.0L	10U	447907	5980786	22-Sep-01	12:15	23-Sep-01	9:54	21.65	8	173.20	0	*0.00*	0	*0.00*
		SSL-110.1L	10U	447802	5980806	22-Sep-01	12:27	23-Sep-01	10:05	21.63	8	173.07	0	*0.00*	0	*0.00*
		SSL-110.2L	10U	447713	5980728	22-Sep-01	12:38	23-Sep-01	10:14	21.60	8	172.80	0	*0.00*	0	*0.00*
		SSL-111.2R	10U	447382	5979721	22-Sep-01	12:54	23-Sep-01	10:33	21.65	8	173.20	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	22-Sep-01	14:09	23-Sep-01	10:50	20.68	8	165.47	1	*0.60*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	22-Sep-01	14:23	23-Sep-01	13:45	23.37	8	186.93	1	*0.53*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	22-Sep-01	16:17	23-Sep-01	14:04	21.78	8	174.27	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	22-Sep-01	16:33	23-Sep-01	14:25	21.87	8	174.93	1	*0.57*	0	*0.00*
		SSL-110.2L	10U	447713	5980728	23-Sep-01	10:25	24-Sep-01	10:00	23.58	8	188.67	0	*0.00*	0	*0.00*
		SSL-111.2R	10U	447382	5979721	23-Sep-01	10:44	24-Sep-01	10:19	23.58	8	188.67	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	23-Sep-01	13:43	24-Sep-01	10:36	20.88	8	167.07	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	23-Sep-01	14:00	24-Sep-01	10:49	20.82	8	166.53	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	23-Sep-01	14:22	24-Sep-01	11:03	20.68	8	165.47	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	23-Sep-01	15:14	24-Sep-01	11:26	20.20	8	161.60	1	*0.62*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	23-Sep-01	17:30	24-Sep-01	13:06	19.60	8	156.80	4	*2.55*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	23-Sep-01	15:46	24-Sep-01	16:03	24.28	8	194.27	2	*1.03*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	24-Sep-01	10:47	25-Sep-01	10:35	23.80	8	190.40	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	24-Sep-01	11:01	25-Sep-01	10:50	23.82	8	190.53	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	24-Sep-01	11:23	25-Sep-01	11:00	23.62	8	188.93	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	24-Sep-01	12:32	25-Sep-01	11:15	22.72	8	181.73	2	*1.10*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	24-Sep-01	12:51	25-Sep-01	13:00	24.15	8	193.20	2	*1.04*	0	*0.00*

Continued…

Table B1 Summary of catch and catch rate (*CPUE* = No. caught/100 hook-hours) for white sturgeon and northern pikeminnow captured by set line in the Nechako and Fraser rivers, 2001-02.

Waterbody	Season	Station	Set location UTM (NAD 83)			Set		Pulled		Duration	No. of	Hook-	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time	(h)	Hooks	hours	Catch	*CPUE*	Catch	*CPUE*
Nechako River (Cont.)	Fall (Cont.)	SSL-124.7R	10U	439657	5984759	24-Sep-01	16:01	25-Sep-01	15:07	23.10	8	184.80	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	24-Sep-01	17:53	25-Sep-01	15:17	21.40	8	171.20	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	24-Sep-01	18:04	25-Sep-01	15:31	21.45	8	171.60	1	*0.58*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	25-Sep-01	10:45	26-Sep-01	10:00	23.25	8	186.00	2	*1.08*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	25-Sep-01	10:55	26-Sep-01	12:29	25.57	8	204.53	1	*0.49*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	25-Sep-01	11:08	26-Sep-01	12:36	25.47	8	203.73	1	*0.49*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	25-Sep-01	12:50	26-Sep-01	12:46	23.93	8	191.47	0	*0.00*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	25-Sep-01	14:55	26-Sep-01	12:53	21.97	8	175.73	2	*1.14*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	25-Sep-01	15:15	26-Sep-01	13:47	22.53	8	180.27	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	25-Sep-01	15:28	26-Sep-01	13:54	22.43	8	179.47	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	25-Sep-01	16:15	26-Sep-01	14:00	21.75	8	174.00	1	*0.57*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	27-Sep-01	13:09	28-Sep-01	10:33	21.40	8	171.20	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	27-Sep-01	13:17	28-Sep-01	10:46	21.48	8	171.87	0	*0.00*	1	*0.58*
		SSL-115.2R	10U	444652	5982442	27-Sep-01	13:26	28-Sep-01	10:47	21.35	8	170.80	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	27-Sep-01	17:02	28-Sep-01	11:13	18.18	8	145.47	1	*0.69*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	27-Sep-01	12:48	28-Sep-01	12:33	23.75	8	190.00	2	*1.05*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	27-Sep-01	10:12	28-Sep-01	15:36	29.40	8	235.20	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	27-Sep-01	10:00	28-Sep-01	15:04	29.07	8	232.53	1	*0.43*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	27-Sep-01	9:54	28-Sep-01	13:56	28.03	8	224.27	3	*1.34*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	28-Sep-01	10:44	29-Sep-01	9:54	23.17	8	185.33	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	28-Sep-01	10:56	29-Sep-01	10:07	23.18	8	185.47	1	*0.54*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	28-Sep-01	11:09	29-Sep-01	11:05	23.93	8	191.47	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	28-Sep-01	12:28	29-Sep-01	11:19	22.85	8	182.80	0	*0.00*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	28-Sep-01	13:43	29-Sep-01	11:41	21.97	8	175.73	1	*0.57*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	28-Sep-01	17:00	29-Sep-01	12:59	19.98	8	159.87	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	28-Sep-01	15:32	29-Sep-01	12:19	20.78	8	166.27	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	28-Sep-01	15:02	29-Sep-01	12:08	21.10	8	168.80	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	29-Sep-01	10:05	30-Sep-01	9:46	23.68	8	189.47	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	29-Sep-01	11:02	30-Sep-01	9:58	22.93	8	183.47	1	*0.55*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	29-Sep-01	11:16	30-Sep-01	10:40	23.40	8	187.20	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	29-Sep-01	11:35	30-Sep-01	11:00	23.42	8	187.33	1	*0.53*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	29-Sep-01	11:54	30-Sep-01	11:20	23.43	8	187.47	1	*0.53*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	29-Sep-01	13:10	30-Sep-01	12:20	23.17	7	162.17	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	29-Sep-01	12:55	30-Sep-01	12:35	23.67	8	189.33	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	29-Sep-01	12:17	30-Sep-01	12:45	24.47	8	195.73	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	30-Sep-01	9:56	1-Oct-01	10:50	24.90	8	199.20	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	30-Sep-01	10:35	1-Oct-01	11:05	24.50	8	196.00	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	30-Sep-01	10:50	1-Oct-01	11:15	24.42	8	195.33	1	*0.51*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	30-Sep-01	11:18	1-Oct-01	12:40	25.37	8	202.93	1	*0.49*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	30-Sep-01	12:00	1-Oct-01	13:45	25.75	8	206.00	1	*0.49*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	30-Sep-01	12:33	1-Oct-01	15:03	26.50	7	185.50	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	30-Sep-01	12:40	1-Oct-01	15:10	26.50	8	212.00	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	30-Sep-01	12:50	1-Oct-01	15:20	26.50	8	212.00	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	1-Oct-01	11:00	2-Oct-01	10:25	23.42	8	187.33	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	1-Oct-01	11:13	2-Oct-01	10:40	23.45	8	187.60	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	1-Oct-01	12:35	2-Oct-01	10:53	22.30	8	178.40	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	1-Oct-01	13:15	2-Oct-01	11:05	21.83	8	174.67	1	*0.57*	0	*0.00*

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Table B1 Summary of catch and catch rate (*CPUE* = No. caught/100 hook-hours) for white sturgeon and northern pikeminnow captured by set line in the Nechako and Fraser rivers, 2001-02.

Waterbody	Season	Station	Set location UTM (NAD 83)			Set		Pulled		Duration	No. of	Hook-	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time	(h)	Hooks	hours	Catch	*CPUE*	Catch	*CPUE*
Nechako River (Cont.)	Fall (Cont.)	SSL-116.8L	10U	446052	5982513	1-Oct-01	14:30	2-Oct-01	11:57	21.45	8	171.60	0	*0.00*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	1-Oct-01	15:02	2-Oct-01	12:23	21.35	8	170.80	1	*0.59*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	1-Oct-01	15:15	2-Oct-01	13:31	22.27	8	178.13	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	1-Oct-01	15:30	2-Oct-01	13:42	22.20	8	177.60	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	2-Oct-01	10:37	3-Oct-01	9:30	22.88	8	183.07	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	2-Oct-01	10:51	3-Oct-01	9:40	22.82	8	182.53	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	2-Oct-01	11:02	3-Oct-01	9:50	22.80	8	182.40	1	*0.55*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	2-Oct-01	11:52	3-Oct-01	10:20	22.47	8	179.73	0	*0.00*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	2-Oct-01	12:08	3-Oct-01	10:40	22.53	8	180.27	0	*0.00*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	2-Oct-01	13:29	3-Oct-01	11:00	21.52	8	172.13	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	2-Oct-01	13:40	3-Oct-01	11:10	21.50	8	172.00	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	2-Oct-01	13:52	3-Oct-01	11:20	21.47	7	150.27	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	3-Oct-01	10:30	4-Oct-01	10:43	24.22	8	193.73	1	*0.52*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	3-Oct-01	10:45	4-Oct-01	11:28	24.72	8	197.73	0	*0.00*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	3-Oct-01	11:05	4-Oct-01	11:54	24.82	8	198.53	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	3-Oct-01	11:22	4-Oct-01	12:06	24.73	8	197.87	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	3-Oct-01	11:30	4-Oct-01	12:19	24.82	8	198.53	0	*0.00*	0	*0.00*
		SSL-129.6L	10U	391695	5972086	3-Oct-01	12:20	4-Oct-01	13:01	24.68	8	197.47	0	*0.00*	0	*0.00*
		SSL-129.9L	10U	436373	5987071	3-Oct-01	12:35	4-Oct-01	13:15	24.67	8	197.33	0	*0.00*	0	*0.00*
		SSL-131.8R	10U	435905	5985089	3-Oct-01	12:55	4-Oct-01	13:30	24.58	8	196.67	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	4-Oct-01	11:25	5-Oct-01	10:17	22.87	8	182.93	0	*0.00*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	4-Oct-01	11:38	5-Oct-01	10:31	22.88	8	183.07	1	*0.55*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	4-Oct-01	12:04	5-Oct-01	11:37	23.55	8	188.40	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	4-Oct-01	12:17	5-Oct-01	11:50	23.55	8	188.40	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	4-Oct-01	12:54	5-Oct-01	12:00	23.10	8	184.80	0	*0.00*	0	*0.00*
		SSL-129.6L	10U	391567	5975052	4-Oct-01	13:13	5-Oct-01	12:13	23.00	8	184.00	0	*0.00*	0	*0.00*
		SSL-129.9L	10U	436373	5987071	4-Oct-01	13:24	5-Oct-01	12:23	22.98	8	183.87	0	*0.00*	0	*0.00*
		SSL-131.8R	10U	435905	5985089	4-Oct-01	13:39	5-Oct-01	12:50	23.18	8	185.47	0	*0.00*	0	*0.00*
		SSL-66.2L	10U	482430	5982101	11-Oct-01	14:37	12-Oct-01	10:17	19.67	8	157.33	0	*0.00*	0	*0.00*
		SSL-66.3L	10U	482376	5982141	11-Oct-01	14:46	12-Oct-01	10:32	19.77	8	158.13	0	*0.00*	0	*0.00*
		SSL-67.0R	10U	481839	5982069	11-Oct-01	15:01	12-Oct-01	10:44	19.72	8	157.73	0	*0.00*	0	*0.00*
		SSL-68.3R	10U	480581	5981565	11-Oct-01	15:20	12-Oct-01	10:56	19.60	8	156.80	1	*0.64*	0	*0.00*
		SSL-72.5L	10U	477518	5980403	11-Oct-01	15:55	12-Oct-01	12:14	20.32	8	162.53	0	*0.00*	0	*0.00*
		SSL-74.9R	10U	475244	5979937	11-Oct-01	16:09	12-Oct-01	12:24	20.25	8	162.00	0	*0.00*	0	*0.00*
		SSL-76.1L	10U	474288	5980431	11-Oct-01	16:24	12-Oct-01	12:34	20.17	8	161.33	0	*0.00*	0	*0.00*
		SSL-78.9L	10U	471804	5981559	11-Oct-01	16:40	12-Oct-01	12:46	20.10	8	160.80	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	12-Oct-01	17:10	13-Oct-01	14:05	20.92	8	167.33	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	12-Oct-01	17:01	13-Oct-01	13:53	20.87	8	166.93	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	12-Oct-01	16:51	13-Oct-01	13:44	20.88	8	167.07	0	*0.00*	0	*0.00*
		SSL-116.2L	10U	445630	5982219	12-Oct-01	16:32	13-Oct-01	12:17	19.75	8	158.00	2	*1.27*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	12-Oct-01	16:22	13-Oct-01	12:03	19.68	8	157.47	0	*0.00*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	12-Oct-01	16:07	13-Oct-01	9:53	17.77	8	142.13	2	*1.41*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	12-Oct-01	15:58	13-Oct-01	9:42	17.73	8	141.87	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	12-Oct-01	15:50	13-Oct-01	9:30	17.67	8	141.33	0	*0.00*	0	*0.00*
		SSL-114.9R	10U	444508	5982157	13-Oct-01	14:14	14-Oct-01	9:57	19.72	7	138.02	0	*0.00*	0	*0.00*
		SSL-115.1R	10U	444533	5982307	13-Oct-01	14:03	14-Oct-01	10:05	20.03	8	160.27	0	*0.00*	0	*0.00*
		SSL-115.2R	10U	444652	5982442	13-Oct-01	13:50	14-Oct-01	10:14	20.40	8	163.20	0	*0.00*	0	*0.00*

Continued…

Table B1 Summary of catch and catch rate (*CPUE* = No. caught/100 hook-hours) for white sturgeon and northern pikeminnow captured by set line in the Nechako and Fraser rivers, 2001-02.

