## Nechako White Sturgeon Database Summary 2007

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## Prepared for:

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## Introduction

The Nechako population of white sturgeon (Acipenser transmontanus) has been ranked as a critically imperilled species in British Columbia (BC Conservation Data Centre 2006), as well as a species listed as endangered on Schedule 1 of the Species at Risk Act (SARA). Since 1994, data on white sturgeon within the upper Fraser and Nechako Rivers have been collected and entered into an Access database maintained by the Ministry of Environment (MoE). The database lists all records of sturgeon captures where physical data such as length, weight, sex, age and tagging information was collected, as well as telemetry data where individual fish movements have been recorded. Detailed information on hundreds of adult fish is included, many of which have been captured and tracked multiple times since 1994. This information is extremely valuable from a conservation standpoint since it provides a means of determining the timing of critical life history periods (ex. spawning), and identifying important rearing, spawning and overwintering habitats within the Nechako and Stuart Rivers. In addition, the comparison of data collected over the period of record provides a means of determining the rate of individual fish development and sexual maturity as well as examining how behaviour patterns change over time. This goal of the present study was to provide a summary of the life history information and movement data collected for each of the fish captured within the Nechako and Stuart Rivers. Interpretation of the movements of individual fish was included as well as any identified trends or potential critical habitats. This report summarizes the results of the database review and provides a discussion of how fish capture and telemetry locations change throughout the year.

## Methods

The database used for the completion of this study was dated March $6^{\text {th }}, 2008$ and includes all data collected through the summer of 2007. Data collected by the Carrier Sekani Tribal Council (CSTC) and Lheidli T'enneh First Nation in the fall of 2007 had not been entered into the database, however, summaries for individual fish were updated
to include this data. Queries of the database were developed and used to extract the data for this study based on the following criteria:

1. Only fish with Passive Integrated Transponder (PIT) tags were included as this was the only means of reliably identifying an individual fish.
2. Only data from fish captured in the Nechako or Stuart Rivers (including Stuart and Trembleur Lakes) were included. Data for fish captured in the Fraser River were not included with the exception of those fish originally captured in the Nechako/Stuart with subsequent records from the Fraser River.
3. All telemetry data (aerial, boat and ground basestation) for Nechako/Stuart fish (including records from the Fraser River) was included.

## Fish Summaries

Data summarized for each fish captured included the following:

- PIT tag number;
- Capture date;
- Capture location (river km);
- Sexual maturity (as determined during examination and based on classifications defined in Conte et al. 1988; see Appendix 1);
- Fork length (cm; measured from tip of snout to fork of tail);
- Total length (cm; measured form tip of snout to tip of tail);
- Age (as determined from ageing structures collected from captured fish); and
- Date of birth (estimated year of birth calculated by subtracting estimated age from year of capture).

In addition, any fish for which radio telemetry data existed had the following data summarized as well:

- Frequency of tag;
- Code of tag;
- Date of telemetry record;
- Location of record (river km);
- Telemetry station (aerial, boat, ground);
- River (Nechako, Stuart, Stuart Lake, or Trembleur Lake).

Graphical summaries of fish captures and telemetry locations over time were developed for those fish with more than two capture or telemetry records. The graphs displayed fish movement patterns and differentiated capture locations, Nechako River elemetry, and Stuart River telemetry over time. Since the bulk of the records are from the Nechako, specific geographical landmarks on the Nechako River were identified including: the Stuart River confluence ( km 89.7), km 116 overwintering location, Burrard Bridge (Vanderhoof spawning area, km 136), Braeside (km 162), and the Nautley River confluence (km 192). Data from the Stuart and Fraser Rivers was included and differentiated from Nechako Data by colour.

Lastly, a text summary in bullet form was provided for each fish which listed relevant additional information (e.g. known spawning history, brood stock fish, rated end of radio tag life) and provided interpretation of individual fish movements.

## Mapping

A series of overview maps of the Nechako and Stuart Rivers were produced that identify all capture and telemetry locations for which UTM coordinates exist. The data was separated into 4 periods based on life history activity:

- Overwintering - November to February
- Early spring rearing/feeding - March to April,
- Staging and Spawning - May to June, and
- Summer and fall rearing/feeding - July to October.

A separate map was developed for each time period in order to show how fish location changes over the year. An additional map was also developed showing all of the sample site locations (gill nets, setlines, angling and trapnet) within the study area including those where no fish were captured.