Waterbody	Season	Station	Set location UTM (NAD 83)			Set		Pulled		Duration	No. of	Hook-	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time	(h)	Hooks	hours	Catch	*CPUE*	Catch	*CPUE*
Nechako River (Cont.)	Fall (Cont.)	SSL-116.2L	10U	445630	5982219	13-Oct-01	13:40	14-Oct-01	10:22	20.70	8	165.60	0	*0.00*	0	*0.00*
		SSL-116.8L	10U	446052	5982513	13-Oct-01	12:15	14-Oct-01	10:34	22.32	8	178.53	0	*0.00*	0	*0.00*
		SSL-124.7R	10U	439657	5984759	13-Oct-01	11:47	14-Oct-01	11:24	23.62	8	188.93	0	*0.00*	0	*0.00*
		SSL-125.1L	10U	439876	5985109	13-Oct-01	9:50	14-Oct-01	11:34	25.73	8	205.87	0	*0.00*	0	*0.00*
		SSL-125.2L	10U	439842	5985255	13-Oct-01	9:40	14-Oct-01	11:42	26.03	8	208.27	0	*0.00*	0	*0.00*
	Total Fall 2001											**36626.52**	**57**	***0.16***	**7**	***0.02***
Nechako River	Summer	SSL-98.0R	10U	457775	5980893	10-Jul-02	15:54	11-Jul-02	10:33	18.65	16	298.40	0	*0.00*	0	*0.00*
		SSL-90.0R	10U	464367	5982288	11-Jul-02	13:03	11-Jul-02	14:13	1.17	8	9.33	0	*0.00*	0	*0.00*
		SSL-90.1R	10U	464261	5982306	11-Jul-02	13:20	12-Jul-02	12:48	23.47	8	187.73	0	*0.00*	0	*0.00*
		SSL-90.2R	10U	464180	5982299	11-Jul-02	14:30	12-Jul-02	12:57	22.45	8	179.60	0	*0.00*	0	*0.00*
		SSL-88.7L	10U	465221	5982635	12-Jul-02	14:46	13-Jul-02	11:57	21.18	8	169.47	2	*1.18*	0	*0.00*
		SSL90.1R	10U	464208	5982306	12-Jul-02	14:56	13-Jul-02	11:47	20.85	8	166.80	0	*0.00*	0	*0.00*
		SSL90.2R	10U	464108	5982312	12-Jul-02	15:04	13-Jul-02	11:39	20.58	8	164.67	0	*0.00*	0	*0.00*
		SSL90.3L	10U	464043	5982375	12-Jul-02	13:57	13-Jul-02	10:44	20.78	8	166.27	1	*0.60*	0	*0.00*
		SSL90.3R	10U	464003	5982325	12-Jul-02	15:11	13-Jul-02	11:29	20.30	8	162.40	0	*0.00*	0	*0.00*
		SSL88.6L	10U	465289	5982677	13-Jul-02	16:42	14-Jul-02	10:46	18.07	8	144.53	0	*0.00*	0	*0.00*
		SSL89.2L	10U	464951	5982298	13-Jul-02	16:31	14-Jul-02	11:35	19.07	8	152.53	0	*0.00*	0	*0.00*
		SSL89.5R	10U	464624	5982134	13-Jul-02	13:42	14-Jul-02	11:47	22.08	8	176.67	0	*0.00*	0	*0.00*
		SSL90.0R	10U	464334	5982298	13-Jul-02	13:59	14-Jul-02	11:53	21.90	8	175.20	0	*0.00*	0	*0.00*
		SSL90.1R	10U	464192	5982305	13-Jul-02	14:48	14-Jul-02	12:02	21.23	8	169.87	0	*0.00*	0	*0.00*
		SSL90.2R	10U	464124	5982310	13-Jul-02	16:05	14-Jul-02	12:09	20.07	8	160.53	0	*0.00*	0	*0.00*
		SSL90.3L	10U	463997	5982404	13-Jul-02	16:18	14-Jul-02	12:29	20.18	8	161.47	1	*0.62*	0	*0.00*
		SSL90.3R	10U	463994	5982324	13-Jul-02	16:12	14-Jul-02	12:19	20.12	8	160.93	0	*0.00*	0	*0.00*
	Total Summer 2002											**2806.40**	**4**	***0.14***	**0**	***0.00***
Total Nechako River 2001-02												**39432.92**	**61**	***0.15***	**7**	***0.02***
Fraser River	Summer	SSL777.0R	10U	517592	5961321	23-Jul-02	15:15	24-Jul-02	10:50	19.58	8	156.67	0	*0.00*	0	*0.00*
		SSL777.1R	10U	517558	5961410	23-Jul-02	14:58	24-Jul-02	11:05	20.12	8	160.93	0	*0.00*	0	*0.00*
		SSL777.6R	10U	517428	5961652	23-Jul-02	20:15	24-Jul-02	11:13	14.97	8	119.73	0	*0.00*	0	*0.00*
		SSL777.6R	10U	517395	5961709	23-Jul-02	15:35	23-Jul-02	20:06	4.52	8	36.13	0	*0.00*	0	*0.00*
		SSL778.0R	10U	517325	5962279	23-Jul-02	20:25	24-Jul-02	11:23	14.97	8	119.73	0	*0.00*	0	*0.00*
		SSL778.8R	10U	517575	5963025	24-Jul-02	12:27	25-Jul-02	10:20	21.88	8	175.07	0	*0.00*	0	*0.00*
		SSL778.9R	10U	517632	5963126	24-Jul-02	12:11	25-Jul-02	10:30	22.32	8	178.53	0	*0.00*	0	*0.00*
		SSL779.1R	10U	517573	5962317	24-Jul-02	14:00	25-Jul-02	10:40	20.67	5	103.33	0	*0.00*	0	*0.00*
		SSL779.2L	10U	517874	5963336	24-Jul-02	13:34	25-Jul-02	10:48	21.23	8	169.87	0	*0.00*	0	*0.00*
		SSL779.2R	10U	517730	5963439	24-Jul-02	13:27	25-Jul-02	10:56	21.48	7	150.38	0	*0.00*	0	*0.00*
		SSL779.6L	10U	517909	5963809	24-Jul-02	13:50	25-Jul-02	11:05	21.25	8	170.00	0	*0.00*	0	*0.00*
Total Fraser River 2002												**1540.38**	**0**	***0.00***	**0**	***0.00***
Total Nechako and Fraser Rivers												**40973.30**	**61**	***0.15***	**7**	***0.02***

Table B2 Summary of catch and catch rate (*CPUE* - No. caught/hook-hour) for white sturgeon and northern pikeminnow captured by angling in the Nechako and Fraser rivers, 2001-02.

Waterbody	Season	Station	Set Location UTM (NAD 83)			Set		Pull		Duration	No. of	Hook-	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time	(h)	Hooks	hours	Catch	*CPUE*	Catch	*CPUE*
Nechako River	Fall	AB-72.6M	10U	477322	5980354	13-Sep-01	13:23	13-Sep-01	14:31	1.13	1	1.13	0	*0.00*	0	*0.00*
		AB-72.6M	10U	477322	5980354	13-Sep-01	13:36	13-Sep-01	14:32	0.93	1	0.93	0	*0.00*	0	*0.00*
		AB-72.6M	10U	477322	5980354	13-Sep-01	13:42	13-Sep-01	14:33	0.85	1	0.85	0	*0.00*	0	*0.00*
		AB-90.2R	10U	464071	5982324	14-Sep-01	16:09	14-Sep-01	17:14	1.08	1	1.08	0	*0.00*	0	*0.00*
		AB-90.2R	10U	464071	5982324	14-Sep-01	16:12	14-Sep-01	17:20	1.13	1	1.13	0	*0.00*	0	*0.00*
		AB-90.2R	10U	464071	5982324	14-Sep-01	16:14	14-Sep-01	17:14	1.00	1	1.00	0	*0.00*	0	*0.00*
		AB-91.5M	10U	462988	5982731	16-Sep-01	15:34	16-Sep-01	16:34	1.00	1	1.00	0	*0.00*	0	*0.00*
		AB-91.5M	10U	462988	5982731	16-Sep-01	15:34	16-Sep-01	16:34	1.00	1	1.00	0	*0.00*	0	*0.00*
		AB-92.4M	10U	462103	5982379	16-Sep-01	14:10	16-Sep-01	15:24	1.23	1	1.23	0	*0.00*	0	*0.00*
		AB-92.4M	10U	462103	5982379	16-Sep-01	14:16	16-Sep-01	15:24	1.13	1	1.13	0	*0.00*	0	*0.00*
		AB-92.3M	10U	462130	5982448	17-Sep-01	14:29	17-Sep-01	16:21	1.87	1	1.87	0	*0.00*	1	*0.54*
		AB-92.3M	10U	462130	5982448	17-Sep-01	14:30	17-Sep-01	16:21	1.85	1	1.85	0	*0.00*	0	*0.00*
		AB-92.3M	10U	462130	5982448	17-Sep-01	14:33	17-Sep-01	16:21	1.80	1	1.80	0	*0.00*	0	*0.00*
		AB-90.2R	10U	464084	5982311	18-Sep-01	15:23	18-Sep-01	16:55	1.53	1	1.53	0	*0.00*	0	*0.00*
		AB-90.2R	10U	464084	5982311	18-Sep-01	15:25	18-Sep-01	16:55	1.50	1	1.50	0	*0.00*	0	*0.00*
		AB-90.2R	10U	464084	5982311	18-Sep-01	15:25	18-Sep-01	16:55	1.50	1	1.50	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445614	5982266	20-Sep-01	15:42	20-Sep-01	16:28	0.77	1	0.77	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445614	5982266	20-Sep-01	15:44	20-Sep-01	16:28	0.73	1	0.73	1	*1.36*	1	*1.36*
		AB-116-8L	10U	446049	5982570	21-Sep-01	14:26	21-Sep-01	15:33	1.12	1	1.12	0	*0.00*	0	*0.00*
		AB-116-8L	10U	446049	5982570	21-Sep-01	14:28	21-Sep-01	15:33	1.08	1	1.08	0	*0.00*	0	*0.00*
		AB-116-8L	10U	446049	5982570	21-Sep-01	14:30	21-Sep-01	15:33	1.05	1	1.05	0	*0.00*	0	*0.00*
		AB-124.7R	10U	439657	5984759	23-Sep-01	16:14	23-Sep-01	16:45	0.52	1	0.52	0	*0.00*	0	*0.00*
		AB-124.7R	10U	439657	5984759	23-Sep-01	16:05	23-Sep-01	16:45	0.67	1	0.67	1	*1.50*	0	*0.00*
		AB-124.7R	10U	439657	5984759	23-Sep-01	16:22	23-Sep-01	16:40	0.30	1	0.30	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445610	5982266	27-Sep-01	13:42	27-Sep-01	14:24	0.70	1	0.70	1	*1.43*	0	*0.00*
		AB-116.2M	10U	445610	5982266	27-Sep-01	13:41	27-Sep-01	14:24	0.72	1	0.72	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445610	5982266	27-Sep-01	14:00	27-Sep-01	14:24	0.40	1	0.40	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445610	5982266	27-Sep-01	15:16	27-Sep-01	16:47	1.52	1	1.52	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445610	5982266	27-Sep-01	15:19	27-Sep-01	16:47	1.47	1	1.47	0	*0.00*	0	*0.00*
		AB-116.2M	10U	445610	5982266	27-Sep-01	15:22	27-Sep-01	16:22	1.00	1	1.00	0	*0.00*	1	*1.00*
		AB-124.7R	10U	439657	5984759	28-Sep-01	15:52	28-Sep-01	16:47	0.92	1	0.92	0	*0.00*	0	*0.00*
		AB-124.7R	10U	439657	5984759	28-Sep-01	15:55	28-Sep-01	16:47	0.87	1	0.87	0	*0.00*	0	*0.00*
		AB-124.7R	10U	439657	5984759	28-Sep-01	15:56	28-Sep-01	16:47	0.85	1	0.85	0	*0.00*	0	*0.00*
		AB-124.6M	10U	439707	5984667	29-Sep-01	13:25	29-Sep-01	14:28	1.05	1	1.05	0	*0.00*	0	*0.00*
		AB-124.6M	10U	439707	5984667	29-Sep-01	13:30	29-Sep-01	14:28	0.97	1	0.97	0	*0.00*	0	*0.00*
		AB-124.6M	10U	439707	5984667	29-Sep-01	13:26	29-Sep-01	14:28	1.03	1	1.03	0	*0.00*	0	*0.00*
		AB-116.6L	10U	445887	5982270	30-Sep-01	15:10	30-Sep-01	16:14	1.07	1	1.07	0	*0.00*	0	*0.00*
		AB-116.6L	10U	445887	5982270	30-Sep-01	15:10	30-Sep-01	16:14	1.07	1	1.07	0	*0.00*	1	*0.94*
		AB-116.6L	10U	445887	5982270	30-Sep-01	15:10	30-Sep-01	16:14	1.07	1	1.07	0	*0.00*	0	*0.00*
		AB-117.0M	10U	446041	5982762	30-Sep-01	16:39	30-Sep-01	17:39	1.00	1	1.00	0	*0.00*	0	*0.00*
		AB-117.0M	10U	446041	5982762	30-Sep-01	16:39	30-Sep-01	17:39	1.00	1	1.00	0	*0.00*	1	*1.00*
		AB-117.0M	10U	446041	5982762	30-Sep-01	16:39	30-Sep-01	17:39	1.00	1	1.00	0	*0.00*	1	*1.00*
		AB-124.9M	10U	439788	5984929	30-Sep-01	13:15	30-Sep-01	14:46	1.52	1	1.52	0	*0.00*	0	*0.00*
		AB-124.9M	10U	439788	5984929	30-Sep-01	13:19	30-Sep-01	14:46	1.45	1	1.45	0	*0.00*	0	*0.00*
		AB-124.9M	10U	439788	5984929	30-Sep-01	13:25	30-Sep-01	14:46	1.35	1	1.35	0	*0.00*	0	*0.00*

Continued…

Table B2 (Concluded)

Waterbody	Season	Station	Set Location UTM (NAD 83)			Set		Pull		Duration (h)	No. of Hooks	Hook-hours	White Sturgeon		Northern Pikeminnow	
			Zone	Easting	Northing	Date	Time	Date	Time				Catch	*CPUE*	Catch	*CPUE*
Nechako River (Cont.)	Fall (Cont.)	AB-117.0L	10U	446044	5982757	3-Oct-01	14:30	3-Oct-01	16:15	1.75	1	1.75	0	*0.00*	0	*0.00*
		AB-117.0L	10U	446044	5982757	3-Oct-01	14:30	3-Oct-01	16:15	1.75	1	1.75	0	*0.00*	0	*0.00*
		AB-117.0L	10U	446044	5982757	3-Oct-01	14:43	3-Oct-01	16:15	1.53	1	1.53	0	*0.00*	0	*0.00*
		AB-131.4R	10U	436490	5985397	3-Oct-01	13:15	3-Oct-01	13:45	0.50	1	0.50	0	*0.00*	0	*0.00*
		AB-131.4R	10U	436490	5985397	3-Oct-01	13:25	3-Oct-01	13:45	0.33	1	0.33	0	*0.00*	0	*0.00*
		AB-131.4R	10U	436490	5985397	3-Oct-01	13:25	3-Oct-01	13:46	0.35	1	0.35	0	*0.00*	0	*0.00*
	Total Fall 2001											**55.00**	**3**	***0.05***	**6**	***0.11***
Nechako River Fraser River	Summer	AB-90.0R	10U	464128	5982383	11-Jul-02	12:29	11-Jul-02	12:58	0.48	1	0.48	0	*0.00*	0	*0.00*
	Summer	AB-777.0R	10U	517628	5961262	23-Jul-02	14:15	23-Jul-02	14:44	0.48	1	0.48	0	*0.00*	0	*0.00*
		AB-777.0R	10U	517669	5961172	23-Jul-02	14:17	23-Jul-02	14:43	0.43	1	0.43	0	*0.00*	0	*0.00*
		AB-777.0R	10U	517645	5961221	23-Jul-02	14:18	23-Jul-02	14:45	0.45	1	0.45	0	*0.00*	0	*0.00*
	Total Summer 2002											**1.85**	**0**	***0.00***	**0**	***0.00***
Total Effort All Seasons												**56.85**	**3**	***0.05***	**6**	***0.11***

Table B3 Summary of tangle net catch and catch-per-unit-effort (*CPUE* = No. of fish/net-day by mesh size) in the Nechako River, 2001-02.

Waterbody	Season	Station (km)	Set		Pulled		Duration (h)	Mesh Size (mm)	Net Area (m^2)	Net-Day [1]	White Sturgeon	
			Date	Time	Date	Time					Catch	*CPUE*
Nechako River	Fall	TN-110.2M	2-Oct-01	14:59	2-Oct-01	15:44	0.75	228.6	46.5	0.01	0	*0.00*
		TN-110.2M	2-Oct-01	15:49	2-Oct-01	16:45	0.93	228.6	46.5	0.02	0	*0.00*
		TN-117.0L	4-Oct-01	15:00	4-Oct-01	16:01	1.02	228.6	46.5	0.02	0	*0.00*
	Total Fall 2001									**0.05**	**0**	***0.00***
	Summer	TN-90.1M	11-Jul-02	14:22	11-Jul-02	15:45	1.38	203.2	46.5	0.03	0	*0.00*
		TN-90.2M	11-Jul-02	14:48	11-Jul-02	16:00	1.20	203.2	46.5	0.02	0	*0.00*
		TN-90.3M	12-Jul-02	12:44	12-Jul-02	14:05	1.35	127.0	46.5	0.03	0	*0.00*
								215.9	46.5	0.03	0	*0.00*
		TN-90.3M	12-Jul-02	12:08	12-Jul-02	12:38	0.50	127.0	46.5	0.01	0	*0.00*
								215.9	46.5	0.01	0	*0.00*
		TN-90.1R	13-Jul-02	14:06	13-Jul-02	15:21	1.25	127.0	46.5	0.02	0	*0.00*
								215.9	46.5	0.02	0	*0.00*
		TN-90.1M	13-Jul-02	14:24	13-Jul-02	15:37	1.22	127.0	46.5	0.02	0	*0.00*
								215.9	46.5	0.02	0	*0.00*
		TN-89.7M	13-Jul-02	15:30	13-Jul-02	16:47	1.28	127.0	46.5	0.02	0	*0.00*
								215.9	46.5	0.02	0	*0.00*
	Total Summer 2002									**0.27**	**0**	***0.00***
Total Effort All Seasons										**0.32**	**0**	***0.00***

[1] One net-day = 100 m² of net set for a 24 hour period.

Table B4 Summary of catch rate for white sturgeon and non-white sturgeon eggs or larva sampled by egg collection mats in the Stuart and Nechako Rivers, 2002.

Water Body	Station (km)	No. Mats	Mat Area (m^2)	Set		Pulled		Duration (h)	WST Egg	Non-WST Egg	Catch	*CPUE* (egg/100h)	*CPUE* (egg/m^2/24h)
				Date	Time	Date	Time						
Stuart R.	SMST0.2R	1	0.70	6-Jul	12:03	8-Jul	15:15	51.20	0	0	**0**	***0.00***	***0.00***
		1	0.70	8-Jul	15:44	11-Jul	11:38	67.90	0	0	**0**	***0.00***	***0.00***
	SMST0.5R	1	0.70	6-Jul	12:09	10-Jul	14:25	98.27	0	0	**0**	***0.00***	***0.00***
	SMST1.2L	1	0.70	6-Jul	12:18	10-Jul	13:53	97.58	0	0	**0**	***0.00***	***0.00***
	SMST1.3M	1	0.70	6-Jul	12:59	10-Jul	14:23	97.40	0	0	**0**	***0.00***	***0.00***
	SMST1.6L	1	0.70	6-Jul	12:27	10-Jul	13:01	96.57	0	0	**0**	***0.00***	***0.00***
	SMST2.3R	2	1.16	6-Jul	12:36	10-Jul	12:30	95.90	0	0	**0**	***0.00***	***0.00***
	SMST2.5R	1	0.58	6-Jul	12:46	10-Jul	12:08	95.37	0	0	**0**	***0.00***	***0.00***
Nechako R.	SM58.0L	2	1.16	14-Jun	14:53	17-Jun	13:48	70.92	0	1	**1**	***1.41***	***0.29***
		2	1.16	17-Jun	14:06	20-Jun	17:25	75.32	0	1	**1**	***1.33***	***0.27***
		2	1.16	20-Jun	17:39	23-Jun	11:12	65.55	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	11:38	26-Jun	11:08	71.50	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	11:31	1-Jul	10:19	118.80	0	0	**0**	***0.00***	***0.00***
	SM58.3M	2	1.16	13-Jun	14:08	17-Jun	13:12	95.07	0	0	**0**	***0.00***	***0.00***
	SM58.3L	2	1.16	14-Jun	14:47	17-Jun	12:54	70.12	0	0	**0**	***0.00***	***0.00***
		2	1.16	17-Jun	13:09	20-Jun	15:43	74.57	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	16:14	23-Jun	11:42	67.47	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	12:05	26-Jun	11:37	71.53	0	1	**1**	***1.40***	***0.29***
		2	1.16	26-Jun	11:58	1-Jul	10:32	118.57	0	0	**0**	***0.00***	***0.00***
	SM58.4R	2	1.16	17-Jun	13:41	20-Jun	16:42	75.02	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	12:30	26-Jun	12:03	71.55	0	1	**1**	***1.40***	***0.29***
		2	1.16	26-Jun	12:32	1-Jul	10:46	118.23	0	0	**0**	***0.00***	***0.00***
	SM58.5R	2	1.16	14-Jun	14:38	17-Jun	12:35	69.95	0	0	**0**	***0.00***	***0.00***
		2	1.16	17-Jun	12:50	20-Jun	16:17	75.45	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	17:20	23-Jun	12:15	66.92	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	16:37	23-Jun	12:33	67.93	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	13:08	26-Jun	12:37	71.48	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	13:12	1-Jul	11:10	117.97	0	0	**0**	***0.00***	***0.00***
	SM58.6R	2	1.16	13-Jun	13:52	17-Jun	12:10	94.30	0	0	**0**	***0.00***	***0.00***
	SM58.6L	2	1.16	13-Jun	14:01	17-Jun	11:04	93.05	0	0	**0**	***0.00***	***0.00***
		2	1.16	17-Jun	11:26	20-Jun	14:37	75.18	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	15:20	23-Jun	14:25	71.08	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	14:45	26-Jun	13:36	70.85	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	13:48	1-Jul	11:40	117.87	0	0	**0**	***0.00***	***0.00***
	SM58.7L	2	1.16	13-Jun	14:18	17-Jun	11:31	93.22	0	0	**0**	***0.00***	***0.00***
		2	1.16	17-Jun	12:00	20-Jun	15:24	75.40	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	15:38	23-Jun	14:53	71.25	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	15:23	26-Jun	14:50	71.45	0	0	**0**	***0.00***	***0.00***

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Table B4 Summary of catch rate for white sturgeon and non-white sturgeon eggs or larva sampled by egg collection mats in the Stuart and Nechako Rivers, 2002.

Water Body	Station (km)	No. Mats	Mat Area (m^2)	Set		Pulled		Duration (h)	WST Egg	Non-WST Egg	Catch	*CPUE* (egg/100h)	*CPUE* (egg/m^2/24h)
				Date	Time	Date	Time						
Nechako R. (Cont.)		2	1.16	26-Jun	15:12	1-Jul	11:20	116.13	0	0	**0**	***0.00***	***0.00***
		2	1.16	1-Jul	11:30	5-Jul	12:49	97.32	0	0	**0**	***0.00***	***0.00***
	SM58.7R	2	1.16	17-Jun	12:31	20-Jun	14:01	73.50	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	14:33	23-Jun	13:42	71.15	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	14:25	26-Jun	14:30	72.08	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	14:45	1-Jul	13:03	118.30	0	0	**0**	***0.00***	***0.00***
		2	1.16	1-Jul	13:31	5-Jul	12:39	95.13	0	0	**0**	***0.00***	***0.00***
	SM58.8M	2	1.16	14-Jun	15:10	17-Jun	10:41	67.52	0	0	**0**	***0.00***	***0.00***
		2	1.16	17-Jun	10:58	20-Jun	13:32	74.57	0	0	**0**	***0.00***	***0.00***
		2	1.16	20-Jun	13:57	23-Jun	13:15	71.30	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	13:42	26-Jun	13:45	72.05	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	14:23	1-Jul	12:47	118.40	0	0	**0**	***0.00***	***0.00***
		2	1.16	1-Jul	12:58	5-Jul	12:11	95.22	0	0	**0**	***0.00***	***0.00***
	SM59.9L	2	1.16	14-Jun	15:23	16-Jun	15:45	48.37	0	2	**2**	***4.14***	***0.85***
		2	1.16	16-Jun	16:05	19-Jun	17:27	73.37	0	9	**9**	***12.27***	***2.54***
		2	1.16	19-Jun	17:45	23-Jun	15:28	93.72	0	3	**3**	***3.20***	***0.66***
		2	1.16	23-Jun	15:44	26-Jun	15:15	71.52	0	6	**6**	***8.39***	***1.73***
		2	1.16	26-Jun	15:35	28-Jun	14:31	46.93	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	14:48	1-Jul	13:43	70.92	0	0	**0**	***0.00***	***0.00***
	SM60.0L	2	1.16	13-Jun	14:50	16-Jun	14:35	71.75	0	0	**0**	***0.00***	***0.00***
		2	1.16	16-Jun	15:00	19-Jun	16:31	73.52	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	16:53	23-Jun	16:03	95.17	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	16:15	26-Jun	15:58	71.72	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	16:15	28-Jun	15:08	46.88	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	15:21	1-Jul	14:15	70.90	0	0	**0**	***0.00***	***0.00***
		2	1.16	1-Jul	14:30	5-Jul	13:22	94.87	0	3	**3**	***3.16***	***0.65***
	SM60.0R	2	1.16	13-Jun	14:27	16-Jun	15:15	72.80	0	0	**0**	***0.00***	***0.00***
		2	1.16	16-Jun	15:40	19-Jun	16:57	73.28	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	17:21	23-Jun	15:49	94.47	0	1	**1**	***1.06***	***0.22***
		2	1.16	23-Jun	15:59	26-Jun	15:30	71.52	0	2	**2**	***2.80***	***0.58***
		2	1.16	26-Jun	15:50	28-Jun	14:53	47.05	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	15:05	1-Jul	13:57	70.87	0	2	**2**	***2.82***	***0.58***
		2	1.16	1-Jul	14:11	5-Jul	13:06	94.92	0	2	**2**	***2.11***	***0.44***
	SM60.3R	2	1.16	13-Jun	14:59	16-Jun	13:51	70.87	0	0	**0**	***0.00***	***0.00***
		2	1.16	16-Jun	14:28	19-Jun	16:13	73.75	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	16:26	23-Jun	16:22	95.93	0	0	**0**	***0.00***	***0.00***
		2	1.16	23-Jun	16:40	26-Jun	16:20	71.67	0	0	**0**	***0.00***	***0.00***
		2	1.16	26-Jun	16:35	28-Jun	15:26	46.85	0	0	**0**	***0.00***	***0.00***

Continued…

Table B4 Summary of catch rate for white sturgeon and non-white sturgeon eggs or larva sampled by egg collection mats in the Stuart and Nechako Rivers, 2002.