## Results

The query of the database identified a total of 303 fish that met the criteria outlined in the methods section. Of those fish, approximately half $(\mathrm{n}=155)$ had only one capture records and no telemetry data (i.e. had not been radio tagged). Summary data for each of these fish is provided in Appendix 2. Due to the lack of multiple records, graphs and text summaries were not developed for these fish.

The remaining 148 fish are those for which there is either data from a single capture along with telemetry data ( $\mathrm{n}=77$ ), or multiple captures with or without telemetry data ( n $=71)$. Summaries and graphs for each of these fish are provided in Appendix 3.

## Sexual Maturity

The majority of fish that were captured were assessed to determine sexual maturity. In the case of those fish with multiple captures, more than one assessment may have been completed. A total of 399 assessments have been completed on fish that met the criteria of this study and a histogram showing the breakdown for each maturity code is provided in Figure 1. A description of each maturity code is provided in Appendix 1.


Figure 1. Sexual maturity histogram for fish captured in the Nechako and Stuart systems $(\mathrm{n}=399)$.

The majority of the fish captured were male (codes 1-5; 43\%) followed by fish of unknown sex (code 97 adults or code 98 juveniles; 33\%). Females (code 11-20) represented the remaining $24 \%$ of the assessed fish. The high proportion of unknown sex adult sized fish (code 97) is a result of the physical similarities between the sexes and difficulty in differentiating the males from females when sex organs are not visible. In addition, identification of females is made more difficult by the relative infrequence of sexual maturity (estimated to be every 3-5 years vs. 2 years for males. In the case of both males and females, fish at the maturing stages (code 2 and 12 , respectively) have been most commonly encountered. This suggests that these age classes are most common in the population, which is reasonable, especially given that the fish will revert back to an early maturity level following spawning events. As a result, the same fish could be considered to be maturing at multiple times throughout its life. However, there are also several other potential explanations as to why these codes are most commonly encountered that could be biasing the dataset and should be considered. First, it is likely that fish at the maturing stages represent the period where testes and ovaries become
more obvious resulting in easier classification than code 1 or 11. Secondly, fish at these stages may be more likely to be found at those habitats where intensive sampling has been completed (e.g. km 116 and 125). Thirdly, fish at those stages of development may be more susceptible to being captured due to increased feeding activity and the type of sampling gear being employed.

## Year of Birth

A summary of the estimated year of birth for those fish included in the study for which aging data was available is provided in Figure 2.


Figure 2. Estimated year of birth histogram for fish captured in the Nechako and Stuart systems for which aging data is available $(\mathrm{n}=189)$.

The oldest fish included in the database is estimated to have been born in 1907 whereas the youngest was estimated to have been born in 1999. The majority of fish that have been captured are estimated to have been born between 1951 and 1965 (55\%). These results suggest that fish older than 100 years are likely either not present or very rare in
the study area. Similarly, fish born prior to 1935 and after 1981 have been infrequently encountered suggesting fish at the extremes of the age range are also rare. It should be noted, however, that the results will be biased by the sampling locations and techniques employed as well as the differences in behaviour that might exist between the age groups. For example, fish born between 1951 and 1965 are at an age that would be expected to be reproductively active and as a result will frequent the staging and rearing habitats within the river that have been most intensely sampled (e.g. km 116 and 125). Fish that are either older or younger are less likely to be tagged and therefore less well represented in the database. Therefore, while the results likely do describe the Nechako white sturgeon population to a certain extent, it is possible that more fish at the extremes of the age range do exist than figure 1 depicts. Sampling a wider range of habitats at different times of year may help produce a more accurate representation of the age range of fish in the system.

## Discussion

## Movement

Maps showing the capture and telemetry locations for all of the study fish at four different times of year are provided in Appendix 4. A histogram showing the percent of telemetry records identified within each 10 km section of the Nechako River (0-200 km) for each of the four periods is provided in Figure 3.

The results show that during each of the 4 periods, the majority of fish have been identified between km 80 and 140. This is partially due to the focus on this area during more recent (i.e. 2004-2007) telemetry programs and the presence of three permanent base stations in that section of the river (Stuart River confluence, km 116, and Burrard bridge). In addition, shed tags are more likely to be found in this area given the increased fish use. Both of these factors can bias the dataset making it seem like certain areas are more heavily used than others, or alternatively that other areas are less heavily used than they really are. Despite these potential biases the section of the river from km 80 to 140 has also been shown to contain critical overwintering and rearing habitat (km 110, 116,
and 125) as well as the only confirmed spawning habitat ( $\mathrm{km} 136-137$ ) in the river. As a result, it reasonable to expect that there will be greater usage of that section of river by sturgeon throughout the year.