Water Body	Station (km)	No. Mats	Mat Area (m^2)	Set		Pulled		Duration (h)	WST Egg	Non-WST Egg	Catch	*CPUE* (egg/100h)	*CPUE* (egg/m^2/24h)
				Date	Time	Date	Time						
Nechako R.		2	1.16	28-Jun	15:41	1-Jul	14:34	70.88	0	1	**1**	***1.41***	***0.29***
(Cont.)		2	1.16	1-Jul	14:55	5-Jul	13:39	94.73	0	0	**0**	***0.00***	***0.00***
	SM64.5L	2	1.16	16-Jun	13:35	19-Jun	15:38	74.05	0	1	**1**	***1.35***	***0.28***
		2	1.16	19-Jun	16:01	22-Jun	12:31	68.50	0	3	**3**	***4.38***	***0.91***
		2	1.16	22-Jun	13:00	25-Jun	13:51	72.85	0	0	**0**	***0.00***	***0.00***
		2	1.16	4-Jul	14:47	7-Jul	12:17	69.50	0	0	**0**	***0.00***	***0.00***
		2	1.16	7-Jul	12:30	9-Jul	12:59	48.48	0	0	**0**	***0.00***	***0.00***
		2	1.16	25-Jun	14:18	N/A - Could not locate							
	SM64.6L	2	1.16	13-Jun	12:31	16-Jun	13:17	72.77	0	0	**0**	***0.00***	***0.00***
		2	1.16	14-Jun	14:05	16-Jun	12:27	46.37	0	0	**0**	***0.00***	***0.00***
		2	1.16	16-Jun	13:10	20-Jun	12:25	95.25	0	0	**0**	***0.00***	***0.00***
	SM64.6R	2	1.16	20-Jun	13:14	22-Jun	11:54	46.67	0	0	**0**	***0.00***	***0.00***
		2	1.16	22-Jun	12:27	25-Jun	13:23	72.93	0	0	**0**	***0.00***	***0.00***
		2	1.16	25-Jun	13:46	28-Jun	10:40	68.90	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	10:50	4-Jul	14:21	147.52	0	0	**0**	***0.00***	***0.00***
		2	1.16	4-Jul	14:40	7-Jul	11:54	69.23	0	0	**0**	***0.00***	***0.00***
		2	1.16	7-Jul	12:13	9-Jul	12:37	48.40	0	0	**0**	***0.00***	***0.00***
	SM64.7R	2	1.16	14-Jun	13:57	16-Jun	11:54	45.95	0	0	**0**	***0.00***	***0.00***
		2	1.16	16-Jun	12:22	19-Jun	15:19	74.95	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	15:32	22-Jun	11:27	67.92	0	0	**0**	***0.00***	***0.00***
		2	1.16	22-Jun	11:49	25-Jun	12:51	73.03	0	0	**0**	***0.00***	***0.00***
		2	1.16	25-Jun	13:17	28-Jun	11:00	69.72	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	11:09	4-Jul	13:56	146.78	0	0	**0**	***0.00***	***0.00***
		2	1.16	4-Jul	14:17	7-Jul	11:39	69.37	0	0	**0**	***0.00***	***0.00***
		2	1.16	7-Jul	11:50	9-Jul	12:16	48.43	0	0	**0**	***0.00***	***0.00***
	SM65.1L	2	1.16	13-Jun	12:22	16-Jun	11:25	71.05	0	0	**0**	***0.00***	***0.00***
		2	1.16	16-Jun	11:48	19-Jun	15:00	75.20	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	15:14	22-Jun	11:10	67.93	0	1	**1**	***1.47***	***0.30***
		2	1.16	22-Jun	11:22	25-Jun	12:28	73.10	0	1	**1**	***1.37***	***0.28***
		2	1.16	25-Jun	12:45	28-Jun	11:17	70.53	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	11:25	4-Jul	13:40	146.25	0	1	**1**	***0.68***	***0.14***
		2	1.16	4-Jul	13:52	7-Jul	11:18	69.43	0	4	**4**	***5.76***	***1.19***
		2	1.16	7-Jul	11:35	9-Jul	12:03	48.47	0	2	**2**	***4.13***	***0.85***
	SM65.3R	2	1.16	19-Jun	14:45	22-Jun	10:13	67.47	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	14:55	22-Jun	10:38	67.72	0	0	**0**	***0.00***	***0.00***
		2	1.16	22-Jun	10:35	25-Jun	11:31	72.93	0	0	**0**	***0.00***	***0.00***
		2	1.16	22-Jun	11:05	25-Jun	11:52	72.78	0	1	**1**	***1.37***	***0.28***
		2	1.16	25-Jun	12:22	28-Jun	11:30	71.13	0	1	**1**	***1.41***	***0.29***

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Table B4 Summary of catch rate for white sturgeon and non-white sturgeon eggs or larva sampled by egg collection mats in the Stuart and Nechako Rivers, 2002.

Water Body	Station (km)	No. Mats	Mat Area (m^2)	Set		Pulled		Duration (h)	WST Egg	Non-WST Egg	Catch	*CPUE* (egg/100h)	*CPUE* (egg/m^2/24h)
				Date	Time	Date	Time						
Nechako R. (Cont.)		2	1.16	25-Jun	11:47	28-Jun	11:51	72.07	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	12:02	4-Jul	13:07	145.08	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	11:45	4-Jul	13:22	145.62	0	0	**0**	***0.00***	***0.00***
		2	1.16	4-Jul	13:17	7-Jul	10:46	69.48	0	0	**0**	***0.00***	***0.00***
		2	1.16	4-Jul	13:34	7-Jul	11:02	69.47	0	0	**0**	***0.00***	***0.00***
		2	1.16	7-Jul	10:58	9-Jul	11:43	48.75	0	0	**0**	***0.00***	***0.00***
		2	1.16	7-Jul	11:13	9-Jul	11:53	48.67	0	0	**0**	***0.00***	***0.00***
	SM65.4M	2	1.16	13-Jun	12:05	16-Jun	10:40	70.58	0	0	**0**	***0.00***	***0.00***
	SM65.4L	2	1.16	16-Jun	11:16	19-Jun	14:20	75.07	0	0	**0**	***0.00***	***0.00***
		2	1.16	19-Jun	14:37	22-Jun	9:53	67.27	0	0	**0**	***0.00***	***0.00***
		2	1.16	22-Jun	10:08	25-Jun	11:01	72.88	0	0	**0**	***0.00***	***0.00***
		2	1.16	25-Jun	11:25	28-Jun	12:06	72.68	0	0	**0**	***0.00***	***0.00***
		2	1.16	28-Jun	12:26	4-Jul	12:41	144.25	0	0	**0**	***0.00***	***0.00***
		2	1.16	4-Jul	13:01	7-Jul	10:11	69.17	0	0	**0**	***0.00***	***0.00***
		2	1.16	7-Jul	10:36	9-Jul	11:21	48.75	0	0	**0**	***0.00***	***0.00***
	SM88.3M	1	0.70	12-Jul	15:46	14-Jul	11:23	43.62	0	0	**0**	***0.00***	***0.00***
	SM88.8R	2	1.16	12-Jul	15:51	14-Jul	11:01	43.17	0	0	**0**	***0.00***	***0.00***
	SM89.1R	2	1.16	5-Jul	17:13	8-Jul	13:52	68.65	0	0	**0**	***0.00***	***0.00***
		2	1.16	8-Jul	14:03	10-Jul	16:40	50.62	0	2	**2**	***3.95***	***0.82***
	SM89.2R	2	1.16	5-Jul	17:24	8-Jul	14:08	68.73	0	0	**0**	***0.00***	***0.00***
		2	1.16	8-Jul	14:21	10-Jul	16:55	50.57	0	0	**0**	***0.00***	***0.00***
		2	1.16	12-Jul	15:56	14-Jul	15:36	47.67	0	0	**0**	***0.00***	***0.00***
	SM89.3R	2	1.16	5-Jul	17:32	8-Jul	14:25	68.88	0	0	**0**	***0.00***	***0.00***
		2	1.16	8-Jul	14:37	10-Jul	17:04	50.45	0	0	**0**	***0.00***	***0.00***
		2	1.16	12-Jul	16:09	14-Jul	15:46	47.62	0	0	**0**	***0.00***	***0.00***
	SM89.4R	2	1.16	12-Jul	16:02	14-Jul	15:57	47.92	0	0	**0**	***0.00***	***0.00***
	SM89.6R	2	1.16	5-Jul	17:42	8-Jul	14:41	68.98	0	1	**1**	***1.45***	***0.30***
		2	1.16	8-Jul	14:52	11-Jul	11:18	68.43	0	0	**0**	***0.00***	***0.00***
	SM89.9R	2	1.16	5-Jul	17:49	8-Jul	14:58	69.15	0	0	**0**	***0.00***	***0.00***
		2	1.16	8-Jul	15:10	11-Jul	11:28	68.30	0	0	**0**	***0.00***	***0.00***
	SM103.7R	2	1.16	11-Jun	14:02	15-Jun	11:42	93.67	0	0	**0**	***0.00***	***0.00***
	SM103.8L	2	1.16	11-Jun	14:13	15-Jun	12:08	93.92	0	0	**0**	***0.00***	***0.00***
Total		**284**	**165.70**					**11131.28**	**0.00**	**53.00**	**53.00**	***0.48***	***0.00***

Table B5 Summary of catch and catch rate for white sturgeon and non-white sturgeon sampled by D-ring drift net, 2002.

Water Body	Survey Session	Station (km)	Set		Pulled		Duration (h)	Velocity[1] (m/s)	Volume[2] (m^3)	WST			Non-WST			Total Catch	*CPUE* (Catch/h)	*CPUE* (Catch/1000m^3)
			Date	Time	Date	Time				Egg	Larval	Fry	Egg	Fry	Juvenile			
Nechako	Spring	DN59.8L	26-Jun	16:50	26-Jun	17:00	0.17	0.53	79.88	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			26-Jun	17:04	26-Jun	17:14	0.17	0.53	79.88	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		DN63.3L	4-Jul	17:10	4-Jul	17:23	0.22	1.97	385.99	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		DN63.4L	7-Jul	14:05	7-Jul	14:33	0.47	1.76	742.75	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			7-Jul	14:59	7-Jul	15:27	0.47	1.76	742.75	0	0	0	0	5	1	**6**	***12.86***	***8.08***
		DN64.4L	4-Jul	15:03	4-Jul	15:17	0.23	2.55	538.07	0	0	0	0	3	0	**3**	***12.86***	***5.58***
		DN64.4M	7-Jul	12:47	7-Jul	13:11	0.40	2.30	831.97	0	0	0	0	4	0	**4**	***10.00***	***4.81***
		DN65.3L	28-Jun	13:42	28-Jun	13:57	0.25	1.98	447.64	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		DN65.4L	25-Jun	17:46	25-Jun	17:56	0.17	1.25	188.40	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			25-Jun	18:01	25-Jun	18:11	0.17	1.25	188.40	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			28-Jun	12:36	28-Jun	12:56	0.33	2.27	684.27	0	0	0	0	3	0	**3**	***9.00***	***4.38***
			29-Jun	12:56	29-Jun	13:21	0.42	2.45	923.16	0	0	0	0	0	4	**4**	***9.60***	***4.33***
			29-Jun	14:04	29-Jun	14:14	0.17	2.50	376.80	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			4-Jul	16:12	4-Jul	16:27	0.25	2.46	556.16	0	0	0	1	1	0	**2**	***8.00***	***3.60***
		DN65.5R	27-Jun	15:36	27-Jun	15:56	0.33	1.31	394.89	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			29-Jun	15:03	29-Jun	15:13	0.17	1.58	238.14	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			29-Jun	15:17	29-Jun	15:27	0.17	1.58	238.14	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		DN65.7L	25-Jun	16:24	25-Jun	16:34	0.17	1.36	204.98	0	0	0	0	1	0	**1**	***6.00***	***4.88***
			25-Jun	16:40	25-Jun	16:51	0.18	1.36	225.48	0	0	0	0	1	0	**1**	***5.45***	***4.44***
		DN89.7R	6-Jul	16:12	6-Jul	16:37	0.42	0.11	41.45	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		DN103.8M	15-Jun	12:23	15-Jun	13:10	0.78	1.47	1041.32	0	0	0	0	0	0	**0**	***0.00***	***0.00***
Total							**6.08**		**9150.51**	**0**	**0**	**0**	**1**	**18**	**5**	**24**	***3.95***	***2.62***

[1] Calculated from average surface velocity

[2] Based on D-ring drift net aperature of 0.2512 m^2

Table B6 Summary of catch and catch rate for white sturgeon and non-white sturgeon sampled by Miller drift net, 2002.

Water Body	Survey Session	Station (km)	Set		Pulled		Duration (h)	Velocity[1] (m/s)	Volume[2] (m3)	WST			Non-WST			Total Catch	*CPUE* (Catch/h)	*CPUE* (Catch/1000m3)
			Date	Time	Date	Time				Egg	Larval	Fry	Egg	Fry	Juvenile			
Stuart	Spring	MS0.2R	8-Jul	15:59	8-Jul	16:59	1.00	1.87	63.95	0	0	0	0	3	0	**3**	***3.00***	***46.91***
			8-Jul	16:24	8-Jul	17:25	1.02	1.87	65.01	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			8-Jul	16:17	8-Jul	17:17	1.00	1.87	63.95	0	0	0	0	0	0	**0**	***0.00***	***0.00***
Nechako	Spring	MS63.4L	7-Jul	14:06	7-Jul	14:53	0.78	1.76	47.15	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			7-Jul	15:01	7-Jul	16:00	0.98	1.76	59.18	0	0	0	0	1	0	**1**	***1.02***	***16.90***
		MS64.4M	7-Jul	12:50	7-Jul	13:41	0.85	2.30	66.85	0	0	0	0	1	0	**1**	***1.18***	***14.96***
		MS64.5L	9-Jul	13:44	9-Jul	14:45	1.02	1.32	45.89	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			9-Jul	13:46	9-Jul	14:49	1.05	1.32	47.40	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			9-Jul	13:48	9-Jul	14:54	1.10	1.32	49.65	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		MS64.8L	9-Jul	15:19	9-Jul	16:19	1.00	1.69	57.79	0	0	0	0	1	0	**1**	***1.00***	***17.30***
			9-Jul	15:21	9-Jul	16:25	1.07	1.69	61.64	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			9-Jul	15:23	9-Jul	16:31	1.13	1.69	65.50	0	0	0	0	1	0	**1**	***0.88***	***15.27***
		MS89.7R	6-Jul	16:56	6-Jul	17:25	0.48	1.70	28.10	0	0	0	0	0	0	**0**	***0.00***	***0.00***
		MS89.9M	6-Jul	13:58	6-Jul	14:20	0.37	1.36	17.05	0	0	0	0	0	0	**0**	***0.00***	***0.00***
			6-Jul	14:25	6-Jul	15:08	0.72	1.36	33.33	0	0	0	0	0	0	**0**	***0.00***	***0.00***
Total							**13.57**		**772.45**	**0**	**0**	**0**	**0**	**7**	**0**	**7**	***0.52***	***9.06***

[1] Calculated from average surface velocity

[2] Based on Miller drift net aperature of 0.009499 m^2

APPENDIX C

LIFE HISTORY DATA

Table C1 Capture information for white sturgeon in the study area, 2001 and 2002.