Comparison of the results between the four times of year does identify some trends in the data. During the overwintering period (November to February) the majority of the records were located at known overwintering locations at km 116 and 125. Several records also exist for the section from km 130.1 to 137 and these are primarily the result of records from smaller potential overwintering locations in the vicinity of km 132 as well as several shed tags at km 135. Potential overwintering habitats also may exist in the vicinity of km 83-87 as several records from this area have been identified.

In March and April, the pattern is similar to that of November to February; however, a greater proportion of records area located at km 116 and 125. Based on this it appears that over the course of the winter many of the fish that were initially located at other rearing and overwintering locations move to the major overwintering locations, particularly km 116 , and remain there through early spring.

In May and June, there is an obvious dispersal of fish away from the overwintering habitats to rearing and spawning locations. This period, along with the July to October period, is also the time when fish are most likely to move outside of the region between km 80 and 140. During the July to October period there is also the greatest proportion of telemetry records were identified between km 80.1 and 90 . This is the location of the Stuart River confluence and many of the records at that location in late summer represent fish that have spawned and are returning to Stuart Lake.


Figure 3. Histogram showing the percent of total telemetry records identified at 10 km intervals for the Nechako River.

## Male vs. Female

Both males and females make use of the same key habitats in the river (ex. spawning area at km 136 , overwintering at $\mathrm{km} \mathrm{125}$,116 and 110) and exhibit similar movement patterns between them. Males tend to be more commonly captured, however, it is unclear whether that is due to behavioural differences and susceptibility to capture or a reflection of a disproportionate sex ratio. In the Kootenai River system, it has been observed that males show a tendency to migrate to the spawning area earlier than females by approximately a week and also remain longer following spawning event (Paragamian et al. 2002). This pattern has been observed in the Nechako with males and immature fish tending to move to spawning area earlier and remaining for longer than do females. However, both males and females also display relatively quick migrations to and from the spawning area and the entire spawning event tending to last only a couple of days. A more detailed comparison of male and female behavior may be able to identify behavioural differences between the sexes within the study area, however, the results of this analysis suggest that sexual maturity likely has more of an influence on white sturgeon behaviour than does sex.

## Sexual Maturity

For both males and females, sexual maturity does have substantial influence on movement patterns. In general, fish nearing sexual maturity (code 3 or 4 males and code 13 or 14 females) tend to show increased movement in the spring, some even migrating to and from the spawning area for several years in a row. The time it takes for these fish to mature (i.e. become code 5 or 15) can vary. For example, most male fish that are code 4 in the fall show behaviours that suggest they are ripe the following year (e.g. PIT tag 41247C4F74, Figure 4) but there are also examples of fish that take two years to reach maturity (e.g. PIT tag 4124714367). In general, males appear to spawn at two year intervals with a year spent at rearing/feeding habitats in between events. It is uncertain how long the biennial spawning pattern persists since in general the radio tags used by the NWSRI do not last more than 6 years. In the case of the fish in Figure 4, which appears to have spawned in 2002 and 2004, it was assessed as being immature (code 97)
in 2007 suggesting that over the course of 6 years the fish matured from code 4 , spawned twice and became immature. Continued tracking and assessment of fish such at this will provide information on whether or not the fish becomes sexually mature again and how long the process takes.


Figure 4. Example of timing of maturity and spawning in a code 4 male between Sept 2001 and Oct 2007.

In the case of females (code 14), the general trend is for fish that do not show spawning behaviours until the second year following assessment. For example, in the case of fish \#7F7B033622 (Figure 5), it was assessed as code 14 in Sept of 2005 but did not appear to spawn in 2006. In May of 2007 it was recaptured and assessed as code 15 and spawned that year. Based on these general trends, it is conceivable that the rate of achieving sexual maturity is an area where males and females could differ. Further research to define general patterns around the timing, duration and frequency of sexual maturity for each sex would be necessary to confirm this observation.


Figure 5. Example of a female fish that matured between Sept 2005 and May 2007.

The records in the database clearly show that once a fish reaches sexual maturity (code 5 males or code 15 females) it will move to the spawning area that spring, remain for a few days and then return to the rearing habitat locations. This pattern is generally reliable and occurs regardless of sex. However, environmental conditions within the river have been shown to influence the timing of spawning and there is the possibility that adverse conditions could delay or prevent spawning. A more detailed discussion of this is contained within the Adult White Sturgeon Monitoring - Nechako River 2007 report (Triton Environmental Consultants Ltd. 2007). There are also several instances in the database where fish that spawned in the spring moved downstream to the Stuart River and migrate into Stuart Lake in late summer (August/September). Due to the fact that white sturgeon do not generally spawn in subsequent years, Stuart Lake could provide rearing, feeding and overwintering habitat for many adults between spawning events. More detailed discussion on movements associated with Stuart Lake is provided in the next section.

Male and female fish that are still maturing (code 1 males; code 11 females) are not as well represented in the database potentially as a result of biases due to sampling location and gear or due to the fact that these maturity stages are hard to identify and could conceivable classed as code 97 (immature). In addition recent tagging programs have tended to focus on fish closer to reproductive maturity. As a result there is limited data available for these fish, particularly in regards to movement patterns. From the data is available, these fish generally show less extensive movement than mature fish but will make short migrations in the spring and summer presumably for rearing and feeding purposes. However, these fish do appear to respond to spawning cues and may show movements during the spawning period that include migrating to areas just outside of the spawning area or migrating to the spawning area after adults have left. The inclusion of these fish in future tagging programs would provide valuable information on immature fish behaviors and habitats.

## Key Habitats

Based on the analysis of fish movements included in the database, several key habitats within the Nechako and Stuart systems have been identified. Many of these are already known and have been the focus of intensive tagging and tracking programs in the past. However, there are indications of other habitats that may be important and that could warrant more detailed study to gather a more complete understanding of white sturgeon behavior and habitat use in the Nechako and Stuart systems.

## Nechako River

## Km 30-45

This section of the Nechako corresponds to the area where the Chilako River and other tributaries enter. Within the database there are a total of 8 fish ${ }^{1}$ that have shown direct migrations to this area during June and July (example PIT tag \#501F7A3051; Figure 6).

[^0]The time spent in this area is generally short with the fish usually returning to upstream rearing habitats by August. Due to the consistent timing of these migrations they are assumed to be associated with feeding and the availability of a particular food source. For example, chinook salmon smolts outmigrating, fish moving into or out of the Chilako River, or fish feeding on an invertebrate hatch in that area. A review of the sampling data shows that that section of river has never been sampled (see Appendix 4). As a result, monitoring of this area along with habitat surveys and sampling during June and July should help explain the observed migrations.


Figure 6. Showing the movement pattern for PIT tag \#501F7A3051 showing several migrations to km 3040 in June and July. These movements are presumably associated with feeding possibly in the Chilako River.

## $\underline{\text { Km 58-74 }}$

This section corresponds to Isle Pierre and is an area where fish have been captured in the past. Available telemetry data suggests it may be more likely to be used in the late summer/fall (July to October) and could provide suitable rearing and feeding habitat during that period. PIT tag \# 7F7D43767B (Figure 7) is an example of a fish that has been identified in the vicinity of km 70 several times suggesting the availability of summer feeding and/or rearing opportunities in this area. Habitat surveys and sampling
timed to correspond with telemetry data could result in useful data on preferred rearing habitat conditions.


Figure 7. Showing the movement pattern of PIT tag \# 7F7D43767B, which has made use of habitats in the vicinity of km 70 over several years.

## Km 75-85

Telemetry records suggest that this section of river is used in the late summer and fall potentially as rearing and feeding habitat. The presence of tagged fish in this area during the winter also suggests that potential overwintering habitat might exist, particularly in the vicinity of km 83 and 84 . Although sampling has been completed in the area, only a few fish have been captured. Habitat surveys and sampling timed to correspond with telemetry data could result in useful data on preferred rearing habitat conditions and may help identify other important overwintering locations.

## $\underline{\text { Km } 89.7 \text { - Stuart Confluence }}$

Due to fish regularly moving in and out of the Stuart River, this location is important for determining the timing of migrations between the Stuart and Nechako systems.