Fork Length (cm)	Total Length (cm)	Weight (kg)	Post-orbital Length (cm)	Post-opercular Length (cm)	Girth (cm)	Sex[1]	Age Method[2]	Capture Method[3]	UTM Co-ordinates			Dart/T-Anchor Tag		PIT Tag No.	Bio-sample Code[5]	Capture Date	Waterbody	Site (km)	Capture Code[6]	Comments
									Grid Zone	Easting	Northing	Colour[4]	No.							
185.0	207.5	53.9	19.5	46.0	78.0	03	FR	AB	10U	445709	5982063	Y	1500	4124766A7E	1	20-Sep-01	Nechako	116.2	0	
147.5	163.0	24.0	17.5	39.0	58.0	97		SSL	10U	439752	5984556	Y	0088	501F7A3051	0	13-Oct-01	Nechako	124.7	2	Internal RT149.700 CH20 CD6; recapture from Lheidli T'enneh program.
219.0	248.5	71.2	22.5	34.0	79.0	97		SSL	10U	446147	5982310	Y	017	7F7B0C5763	0	30-Sep-01	Nechako	116.8	2	Recapture. Missing 1 barbel.
141.5	155.5	17.3	15.5	35.0	48.5	97	FR	SSL	10U	439752	5984556	Y	1311	412466701E	1	24-Sep-01	Nechako	124.7	0	Sharp cutes. Hook damage to mouth.
175.0	196.0	42.2	21.0	45.0	68.0	14	FR	SSL	10U	444747	5982239	Y	1306	4124680C7A	1	22-Sep-01	Nechako	115.2	0	Internal RT149.700 CH20 CD6. Lateral scutes well worn down. Large dorsal scutes.
149.5	167.5	21.4	15.0	35.0	53.5	97	FR	SSL	10U	445725	5982016	Y	1301	4124684A2D	1	21-Sep-01	Nechako	116.2	0	Sharp scutes.
184.0	208.0	45.8	22.0	45.0	71.0	97	FR	SSL	10U	446147	5982310	Y	1319	4124687B73	1	25-Sep-01	Nechako	116.8	0	Small 2 cm tear in caudal.
158.5	181.5	34.0	21.5	45.0	63.5	97	FR	SSL	10U	446147	5982310	Y	1325	4124697953	1	26-Sep-01	Nechako	116.8	0	Scute D3 torn, but not removed.
228.0	254.0	95.2	24.5	57.0	88.5	04	FR	SSL	10U	446147	5982310	Y	1326	41246D0D41	1	26-Sep-01	Nechako	116.8	0	Internal RT149.700 CH 20 CD 11. Scute L6 on left side removed.
126.0	140.5	15.0	16.0	33.5	49.5	97	FR	SSL	10U	439971	5984906	Y	1315	41246D3805	1	23-Sep-01	Nechako	125.1	0	
156.0	174.0	29.0	17.5	40.0	61.0	97	FR	SSL	10U	444628	5982104	Y	1335	4124714367	1	30-Sep-01	Nechako	115.1	0	
123.5	139.5	14.0	14.5	23.5	43.5	97	FR	SSL	10U	444742	5982239	Y	1341	412472662E	1	3-Oct-01	Nechako	115.2	0	
110.0	124.0	9.1	14.0	28.5	40.5	98	FR	AB	10U	439752	5984556	Y	1309	4124734300	1	23-Sep-01	Nechako	124.7	0	Fin clip 0.5 cm low.
178.5	201.0	46.3	21.0	45.0	71.5	03		SSL	10U	445725	5982016	Y	1302	22235D2A63	0	21-Sep-01	Nechako	116.2	2	Recapture; Y004 dart lost during retrieval. 2 cm tear in caudal fin.
199.0	223.0	60.3	24.0	51.0	76.0	04	FR	SSL	10U	446147	5982310	Y	1320	4124741829	1	25-Sep-01	Nechako	116.8	0	Internal RT 149.700 CH20 CD9. Slight irregularities in pectoral fins. Fin clip 0.5 cm back. Milky fluid observed by Albert in stretcher.
138.5	156.0	19.5	17.0	36.5	53.5	97	FR	SSL	10U	445725	5982016	Y	1310	41247A086B	1	24-Sep-01	Nechako	116.2	0	Sharp scutes. One lateral scute on right side damaged. Small scars on left side.
187.0	213.0	50.8	23.0	50.5	73.0	03	FR	SSL	10U	444603	5981954	Y	1323	41247A221A	1	26-Sep-01	Nechako	114.9	0	
164.5	187.5	31.3	17.5	38.5	60.0	03	FR	SSL	10U	445725	5982016	Y	1318	41247A5430	1	25-Sep-01	Nechako	116.2	0	
188.0	211.5	49.0	22.5	50.0	73.0	03	FR	SSL	10U	445725	5982016	Y	1303	41247B7427	1	21-Sep-01	Nechako	116.2	0	Brownish color. Scutes D3,4,5 are torn but not removed.
188.0	212.0	55.3	23.0	49.0	76.0	04	FR	SSL	10U	446147	5982310	Y	1338	41247C4F74	1	1-Oct-01	Nechako	116.8	0	Internal RT149.700 CH20 CD2.
155.5	173.5	25.9	19.0	41.0	58.0	03	FR	SSL	10U	444603	5981954	Y	1304	41247D0448	1	22-Sep-01	Nechako	114.9	0	Small tears in caudal and left pelvic fins.
145.5	166.5	20.9	17.0	38.5	55.5	97	FR	SSL	10U	445725	5982016	Y	1339	412500497F	1	2-Oct-01	Nechako	116.2	0	Anomaly on left pectoral fin.
		>12				98		SSL	10U	439937	5985052	Y	1125	4125034473	0	26-Sep-01	Nechako	125.2	2	Recapture from Fraser R. Km 760. No additional data due to boat problems - not a candidate for tags - not tethered - could entangle on LWD.
151.5	169.0	26.3	16.0	37.5	59.0	97	FR	SSL	10U	446147	5982310	Y	1329	412504440C	1	28-Sep-01	Nechako	116.8	0	
172.0	196.0	39.0	20.5	45.0	72.5	02	FR	SSL	10U	439752	5984556	Y	1314	41250B2C18	1	24-Sep-01	Nechako	124.7	0	
234.0	258.0	87.5	26.0	55.5	81.0	04	FR	SSL	10U	444742	5982239	Y	1337	41250F0A39	1	1-Oct-01	Nechako	115.2	0	Internal RT149.700 CH20 CD 12. Slight atrophy on fins. 2 cm tear in caudal.
228.0	252.5	104.8	25.5	56.5	92.5	04	FR	SSL	10U	444603	5981954	Y	1307	41250F216B	1	23-Sep-01	Nechako	114.9	0	Internal RT 149.700 CH20 CD3.
166.0	186.0	35.4	19.0	39.5	67.0	97	FR	SSL	10U	439752	5984556	Y	1313	41250F5929	1	24-Sep-01	Nechako	124.7	0	Slight hook damage. 10 cm tear in left pectoral. 5 cm tear in upper caudal. 2 cm tear in lower caudal.
161.0	182.5	30.8	18.0	40.5	61.5	12	FR	SSL	10U	444747	5982239	Y	1305	412510146B	1	22-Sep-01	Nechako	115.2	0	Hook damage to mouth. 2 cm tear in upper caudal fin.
156.5	176.5	26.3	19.5	41.0	57.0	97	FR	SSL	10U	446147	5982310	Y	1330	4125131B53	1	28-Sep-01	Nechako	116.8	0	Two 2 cm tears in caudal, some abrasion from line, sharp scutes.
158.0	181.5	31.3	19.5	42.0	61.2	97	FR	SSL	10U	439752	5984556	Y	1340	412513715B	1	2-Oct-01	Nechako	124.7	0	Bronze coloration, sharp scutes.

Continued…

Table C1 Capture information for white sturgeon in the study area, 2001 and 2002.

Fork Length (cm)	Total Length (cm)	Weight (kg)	Post-orbital Length (cm)	Post-opercular Length (cm)	Girth (cm)	Sex[1]	Age Method[2]	Capture Method[3]	UTM Co-ordinates			Dart/T-Anchor Tag		PIT Tag No.	Bio-sample Code[5]	Capture Date	Waterbody	Site (km)	Capture Code[6]	Comments
									Grid Zone	Easting	Northing	Colour[4]	No.							
162.5	185.0	35.4	18.5	41.0	64.5	04	FR	SSL	10U	444628	5982104	Y	1334	4125143E16	1	29-Sep-01	Nechako	115.1	0	Internal RT149.700 CH20 CD10. Small amount of hemorrhaging from hook. Scute V2 on left side removed.
183.5	207.5	51.3	20.0	46.5	74.0	04	FR	SSL	10U	445725	5982016	Y	1328	412515071A	1	28-Sep-01	Nechako	116.2	0	Internal RT149.700 CH20 CD8.
198.0	224.0	52.6	23.5	51.0	72.0	97	FR	SSL	10U	445725	5982016	Y	1346	4138686B7D	1	13-Oct-01	Nechako	116.2	0	Abrasions due to line wrap. Scute D6 damaged.
138.5	154.0	17.7	18.0	36.0	51.0	97	FR	SSL	10U	444742	5982239	Y	1324	413913523F	1	26-Sep-01	Nechako	115.2	0	Scute D6 missing.
147.5	167.5	24.9	16.5	37.0	59.0	97	FR	SSL	10U	439937	5985052	Y	1333	4139136C2A	1	28-Sep-01	Nechako	125.2	0	Upper lobe of caudal with irregular growth.
171.5	189.0	37.6	21.0	45.0	67.0	12	FR	SSL	10U	480676	5981362	Y	1344	41392A0951	1	12-Oct-01	Nechako	68.3	0	Two 2 cm tears in caudal fin.
157.0	178.0	26.3	20.5	42.0	59.0	97		SSL	10U	445725	5982016	Y	1308	7F7D7C5033	0	23-Sep-01	Nechako	116.2	2	Recapture. Small tear in right pectoral. Previous tag Y-418 and RT 149.740 CH.22 CODE 13 missing.
154.5	169.5	25.9	20.0	41.5	58.0	97	FR	SSL	10U	446147	5982310	Y	1343	4139522777	1	5-Oct-01	Nechako	116.8	0	Rounded fin.
125.5	140.5	13.1	15.0	32.0	44.5	97	FR	SSL	10U	444603	5981954	Y	1322	41424B7273	1	26-Sep-01	Nechako	114.9	0	
141.0	156.5	19.5	15.0	34.0	51.0	97	FR	SSL	10U	439937	5985052	Y	1331	41497E087F	1	28-Sep-01	Nechako	125.2	0	5 cm tears on caudal. Scute D5 removed.
203.0	221.5	69.4	22.5	51.5	84.5	14		SSL	10U	439971	5984906	Y	1316	7F7D771A4B	0	23-Sep-01	Nechako	125.1	2	Recapture. Internal RT 149.700 CH20 CD7. Slow to recover, but tracked u/s 2 hours later.
139.0	154.0	18.6	16.0	35.5	49.0	97		SSL	10U	445725	5982016	Y	1317	7F7D4F521F	0	25-Sep-01	Nechako	116.2	2	Recapture. Deformed caudal. Scute D4 damaged, but not removed.
151.0	171.0	24.5	15.5	36.0	55.0	97		SSL	10U	439937	5985052	Y	1321	7F7B0C6725	0	25-Sep-01	Nechako	125.2	2	Recapture. Previous tag Y-40 lost at boat.
174.0	198.0	44.5	19.0	42.0	71.0	03		AB	10U	445705	5982063	Y	1327	7F7D7D3401	0	27-Sep-01	Nechako	116.2	2	Recapture. 5 cm tear in caudal. Missing tag Y-77 and RT 149.460 CH 8 CD32. Very darkly pigmented.
151.5	170.5	24.9	18.5	38.0	55.0	97		SSL	10U	439937	5985052	Y	1332	7F7B0C3231	0	28-Sep-01	Nechako	125.2	2	Recapture. Floy Y-1492 missing.
123.5	139.0	14.0	15.5	31.5	96.5	98		SSL	10U	445725	5982016	Y	1336	22234A7C59		30-Sep-01	Nechako	116.2	2	Recapture. Sharp scutes.
167.5	193.0	31.8	21.0	45.0	63.5	97		SSL	10U	445725	5982016	Y	1342	7F7B0C4E1D	0	4-Oct-01	Nechako	116.2	2	Recapture. Floy Tag Y326 missing
206.0	231.0	73.9	25.5	54.0	84.4	04		SSL	10U	445725	5982016	Y	1347	7F7D7D7063	0	13-Oct-01	Nechako	116.2	2	Recapture. Internal RT 149.700 CH20 CD15. Lobe middle dorsal fin, missing external RT 149.740 CH 22 CD 109.
92.0	102.5	5.5	12.0	23.0	34.5	98		SSL	10U	439971	5984906	Y	1456	41392C0A2D	0	28-Sep-01	Nechako	125.1	2	Recapture. Extremely sharp scutes.
141.0	159.5	21.8	17.0	35.5	54.5	13		SSL	10U	439752	5984556	Y	1468	4124735E01	0	24-Sep-01	Nechako	124.7	2	Internal RT 149.700 CH20 CD5. Recapture. Slight hook damage. Scute D1 removed.
151.5	169.0	26.8	18.5	39.5	61.0	03		SSL	10U	445725	5982016	Y	1472	7F7B0C4C09	0	1-Oct-01	Nechako	116.2	2	Recapture.
116.5	132.5	9.5	12.5	26.5	41.0	98	FR	SSL	10U	475336	5979740	Y	1496	7F7B03057D	0	14-Sep-01	Nechako	74.9	2	2 cm in left pelvic fin. Extra lobe at posterior end of dorsal fin. Captured twice previously.
203.0	226.0	68.2	23.5	53.0	83.5	04		SSL	10U	481938	5981832	Y	1498	7F7D43767B	0	15-Sep-01	Nechako	67.0	2	Internal RT 149.700 CH20 CD1. Recapture.
171.5	194.0	40.8	20.5	44.0	70.0	03		SSL	10U	447477	5979518	Y	1499	7F7B033461	0	20-Sep-01	Nechako	111.2	2	Recapture. Previous tag Y-403 missing.
N/A								SSL	10U	444628	5982104	Y	1500			26-Sep-01	Nechako	115.1	2	Released, recently captured.
N/A								SSL	10U	444628	5982104				0	23-Sep-01	Nechako	115.1	0	Lost at boat, approx 1.5 m; no visible tag.
167.0	190.0	36.8	19.5	42.0	66.0	12		SSL	10U	445725	5982016	Y	407	7F7D781A4D	0	21-Sep-01	Nechako	116.2	2	Recapture. Sharp scutes.
N/A								SSL	10U	446147	5982310				0	29-Sep-01	Nechako	116.8	0	Escaped at boat - no floy, approximately 1.2 m in length.