Telemetry data shows that the majority (78\%) of the records from the base station at the confluence of the Stuart River were collected between June and August. The remaining records were from September (14\%), May (3\%), April and October (2\%) and November $(1 \%)$. No records exist for the months of December-February. These results are consistent with the trend of fish being more active in the summer and being stationary through the winter. The continued collection of telemetry data from this location throughout the year will be beneficial to describing the general migration trends of the population.

## $\underline{K m 107}$

A narrowing of the river at this location results in a short section of riffle morphology downstream of which sturgeon have been identified throughout the spring and summer. The area likely provides rearing and feeding opportunities due to the slightly faster water velocities. Sampling has occurred at this location, however, no fish have been captured. Timing future sampling to correspond to telemetry data may result in more success. In addition, habitat surveys that correspond to the period when fish are present may provide information on habitat preferences.

## Km 110 - Keilor's Point

Telemetry and capture records identify this location as being important for overwintering and rearing since fish are typically identified at this location throughout the year. In the spring, fish will migrate from this location to the spawning area ( km 136 ) and it may also be used by fish migrating downstream towards the Stuart following spawning. As a result of the presence of fish all year round, this location must provide good feeding, rearing and overwintering opportunities.

## Km 116 and 125

These areas represent the primary rearing and overwintering habitats for sturgeon in the Nechako River. The majority of telemetry and capture records for the system are from these locations and both are used all year round. In the case of km 116 , this is the primary known overwintering site within the system. Fish of varying life stages are
found at this location throughout the year, however, the majority do leave the location in the spring and summer for spawning or feeding. By the end of summer and early fall many fish return to the location and remain throughout the winter. In the case of km 125 , fewer fish make use of this location throughout the winter than do km 116 , presumably due to it being a smaller, shallower hole. However, in the early spring, fish will migrate upstream to 125 from 116 possibly in preparation for spawning at km 136 . Both of these locations represent critical overwintering and rearing locations and continued monitoring of these areas will provide further information on movement patterns particularly around the spawning period.

## Km 129-134

Although fish do not appear to overwinter at these locations (presumably due to being too shallow), these areas are active in terms of telemetry records prior to and following spawning in the spring. Based on this it is assumed that these locations are staging areas for fish moving to and from the spawning area at km 136. Telemetry flights completed on subsequent days during the spawning period show fish moving upstream and downstream throughout this area on a daily basis.

## Km 136-137- Vanderhoof Spawning Area

This section is the only confirmed spawning area in the river. Congregations were observed in 2004 and 2006 (May $18^{\text {th }}$ and $19^{\text {th }}$, respectively) and eggs were collected in 2007 on June $2^{\text {nd }}$ and $8^{\text {th }}$ and in 2008 on June $2^{\text {nd }}$ and $9^{\text {th }}$. Continued monitoring will be necessary to confirm spawning and collect data to understand the environmental cues associated with spawning. Sampling for larvae post-spawning in this area will also provide the best opportunity to collect information on habitat preferences for that life stage.

Since the use of this area for spawning was not confirmed until 2004, telemetry surveys prior to that time did not focus on it during the spawning period. As a result, it is not possible to confirm the timing of spawning events for each year in the database. However, during the data review there was a subset of years for which telemetry records
for code 5 or 15 fish were available for this area making it possible to estimate the spawning window for those years.

- 1996 - PIT tag \# 7F7B0C5763 - assessed as code 4 in fall of 1995 and migrated to the spawning area between May $28^{\text {th }}$ and June $18^{\text {th }}$.
- 1997 - PIT tag \# 7F7B033622 - assessed as code 14 the previous fall and migrated upstream to km 132 on May $23^{\text {rd }}$. Tag appears to have been shed at that location so it cannot be confirmed that fish continued upstream to km 136-137. However, based on the fish's maturity, the time of year, and the fact that the upstream movements appeared purposeful, it seems likely the fish was moving to the spawning area.
- 2002 - PIT tags 4124680C7A, 41246D0D41, 4124741829, 41247C4F74, 412515071 A , and 501 F 7 A 3051 . These area all code 4 or 14 fish as assessed the previous fall that were identified in the vicinity of the spawning area between May $27^{\text {th }}$ and June $7^{\text {th }}$.
- 2003 - PIT tag \# 413B2F1C79 assessed as code 4 the previous fall and was identified in the vicinity of the spawning area on May $28^{\text {th }}$. In addition, fish were visually confirmed to be within the spawning area on May $26^{\text {th }}$ and $28^{\text {th }}$ (Pers. Comm. Cory Williamson, MOE).