Continued…

Table C1 Capture information for white sturgeon in the study area, 2001 and 2002.

Fork Length (cm)	Total Length (cm)	Weight (kg)	Post-orbital Length (cm)	Post-opercular Length (cm)	Girth (cm)	Sex[1]	Age Method[2]	Capture Method[3]	UTM Co-ordinates			Dart/T-Anchor Tag		PIT Tag No.	Bio-sample Code[5]	Capture Date	Waterbody	Site (km)	Capture Code[6]	Comments
									Grid Zone	Easting	Northing	Colour[4]	No.							
153.5	173.0	25.4	20.5	41.0	56.5	04	FR	SSL	10U	439752	5984556	Y	1345	413B2F1C79	1	13-Oct-01	Nechako	124.7	0	Internal RT 149.700 CH20 CD13.
178.0	201.0	45.4	19.5	45.0	70.0	14		SSL	10U	465314	5982465	Y	1349	7F7B0C4A60	0	13-Jul-02	Nechako	88.7	2	Internal RT149.320 CH1 CD24 Recapture.
232.0	262.0	94.0	25.5	60.0	87.5	97		SSL	10U	465314	5982465	Y	1350	7F7D767B3B	0	13-Jul-02	Nechako	88.7	2	Recapture.
193.0	217.0	57.7	24.0	52.0	76.0	97		SSL	10U	464138	5982172	Y	1348	7F7B0C3010	0	13-Jul-02	Nechako	90.3	2	Recapture. Scute D6 removed.
180.0	206.0	50.4	22.0	48.0	72.5	13	FR	SSL	10U	464092	5982201	Y	1351	413B106468	1	14-Jul-02	Nechako	90.3	0	Scute D5 damaged but not removed. Lobe on left pectoral fin. Torn caudal and pectoral fins.

[1] For a description of sexual maturity codes, see Appendix E.
[2] FR = section of pectoral fin ray.
[3] SSL = set line; AB = angling.
[4] Y = yellow.
[5] 0 = no sample; 1 = tissue sampled from distal end of pectoral fin.
[6] 0 = original capture; 2 = recapture.

Table C2 Descriptive summary of sexual maturity of white sturgeon sampled in the study area, 2001 and 2002.

Maturity Code[1]	Fork Length (cm)	Total Length (cm)	Post-orbital Length (cm)	Post-opercular Length (cm)	Girth (cm)	Weight (kg)	Sample Site	Date	Dart/T-Anchor Tag		PIT Tag No.	Radio Tag[3]			General Description
									Colour[2]	No.		Frequency	Channel	Code	
03	185.0	207.5	19.5	46.0	78.0	53.9	AB-116.2M	20-Sep-01	Y	1500	4124766A7E				**Male:** Testes white with white speckling, filling 1/3 ventral cavity. Folding in posterior portion, folds forming lobes mid-cavity. Some fluid in body cavity. Surgical biopsy taken.
97	147.5	163.0	17.5	39.0	58.0	24.0	SSL-124.7R	13-Oct-01	Y	0088	501F7A3051	149.700	20	6	**Unknown:** Fluid in cavity difficult to assess. Suspect male with cream coloured testes larger on right side, more cream white on dorsal surface. Some heavy grey pigmentation and folds forming lobes. Surgical biopsy taken. Implanted radio tag b/c from Nechako/Fraser confluence. Potential 03.
14	175.0	196.0	21.0	45.0	68.0	42.2	SSL-115.2	22-Sep-01	Y	1306	4124680C7A	149.700	20	4	**Female**: Ovaries filling body cavity. Eggs are uniform in size, easily separate from ovarian tissue; egg diameter 2.7 mm (10 egg average). Surgical biopsy taken.
04	228.0	254.0	24.5	57.0	88.5	95.2	SSL-116.8L	26-Sep-01	Y	1326	41246D0D41	149.700	20	11	**Male:** Testes filling >1/2 ventral cavity. Testes are large white folds forming lobes, more developed on right hand side. Milt present in stretcher.
03	178.5	201.0	21.0	45.0	71.5	46.3	SSL-116.2R	21-Sep-01	Y	1302	22235D2A63				**Male:** Testes fill 1/3 of ventral cavity, with light pigmentation. Fluid in body cavity. Surgical biopsy taken.
04	199.0	223.0	24.0	51.0	76.0	60.3	SSL-116.8L	25-Sep-01	Y	1320	4124741829	149.700	20	9	**Male:** Testes are white with light speckling filling 1/3 to 1/2 of ventral cavity; the right side more developed than the left, folds forming lobes in anterior portion. Surgical biopsy taken.
03	187.0	213.0	23.0	50.5	73.0	50.8	SSL-114.9R	26-Sep-01	Y	1323	41247A221A				**Male:** Testes filling about 1/3 of ventral cavity, and cream coloured with light smoky pigmentation. Some folds beginning to form lobes in right anterior portion.
03	164.5	187.5	17.5	38.5	60.0	31.3	SSL-116.2L	25-Sep-01	Y	1318	41247A5430				**Male:** Some fluid in cavity; difficult to view dorsal surface. Testes are cream colored, some light speckling, filling less than 1/3 of ventral cavity. Folds beginning to form folds in the anterior portion.
03	188.0	211.5	22.5	50.0	73.0	49.0	SSL-116.2R	21-Sep-01	Y	1303	41247B7427				**Male:** Testes fill 1/2 ventral cavity, smoky pigmentation, some folds forming lobes in anterior portion. Dark smoky pigmentation in veins along ventral surface. Surgical biopsy taken.
04	188.0	212.0	23.0	49.0	76.0	55.3	SSL-116.8L	1-Oct-01	Y	1338	41247C4F74	149.700	20	2	**Male:** Testes are large white, small amount of smoky pigmentation filling approx. 3/4 of ventral cavity. Folds forming lobes on left hand side in posterior.
03	155.5	173.5	19.0	41.0	58.0	25.9	SSL-114.9R	22-Sep-01	Y	1304	41247D0448				**Male:** Fluid present in the body cavity. Testes are white with some light speckling, filling approx 1/4 of ventral cavity. Some folding in anterior portion, more developed on right hand side. Early 03. Surgical biopsy taken.
02	172.0	196.0	20.5	45.0	72.5	39.0	SSL-124.7R	24-Sep-01	Y	1314	41250B2C18				**Male:** Testes cream coloured with smoky pigmentation, filling approximately 1/4 of ventral cavity. Some folds forming lobes in the anterior portion on the right side, more developed on the right.
04	234.0	258.0	26.0	55.5	81.0	87.5	SSL-115.2R	1-Oct-01	Y	1337	41250F0A39	149.700	20	12	**Male:** Testes are white, filling more than 1/2 of ventral cavity. Folds forming lobes on right side. Late 03, early 04. Surgical biopsy taken.

Continued…

Table C2 Descriptive summary of sexual maturity of white sturgeon sampled in the study area, 2001 and 2002.

Maturity Code[1]	Fork Length (cm)	Total Length (cm)	Post-orbital Length (cm)	Post-opercular Length (cm)	Girth (cm)	Weight (kg)	Sample Site	Date	Dart/T-Anchor Tag		PIT Tag No.	Radio Tag[3]			General Description
									Colour[2]	No.		Frequency	Channel	Code	
04	228.0	252.5	25.5	56.5	92.5	104.8	SSL-114.9R	23-Sep-01	Y	1307	41250F216B	149.700	20	3	**Male:** Testes white with light speckling, filling 2/3 of ventral cavity. Lobes forming folds in anterior portion. Early 04, late 03. Surgical biopsy taken.
97	166.0	186.0	19.0	39.5	67.0	35.4	SSL-124.7R	24-Sep-01	Y	1313	41250F5929				**Unknown:** Tissue cream colored with light smoky pigmentation. Gonads filling less than 1/3 ventral cavity. Folds developing in anterior portion. Tissue on dorsal surface underneath may be eggs (clear spots like oil droplets). Either early 03 or 12. Surgical biopsy taken.
12	161.0	182.5	18.0	40.5	61.5	30.8	SSL-115.2	22-Sep-01	Y	1305	412510146B				**Female:** Ovaries are cream colored with smoky pigmentation, filling less than 1/3 body cavity. Some folds forming lobes, more developed on right hand side. Eggs are white, varying in diameter (<.5 mm in diameter). Surgical biopsy taken.
04	162.5	185.0	18.5	41.0	64.5	35.4	SSL-115.1R	29-Sep-01	Y	1334	4125143E16	149.700	20	10	**Male:** Testes are white, with some light pigmentation, filling approx. 1/2 of ventral cavity. Folds forming lobes on the right side. Some folding on left. Early 04. Surgical biopsy taken.
04	183.5	207.5	20.0	46.5	74.0	51.3	SSL-116.2R	28-Sep-01	Y	1328	412515071A	149.700	20	8	**Male:** Fluid in ventral cavity. Testes white with light speckling, filling 1/2 ventral cavity. Some folds. Early 04. Surgical biopsy taken.
12	171.5	189.0	21.0	45.0	67.0	37.6	SSL-68.3	12-Oct-01	Y	1344	41392A0951				**Female:** Ovaries are cream coloured with little pigmentation, fill <1/2 ventral cavity. Eggs are small, translucent to white, varying in diameter, less than 0.5 mm.
14	203.0	221.5	22.5	51.5	84.5	69.4	SSL-125.1L	23-Sep-01	Y	1316	7F7D771A4B	149.700	20	7	**Female:** Ovaries are cream coloured with light smoky pigmentation, filling 1/3 of the ventral cavity. Eggs are light brown embedded in tissue. No eggs visible on right side. Surgical biopsy taken.
03	174.0	198.0	19.0	42.0	71.0	44.5	AB116.2M	27-Sep-01	Y	1327	7F7D7D3401				**Male:** Some fluid present in the cavity. Testes are creamy yellow with heavy pigmentation, filling about 1/4 of the ventral cavity. Some folding in anterior portion.
04	206.0	231.0	25.5	54.0	84.4	73.9	SSL116.2L	13-Oct-01	Y	1347	7F7D7D7063	149.700	20	15	**Male:** Testes creamy with milky pigment, filling 2/3 of the ventral cavity. Folds forming lobes in the anterior right, posterior left. Early 04.
13	141.0	159.5	17.0	35.5	54.5	21.8	SSL-124.7R	24-Sep-01	Y	1468	4124735E01	149.700	20	5	**Female:** Ovaries yellowish with little black discoloration, filling 1/3 to 1/2 of the ventral cavity. Eggs are white, uniform in size (approximately 1.8 mm), easily detached from ovarian tissue. Likely to spawn in 2003. Surgical biopsy taken/egg sample.
03	151.5	169.0	18.5	39.5	61.0	26.8	SSL116.2R	1-Oct-01	Y	1472	7F7B0C4C09				**Male:** Testes are cream to yellow color with light smoky pigmentation, filling about 1/3 ventral cavity. Folds forming lobes.
04	203.0	226.0	23.5	53.0	83.5	68.2	SSL-67.0R	15-Sep-01	Y	1498	7F7D43767B	149.700	20	1	**Male:** Testes white with some speckling on left side., filling 7/8 ventral cavity. Lobes forming folds. Surgical biopsy taken.
03	171.5	194.0	20.5	44.0	70.0	40.8	SSL111.2R	20-Sep-01	Y	1499	7F7B033461				**Male:** Testes with light speckling, white color more obvious on right, filling 1/4 ventral cavity. Turgid belly likely from full stomach. Surgical biopsy taken.

Continued…

Table C2 Descriptive summary of sexual maturity of white sturgeon sampled in the study area, 2001 and 2002.

Maturity Code[1]	Fork Length (cm)	Total Length (cm)	Post-orbital Length (cm)	Post-opercular Length (cm)	Girth (cm)	Weight (kg)	Sample Site	Date	Dart/T-Anchor Tag		PIT Tag No.	Radio Tag[3]			General Description
									Colour[2]	No.		Frequency	Channel	Code	
12	167.0	190.0	19.5	42.0	66.0	36.8	SSL116.2R	21-Sep-01	Y	407	7F7D781A4D				**Female:** Ovaries are cream and yellow with light speckling throughout, filling 1/3 of anterior portion of body cavity. Lobing in the anterior portion. Eggs located on dorsal side of anterior and are white and <1 mm in diameter. Previously identified as 03 male. Surgical biopsy taken.
04	153.5	173.0	20.5	41.0	56.5	25.4	SSL124.7R	13-Oct-01	Y	1345	413B2F1C79	149.700	20	13	**Male:** Testes are white with slight pigmentation, and some pink in spots, filling 3/4 of the ventral cavity. Folds forming lobes in anterior and mid-ventral cavity. Surgical biopsy taken.
14	178.0	201.0	19.5	45.0	70.0	45.4	SSL88.7L	13-Jul-02	Y	1349	7F7B0C4A60	149.320	1	24	**Female:** Ovaries filling 2/3 of the ventral cavity. Eggs easily detached white to black and brown; 10 egg average = 16 mm
13	180.0	206.0	22.0	48.0	72.5	50.4	SSL90.3L	14-Jul-02	Y	1351	413B106468				**Female:** Ovaries grey with smoky pigmentation, filling 1/2 to 1/3 ventral cavity. Eggs are small, white, varying in diameter.

[1] For a description of sexual maturity codes, see Appendix E

[2] Tag colour Y = "Yellow"

[3] Lotek Engineering Inc. hi-frequency radio transmitter.

Table C3 Length, weight, and age data for sexual maturity stages of white sturgeon sampled in the study area, 2001 to 2002.

Sex Code[1]	Length Data			Weight Data		
	n	Mean Fork Length (cm) and (S.D.)[2]	Range of Fork Length (cm)	*n*	Mean Weight (kg) and (S.D.)	Range of Weight (kg)
Males						
20	-[3]	-	-	-	-	-
01	-	-	-	-	-	-
02	1	172.0	-	1	39.0	-
03	9	172.8 (13.4)	151.5 - 188.0	9	41.0 (10.6)	25.9 - 53.9
04	10	198.6 (27.4)	153.5 - 234.0	10	65.7 (25.5)	25.4 - 104.8
05	-	-	-	-	-	-
06	-	-	-	-	-	-
07	-	-	-	-	-	-
Females						
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	3	166.5 (5.3)	161.0 - 171.5	3	35.7 (3.7)	30.8 - 37.6
13	2	160.5 (27.6)	141.0 - 180.0	2	36.1 (20.2)	21.8 - 50.4
14	3	185.3 (15.4)	175.0 - 203.0	3	52.3 (14.9)	42.2 - 69.4
15	-	-	-	-	-	-
16	-	-	-	-	-	-
17	-	-	-	-	-	-
Unknown[4]						
97/98	32	151.9 (29.4)	92.0 - 232.0	32	28.2 (18.6)	5.5 - 94.0

[1] For a description of sexual maturity codes, see Appendix E.

[2] S.D. = standard deviation

[3] Data not available.

[4] These fish were not surgically examined to assess state of sexual maturity.

Table C4 Summary of conventionally tagged white sturgeon recaptured in the Nechako River, 2001 and 2002.

Original Capture Data									Recapture Data									Summary	
Floy Tag		PIT Tag	Length (cm)		Weight	Capture			Floy Tag		PIT Tag	Length (cm)		Weight	Capture			Days-at-	Movement
C[1]	Number	Number	Fork	Total	(kg)	River	Site (km)	Date	C	Number	Number	Fork	Total	(kg)	River	Site (km)	Date	Large[2]	(km)[3]
Y	88	501F7A3051	138.0	154.0	20.0	Nechako	0.5	17-Jul-00	Y	88	501F7A3051	147.5	163.0	24.0	Nechako	124.7	13-Oct-01	453	124.2
Y	17	7F7B0C5763	215.0	243.5	77.6	Nechako	116.2	15-Sep-95	Y	17	7F7B0C5763	219.0	248.5	71.2	Nechako	116.8	30-Sep-01	2207	0.6
Y	4	22235D2A63	165.0	184.5	38.1	Nechako	107.5	18-Aug-95	Y	1302	22235D2A63	178.5	201.0	46.3	Nechako	116.2	21-Sep-01	2226	8.7
Y	1125	4125034473	130.0	148.0	15.4	Fraser	760.0	17-Aug-98	Y	1125	4125034473	-	-	>12	Nechako	125.2	26-Sep-01	1136	155.2
Y	418	7F7D7C5033	153.5	173.5	24.1	Nechako	111.2	1-Sep-98	Y	1308	7F7D7C5033	157.0	178.0	26.3	Nechako	116.2	23-Sep-01	1118	5.0
Y	95	7F7D771A4B	186.5	215.0	53.2	Nechako	126.5	20-Sep-96	Y	95	7F7D771A4B	198.5	217.0	50.4	Nechako	116.2	18-Sep-97	363	-10.3
Y	95	7F7D771A4B	198.5	217.0	50.4	Nechako	116.2	18-Sep-97	Y	1316	7F7D771A4B	203.0	221.5	69.4	Nechako	125.1	23-Sep-01	1466	8.9
Y	92	7F7D4F521F	133.0	148.5	18.2	Nechako	91.5	12-Sep-96	Y	1452	7F7D4F521F	137.5	154.5	17.3	Nechako	116.2	08-Sep-98	726	24.7
Y	1452	7F7D4F521F	137.5	154.5	17.3	Nechako	116.2	08-Sep-98	Y	1317	7F7D4F521F	139.0	154.0	18.6	Nechako	116.2	25-Sep-01	1113	0.0
Y	40	7F7B0C6725	129.5	148.0	16.8	Nechako	124.7	17-Sep-97	Y	40	7F7B0C6725	137.5	154.0	18.6	Nechako	116.2	1-Sep-98	349	-8.5
Y	40	7F7B0C6725	137.5	154.0	18.6	Nechako	116.2	1-Sep-98	Y	1321	7F7B0C6725	151.0	171.0	24.5	Nechako	125.2	25-Sep-01	1120	9.0
Y	77	7F7D7D3401	162.0	185.5	37.7	Nechako	124.5	7-Sep-96	Y	1327	7F7D7D3401	174.0	198.0	44.5	Nechako	116.2	27-Sep-01	1846	-8.3
O	4508	7F7B0C3231	130.5	147.0	16.8	Nechako	92.4	10-Jun-95	Y	1492	7F7B0C3231	145.0	164.0	22.7	Nechako	66.2	14-Sep-99	1557	-26.2
Y	1492	7F7B0C3231	145.0	164.0	22.7	Nechako	66.2	14-Sep-99	Y	1332	7F7B0C3231	151.5	170.5	24.9	Nechako	125.2	28-Sep-01	745	59.0
Y	1	22234A7C59	109.0	123.5	11.4	Nechako	110.1	18-Aug-95	Y	1336	22234A7C59	123.5	139.0	14.0	Nechako	116.2	30-Sep-01	2235	6.1
Y	13	7F7B0C4E1D	162.5	190.0	35.9	Nechako	124.5	15-Sep-95	Y	326	7F7B0C4E1D	168.0	196.0	32.7	Nechako	116.2	4-Sep-98	1085	-8.3
Y	326	7F7B0C4E1D	168.0	196.0	32.7	Nechako	116.2	4-Sep-98	Y	1342	7F7B0C4E1D	167.5	193.0	31.8	Nechako	116.2	4-Oct-01	1126	0.0
Y	60	7F7D7D7063	193.0	218.0	59.9	Nechako	126.5	18-Jun-96	Y	36	7F7D7D7063	193.0	218.0	61.3	Nechako	110.2	7-Jun-97	354	-16.3
Y	36	7F7D7D7063	193.0	218.0	61.3	Nechako	110.2	7-Jun-97	Y	1347	7F7D7D7063	206.0	231.0	73.9	Nechako	116.2	13-Oct-01	1589	6.0
Y	1456	41392C0A2D	77.0	88.0	3.5	Nechako	125.2	5-Jul-99	Y	1456	41392C0A2D	92.0	102.5	5.5	Nechako	125.1	28-Sep-01	816	-0.1
Y	1468	4124735E01	137.0	155.0	20.0	Nechako	124.6	9-Sep-99	Y	1468	4124735E01	141.0	159.5	21.8	Nechako	124.7	24-Sep-01	746	0.1
Y	350	7F7B0C4C09	143.0	159.0	21.8	Nechako	124.7	7-Sep-98	Y	1472	7F7B0C4C09	146.0	163.0	23.1	Nechako	125.0	9-Sep-99	367	0.3
Y	1472	7F7B0C4C09	146.0	163.0	23.1	Nechako	125.0	9-Sep-99	Y	1472	7F7B0C4C09	151.5	169.0	26.8	Nechako	116.2	1-Oct-01	753	-8.8
Y	89	7F7B03057D	90.0	103.0	6.8	Nechako	90.2	12-Sep-96	Y	1496	7F7B03057D	108.0	122.0	9.5	Nechako	72.7	14-Sep-99	1097	-17.5
Y	1496	7F7B03057D	108.0	122.0	9.5	Nechako	72.7	14-Sep-99	Y	1496	7F7B03057D	116.5	132.5	9.5	Nechako	74.9	14-Sep-01	731	2.2
Y	94	7F7D43767B	191.0	218.5	54.1	Nechako	79.1	16-Sep-96	Y	94	7F7D43767B	198.5	225.0	63.6	Nechako	72.4	13-Sep-98	727	-6.7
Y	94	7F7D43767B	198.5	225.0	63.6	Nechako	72.4	13-Sep-98	Y	1498	7F7D43767B	203.0	226.0	68.2	Nechako	67.0	15-Sep-01	1098	-5.4
Y	403	7F7B033461	158.0	178.0	29.5	Nechako	96.4	19-Jun-98	Y	1499	7F7B033461	171.5	194.0	40.8	Nechako	111.2	20-Sep-01	1189	14.8
Y	9	7F7D781A4D	155.0	177.0	34.5	Nechako	116.5	21-Aug-95	Y	9	7F7D781A4D	158.0	179.0	34.5	Nechako	116.2	8-May-97	626	-0.3
Y	9	7F7D781A4D	158.0	179.0	34.5	Nechako	116.2	8-May-97	Y	407	7F7D781A4D	163.0	185.0	37.2	Nechako	116.2	22-Jun-98	410	0.0
Y	407	7F7D781A4D	163.0	185.0	37.2	Nechako	116.2	22-Jun-98	Y	407	7F7D781A4D	167.0	190.0	36.8	Nechako	116.2	21-Sep-01	1187	0.0
Y	73	7F7B0C4A60	163.0	184.0	36.4	Stuart	47.6	14-Jul-96	Y	406	7F7B0C4A60	170.5	192.5	40.4	Nechako	115.2	22-Jun-98	708	73.8
Y	406	7F7B0C4A60	170.5	192.5	40.4	Nechako	115.2	22-Jun-98	Y	1349	7F7B0C4A60	178.0	201.0	45.4	Nechako	88.7	13-Jul-02	1482	-26.5
Y	75	7F7D767B3B	230.5	264.0	100.9	Nechako	125.1	6-Sep-96	Y	1350	7F7D767B3B	232.0	262.0	94.0	Nechako	88.7	13-Jul-02	2136	-36.4
Y	28	7F7B0C3010	175.5	198.0	50.4	Nechako	114.9	16-Sep-95	Y	1348	7F7B0C3010	193.0	217.0	57.7	Nechako	90.3	13-Jul-02	2492	-24.6
Y	1500	4124766A7E	185.0	207.5	53.9	Nechako	116.2	20-Sep-01	Y	1500	4124766A7E	185.0	207.5	53.9	Nechako	115.1	26-Sep-01	6	-1.1

[1] Tag Color: O = orange; Y = yellow.

[2] Indicates number of days since original capture.

[3] Negative values (-) indicate downstream movement.

APPENDIX D

MARK-RECAPTURE AND RADIO TELEMETRY DATA

Appendix D1 Location (river km) of radio-tagged white sturgeon in the Nechako, Stuart, and Fraser rivers, 2001 to 2002.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2001									
					15-Sep [S]	19-Sep [B]	22-Sep [S]	23-Sep [S]	24-Sep [S]	25-Sep [S]	26-Sep [S]	28-Sep [S]	29-Sep [S]	1-Oct [S]
149.700	1	4	15-Sep-01	67.0	67.0									
149.700	2	4	1-Oct-01	116.8										116.8
149.700	3	4	23-Sep-01	114.9				114.9						
149.700	4	14	22-Sep-01	115.2			115.2							
149.700	5	13	24-Sep-01	124.7					124.7					
149.700	6	3 [a]	13-Oct-01	124.7										
149.700	7	14	23-Sep-01	125.1				125.1						
149.700	8	4	28-Sep-01	116.2								116.2		
149.700	9	4	25-Sep-01	116.8						116.8				
149.700	10	4	29-Sep-01	115.1									115.1	
149.700	11	4	26-Sep-01	116.8							116.8			
149.700	12	4	1-Oct-01	115.2										115.2
149.700	13	4	13-Oct-01	124.7										
149.700	15	4	13-Oct-01	116.2										
149.320	24	14	13-Jul-02	88.7										

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.

Appendix D1 Continued.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2001			2002						
					13-Oct [S]	10-Nov [A]	7-Dec [A]	6-Feb [A]	18-Mar [S]	26-Apr [A]	18-May [A]	28-May [A]	5-Jun [B]	7-Jun [A]
149.700	1	4	15-Sep-01	67.0		70.5	70.6	70.2			76.0	79.8		
149.700	2	4	1-Oct-01	116.8			116.0	116.0	116.2	116.0	127.4	131.1		140.5
149.700	3	4	23-Sep-01	114.9		116.0	116.0		116.2		127.0	130.9	135.0	
149.700	4	14	22-Sep-01	115.2		116.0	116.0		116.3	116.0	116.0	133.6		
149.700	5	13	24-Sep-01	124.7		116.0	116.0	116.0	116.2	116.0	131.9	130.7		124.0
149.700	6	3 [a]	13-Oct-01	124.7	124.7	70.0	124.7	125.0	124.7		132.5	134.9		137.0
149.700	7	14	23-Sep-01	125.1		116.0	116.0	116.0	116.4		116.0	116.1		116.0
149.700	8	4	28-Sep-01	116.2		116.0			116.2	116.0	124.5	135.3		140.5
149.700	9	4	25-Sep-01	116.8			116.0		116.2	116.0	127.1			140.5
149.700	10	4	29-Sep-01	115.1		116.0			116.3		109.7	131.6		81.0
149.700	11	4	26-Sep-01	116.8		116.0		116.0	116.3	116.0	116.0	135.6		140.5
149.700	12	4	1-Oct-01	115.2			116.0		116.3	116.0	126.8	130.9	123.2	124.0
149.700	13	4	13-Oct-01	124.7	124.7	70.0	124.7	125.0	124.6	131.0	121.5	131.3		137.0
149.700	15	4	13-Oct-01	116.2	116.2		116.0		116.2	116.0	116.0	120.0	126.2	124.0
149.320	24	14	13-Jul-02	88.7										

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.