## Km 140.5-141.5

Telemetry records show fish have been identified in this area during the potential spawning period (May - June) in at least four different years. In 1999 (tag \#7F7B0B1974), 2006 (tag \# 7F7D7C115E) and 2007 (tag \# 4528732143 and 452A2B4E5F) fish were identified at this location in May. The timing suggests the movements of these fish may have been spawning related however, they could have been staging upstream of the known spawning area at km 136-137 or migrating upstream to the potential spawning area at km 160. 2002 was the only year a group of fish was identified at this location and that occurred on June $7^{\text {th }}$ and included 4 fish: 41247C4F74, 412515071A, 4124741829 and 41246D0D41. It is unknown how long the fish remained at this bcation since telemetry was not completed on subsequent days however, by June $10^{\text {th }}-12^{\text {th }} 3$ of the 4 had been identified at downstream locations.

## Km 160-162 - Braeside

Telemetry records show fish in the vicinity of the Braeside boat launch (km 162) in several years during the spawning window. This includes 1999 (tag \# 7F7B0B1504), 2006 (tag \# 7F7D7C115E at km 164) and 2007. In 2007 a total of 5 fish were identified between June $3^{\text {rd }}$ and $5^{\text {th }}$, however, spawning was not confirmed (see Triton Environmental Consultants 2007 for discussion). Continued monitoring in future years will be necessary to determine whether or not spawning occurs in this area.

## Km 165-192-Nautley River Confluence

In general, few telemetry and capture records exist upstream of the Braeside boat launch. The map of sampled site locations shows that only the area around km 177 has been sampled and that at least one fish has been captured at that location. Telemetry records show that during the spring and summer, fish have been identified throughout the region, but at lower densities than downstream locations. However, this could be partially due to fewer telemetry surveys targeting the region. Upstream of the Nautley confluence, fish have been identified to km 197.

Another consideration is that all of the telemetry records reviewed in this study were from fish that were tagged downstream in the Nechako River and Stuart Lake. Due to the possibility that fish from Fraser Lake, which has not been extensively sampled and therefore have not been tagged, may be using this section of the Nechako in the same way that fish from Stuart Lake use the middle Nechako, the existing data may be under representing the overall importance of this area to the population. Habitat surveys of this area might help identify potential overwintering, rearing and spawning habitats while additional sampling within Fraser Lake and the Nechako upstream of Braeside may result in the capture of fish that do not utilize the same habitats as the Stuart Lake fish.

## Stuart River

Based on the telemetry and capture data from the Stuart River, it appears that the river itself may only provide limited white sturgeon habitat. While telemetry records show
that fish have been identified throughout the river in spring and summer, sampling has resulted in very few being captured. This suggests that the river may serve primarily as a migration corridor between the Nechako and Stuart Lake and fish are not spending a significant amount of time in the river itself. Anecdotal information of sturgeon captures from "Sturgeon Point" (estimated to be km 10 of the Stuart River) suggest this location may provide important overwintering and rearing opportunities. However, few actual capture and telemetry data points exist for this location therefore, it is difficult to determine its importance. The majority of telemetry records that do exist are from either km 104 (approximately $30 \%$ ), where a base station is located, or from the vicinity of km 48 (approximately $27 \%$ of records). On the map this section of the river has a tortuous meander and could provide rearing opportunities. The records are primarily from JuneAugust and very few winter telemetry records exist possibly suggesting minimal overwintering habitat is available in the Stuart River. Given the proximity to Stuart Lake, this may be a reasonable assumption however, in general telemetry surveys of the Stuart River are infrequent (particularly during the winter) which could bias the interpretation of the relative importance of the system.

## Stuart Lake

The data reviewed suggests that Stuart Lake provides important rearing habitat for the Nechako population of white sturgeon. There are many examples in the database of fish showing spawning behaviours in the Nechako at km 136-137 and then being identified in late summer by the telemetry basestation at km 104 in the Stuart River (approx 5 km downstream of Stuart Lake). These fish ${ }^{2}$ are presumably returning to Stuart Lake following spawning to feed and rear. Fish migrating out of Stuart Lake tend to do so 1 or 2 years prior to spawning suggesting that the final stages of sexual maturation are completed within the Nechako River. Sampling within Stuart Lake has been fairly extensive with the majority of captures occurring near the inlets and outlets of Tachie River and Stuart River, respectively.

[^1]
## Fraser River

In general, instances of Nechako fish moving into the Fraser River are rare. A total of 8 fish were identified that were originally captured in the Nechako with subsequent telemetry or capture records from the Fraser. Three of the fish were identified at telemetry the base station at km 2.3 of the Nechako in April - June of 2006 and it is assumed they moved into the Fraser but cannot be confirmed as no telemetry records within the Fraser for these fish exist. The fish are:

1. 4529141153 identified at the Nechako confluence June $15^{\text {th }}, 2006$ and was not identified again till August 5, 2007 at the Stuart confluence;
2. 452938611 B identified at Nechako confluence May $20^{\text {th }}$ and Sept $26^{\text {th }}, 2006$ possibly in the Fraser between those dates; and
3. 45296 A4B00 identified at the Nechako confluence on July $9^{\text {th }}, 2006$ and was not detected again till Sept $3^{\text {rd }}, 2007$ at the Stuart confluence.

An additional 3 fish have confirmed telemetry records from the Fraser River:

1. 4124680 C7A ( 149.700 code 4 ) has 7 records from the Fraser between July $21^{\text {st }}$, 2002 and May $26^{\text {th }}, 2003$. It has been identified at the following rkm: 652.1, 674, 764.9, 765, 769.9, 777, and 778.9.
2. 41250 F0A39 ( 149.700 code 12 ) has a single record from the Fraser on May 26, 2003 at rkm 772.3.
3. 7F7D77302F (149.500 code 9) has a single record from the Fraser on Sept. $5^{\text {th }}$, 1999 at rkm 826.6.

The remaining two fish were both captured in the Fraser in the fall of 2007 having been previously identified in the Nechako (tags 22236F2C51) and Nechako and Stuart (tag 7F7B031824). It should be noted that compared to the Nechako River, sampling and telemetry from the Fraser River has been minimal. Continued monitoring of the Nechako/Fraser confluence is necessary to determine the degree to which Nechako fish make use of the Fraser as well as define the time periods for when such movements occur.

## Conceptual Model

Following the review of the Nechako white sturgeon database several observations of behavior and life history patterns can be made which constitute a conceptual model of the Nechako population of white sturgeon. Due to the focus on adults in the database, the observations pertain primarily to that life stage. Recent and ongoing work by Steve McAdam (MOE) on the larval and juvenile stages will provide insight into the behaviors, habitat preferences and life history patterns of those age classes and will also provide direction for future studies. It should be noted that many of the observations are based on impressions and perceived trends in behaviour and should therefore not be interpreted to suggest that all fish in the population behave the same way or follow the same patterns.

Telemetry and capture results have identified several key habitat areas within the middle Nechako River. Overwintering locations at which fish have been identified all year round include km 110, 116 and 125. Data suggests fish tend to migrate to these locations in the fall and remain there through the early spring. Movement during the winter is difficult to assess due to the limited telemetry data however, the data that is available shows that fish do move to some degree. These movements could be associated with foraging or be the result of redistribution due to overcrowding or competitive exclusion of smaller size classes at the key areas. Habitat conditions at the overwintering locations that make them suitable include greater depth (as much as 10 m at $\mathrm{km} \mathrm{116)}$, ensures suitable space and limits the impact of ice cover and low dissolved oxygen. These locations are also depositional areas where food resources likely accumulated within the river. Lastly, the areas also tend to be located on bends or meanders where refuge areas (low velocities), back eddies, and variable currents are present.