Appendix D1 Continued.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2002									
					10-Jun [B]	11-Jun [B]	12-Jun [A]	13-Jun [B]	14-Jun [B]	15-Jun [B]	16-Jun [B]	18-Jun [A]	19-Jun [B]	20-Jun [B]
149.700	1	4	15-Sep-01	67.0			74.5		76.1			74.7	75.0	
149.700	2	4	1-Oct-01	116.8			79.2			81.0			80.1	
149.700	3	4	23-Sep-01	114.9	128.9		129.0					124.6		
149.700	4	14	22-Sep-01	115.2			66.3	66.3	66.3		66.3	66.3	66.3	67.5
149.700	5	13	24-Sep-01	124.7		127.0	126.9					120.2		
149.700	6	3 [a]	13-Oct-01	124.7	135.7	134.6	100.5		69.8			28.7		
149.700	7	14	23-Sep-01	125.1		116.1	116.1			116.1		116.2		
149.700	8	4	28-Sep-01	116.2			78.4			80.6		80.4	78.6	
149.700	9	4	25-Sep-01	116.8	131.0	128.0	131.3					80.0 [u]	79.0	
149.700	10	4	29-Sep-01	115.1			77.5			79.8		79.4	76.1	
149.700	11	4	26-Sep-01	116.8	149.5							140.3		
149.700	12	4	1-Oct-01	115.2								104.0	72.0	66.3
149.700	13	4	13-Oct-01	124.7			136.7						104.8	
149.700	15	4	13-Oct-01	116.2		116.2	116.3			116.1		116.3		
149.320	24	14	13-Jul-02	88.7										

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.
[u] Could not code during flight. Location based on subsequent boat tracking.

Appendix D1 Continued.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2002									
					22-Jun [A]	24-Jun [B]	25-Jun [A&GS]	26-Jun [GS]	28-Jun [A]	29-Jun [B]	1-Jul [B]	3-Jul [B]	4-Jul [GS]	5-Jul [B]
149.700	1	4	15-Sep-01	67.0	76.2		76.2			75.1	75.0	75.7		
149.700	2	4	1-Oct-01	116.8	80.2		80.8	90.0	90.2			90.2		90.3
149.700	3	4	23-Sep-01	114.9	116.0				124.5			90.0		90.0
149.700	4	14	22-Sep-01	115.2	74.7	90.0	90.4	90.0	90.4		90.0	90.9		90.0
149.700	5	13	24-Sep-01	124.7	119.8		119.8		115.8			116.4		
149.700	6	3 [a]	13-Oct-01	124.7	28.7		29.4		28.8					
149.700	7	14	23-Sep-01	125.1	116.0		115.8					109.9		
149.700	8	4	28-Sep-01	116.2	80.0		79.0		76.4	75.2	76.0	74.8	90.0	
149.700	9	4	25-Sep-01	116.8	20.1 (SR)		104.6 (SR)							
149.700	10	4	29-Sep-01	115.1	75.8		75.8		75.0	75.0	73.3	75.2		
149.700	11	4	26-Sep-01	116.8	138.8		134.5		139.2			123.8		
149.700	12	4	1-Oct-01	115.2	58.2									
149.700	13	4	13-Oct-01	124.7	135.0		131.5		131.5			94.3		94.2
149.700	15	4	13-Oct-01	116.2	116.0		115.8		115.3			114.4		
149.320	24	14	13-Jul-02	88.7										

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.
[u] Could not code during flight. Location based on subsequent boat tracking.

Appendix D1 Continued.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2002									
					6-Jul [B]	7-Jul [GS]	8-Jul [B]	10-Jul [B]	11-Jul [B]	12-Jul [B]	13-Jul [B]	14-Jul [B]	17-Jul [GS]	17-Jul [A]
149.700	1	4	15-Sep-01	67.0					89.7					73.6
149.700	2	4	1-Oct-01	116.8	90.3		90.5	90.3	90.3	90.3	90.3	90.3		82.9
149.700	3	4	23-Sep-01	114.9										
149.700	4	14	22-Sep-01	115.2	90.0	90.0	91.5	98.0	90.3	90.2	89.3			66.9
149.700	5	13	24-Sep-01	124.7										116.4
149.700	6	3 [a]	13-Oct-01	124.7										28.8
149.700	7	14	23-Sep-01	125.1				96.9	97.5			98.3		97.8
149.700	8	4	28-Sep-01	116.2										146.4 (SR)[c]
149.700	9	4	25-Sep-01	116.8										
149.700	10	4	29-Sep-01	115.1				88.2		88.2		88.2		87.5
149.700	11	4	26-Sep-01	116.8										121.2
149.700	12	4	1-Oct-01	115.2										
149.700	13	4	13-Oct-01	124.7	94.4		94.1		90.8	94.6	94.2	94.1	90.0	94.2
149.700	15	4	13-Oct-01	116.2										124.5
149.320	24	14	13-Jul-02	88.7							88.7	88.6		88.1

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.

[b] Could not code during flight. Location based on subsequent boat tracking.

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

Appendix D1 Continued.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2002									
					18-Jul [B]	19-Jul [B]	21-Jul [A]	22-Jul [A]	23-Jul [B]	24-Jul [B]	25-Jul [A]	27-Jul [GS]	28-Jul [GS]	30-Jul [GS]
149.700	1	4	15-Sep-01	67.0	73.3						74.0			
149.700	2	4	1-Oct-01	116.8	82.7	90.0					83.1			
149.700	3	4	23-Sep-01	114.9										
149.700	4	14	22-Sep-01	115.2	45.0	0.0	764.8 (FR)	769.9 (FR)	777 (FR)	778.9 (FR)	765.2 (FR)			
149.700	5	13	24-Sep-01	124.7							102.1			
149.700	6	3 [a]	13-Oct-01	124.7	29.3	28.4					28.6			
149.700	7	14	23-Sep-01	125.1							96.5			
149.700	8	4	28-Sep-01	116.2										
149.700	9	4	25-Sep-01	116.8										
149.700	10	4	29-Sep-01	115.1	87.5		90.0				104.2	90.0	90.0	
149.700	11	4	26-Sep-01	116.8							123.8			
149.700	12	4	1-Oct-01	115.2										
149.700	13	4	13-Oct-01	124.7	92.8						87.2			
149.700	15	4	13-Oct-01	116.2							132.3			
149.320	24	14	13-Jul-02	88.7	87.5						88.3			90.0

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.

[b] Could not code during flight. Location based on subsequent boat tracking.

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

Appendix D1 Continued.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2002									
					7-Aug [GS]	8-Aug [GS]	9-Aug [GS]	11-Aug [GS]	15-Aug [GS]	21-Aug [GS]	18-Sep [GS]	20-Sep [GS]	28-Sep [S]	9-Oct [S]
149.700	1	4	15-Sep-01	67.0										
149.700	2	4	1-Oct-01	116.8									116	116
149.700	3	4	23-Sep-01	114.9										
149.700	4	14	22-Sep-01	115.2										
149.700	5	13	24-Sep-01	124.7					90.0	90.0		90.0		116
149.700	6	3 [a]	13-Oct-01	124.7							90.0		116	116
149.700	7	14	23-Sep-01	125.1									116	116
149.700	8	4	28-Sep-01	116.2										
149.700	9	4	25-Sep-01	116.8										
149.700	10	4	29-Sep-01	115.1		90.0	90.0	90.0					116	116
149.700	11	4	26-Sep-01	116.8										
149.700	12	4	1-Oct-01	115.2										
149.700	13	4	13-Oct-01	124.7	90.0								116	116
149.700	15	4	13-Oct-01	116.2									116	116
149.320	24	14	13-Jul-02	88.7										116

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.

[b] Could not code during flight. Location based on subsequent boat tracking.

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

Appendix D1 Concluded.

Frequency	Code	Sex	Date of Release	Release Location (Km)	2002		2003		
					11-Oct [A]	5-Nov [S]	25-Feb [A]	2-Mar [A]	18-Mar [A]
149.700	1	4	15-Sep-01	67.0	67.5				
149.700	2	4	1-Oct-01	116.8	116	116	116		116
149.700	3	4	23-Sep-01	114.9					
149.700	4	14	22-Sep-01	115.2				674 (FR)	
149.700	5	13	24-Sep-01	124.7	116	116	116		116
149.700	6	3 [a]	13-Oct-01	124.7		116	116		
149.700	7	14	23-Sep-01	125.1		116			116
149.700	8	4	28-Sep-01	116.2					
149.700	9	4	25-Sep-01	116.8					
149.700	10	4	29-Sep-01	115.1	116	116	116		116
149.700	11	4	26-Sep-01	116.8					
149.700	12	4	1-Oct-01	115.2					
149.700	13	4	13-Oct-01	124.7		116	124.5		124.5
149.700	15	4	13-Oct-01	116.2	116	116	116		116
149.320	24	14	13-Jul-02	88.7					116

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] Sexual maturity not confirmed due to excessive fluid in ventral cavity observed during surgical examination.

[b] Could not code during flight. Location based on subsequent boat tracking.

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

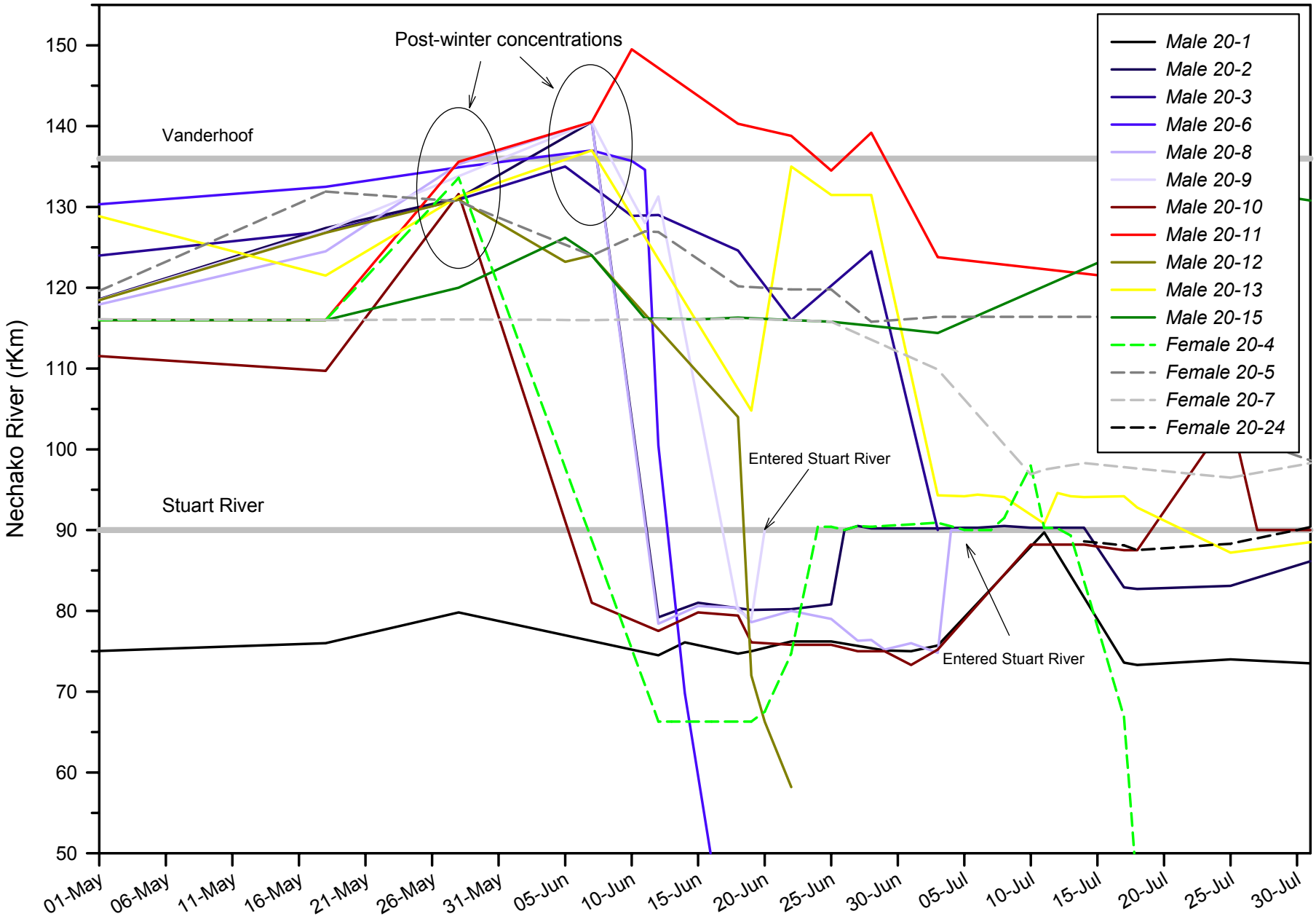

Figure D1 Movement data for all white sturgeon implanted with a radio transmitter in the Nechako River study area during the spring/summer spawning period, 2002.

APPENDIX E

DESCRIPTION OF MATURITY STATE CLASSIFICATIONS

Table E1 Descriptive summary of sexual maturity codes for white sturgeon sampled in the study area.

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 colored
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]Descriptions of maturity state classifications adapted from Conte et al. (1988).