The only confirmed spawning area within the system to date is located in the vicinity of the braided bird sanctuary area of Vanderhoof at km 136 (Burrard St. Bridge) to approximately km 137. Fish have been observed spawning within the braided bird sanctuary but eggs have been collected from upstream and downstream of the braided channel as well. The location of spawning may be velocity related and surveys completed by northwest hydraulic consultants in 2007 show that at higher discharges, the
higher velocity areas move upstream of the braided channel (northwest hydraulic consultants, 2008). Clean, gravel/cobble substrates seem to be targeted and the braided bird sanctuary area may provide refuge and rearing habitat for juveniles. The timing of spawning has been shown to be temperature dependent with a daily mean of approximately $13-14^{\circ} \mathrm{C}$ required for spawning to occur. However, prior to that threshold being achieved, fish tend to show increased movement in the spring, leaving the overwintering holes and distributing throughout the river. Males and juvenile fish tend to move to the spawning area up to a week or two before spawning, with females tending to migrate when the threshold has been achieved. The fish can remain in the spawning area for as short as 72 hours (Triton Environmental Consultants, 2004) to up to two weeks or more. However, it tends to be the males that remain with females leaving once spawning is complete. In 2008, eggs were collected on two separate occasions (July $2^{\text {nd }}$ and $9^{\text {th }}$, Triton Environmental Consultants 2008 in prep.) suggesting multiple spawning events are possible. Following spawning, fish tend to migrate downstream from the spawning area and remain dispersed throughout the river (as opposed to directly returning to the overwintering locations).

During the capture and assessment of adults in 2008 it was confirmed that males are capable of spawning every $2^{\text {nd }}$ year whereas females are likely on a 3-4 year cycle (Pers. Comm. Cory Williamson). Telemetry data suggests that following spawning some fish may move to Stuart Lake for a period of up to several years where they likely feed and rear. The lake environment is more productive than the riverine environment and likely provides greater rearing opportunities. This is especially true for females who expend a significant amount of energy in the production of eggs and therefore require a longer period of recover. Telemetry data shows that fish will migrate out of the lake and back to the Nechako during the summer where they overwinter and spawn the following spring.

The use of the Nechako upstream of Vanderhoof and downstream of the Stuart River confluence is less well understood. Telemetry data shows that fish do make use of these areas but to date no additional critical habitat areas (i.e. spawning and overwintering) have been identified. Suspected feeding areas in the vicinity of the Chilako River
confluence (km 33) may warrant future investigations as do a potential spawning area at Braeside (km 162) and potential rearing/overwintering locations upstream of Vanderhoof (such as km 146 and 175 for which winter telemetry records exist). In particular the area upstream of the Nautley confluence has had very limited data collected and therefore the relative importance of the upper Nechako is unknown. Anecdotal information suggests fish were previously identified in that area but that needs to be confirmed. Similarly the use of the Fraser River and its importance to the Nechako population is unknown. While telemetry and capture records of Nechako fish in the Fraser are limited, those that are present confirm that at least a subset of the population enters the Fraser. At this stage, the reason for the apparent limited usage of the Fraser is unknown. Fish that do make use of the Fraser may be genetically predisposed to do so, but further analysis would be needed to study this. In addition, the behavior or activity of fish once in the Fraser is unknown. Rearing and overwintering opportunities certainly exist and therefore fish could be making use of those habitats. Lastly, the role of Fraser Lake is also not well understood. Given the apparent importance of Stuart Lake as a rearing/overwintering location, it seems reasonable that Fraser Lake would fill a similar role. Fish within Fraser Lake may make use of the upper Nechako in a similar way that Stuart Lake fish make use of the middle Nechako River.

## Data Gaps

A review of the capture and telemetry data shows that substantial data exists between km 60 and 160 of the Nechako as well as within the Stuart River and Stuart Lake. Limited telemetry data exists for the Nechako between km 0 and 60 as well as upstream of km 160 , while little or no sampling has been completed in the same area. As a result, these areas represent the largest geographic data gaps in regards to white sturgeon usage. Another geographic data gap is the Tachie and Middle Rivers for which no telemetry and very limited sampling data exists. Since fish are known to occur in Trembleur and Stuart Lakes and may occur in Takla Lakes, telemetry of these rivers may provide information on the timing of migrations to and from lake habitats. Lastly, data from Fraser Lake and
the Nautley River is limited and therefore there is no information on the life history patterns of fish that might be making use of those habitats.

In regards to temporal data gaps, the majority of capture and telemetry records that exist are from the spring, summer and early fall and as a result, there is a data gap for the overwintering period. However, due to river and lake conditions during that period (i.e. ice cover) it is recognized that the capture of fish and collection of telemetry data from that period may not be the most efficient use of available funds.

## Recommendations

The following recommendations would address some of the data gaps outlined in the previous section:

- Continued operation and monitoring of telemetry base stations at key points along the migration routes. This includes at the confluences of the Nautley, Stuart and Nechako Rivers, the Vanderhoof spawning area and km 116 overwintering location.
- More regular extended aerial telemetry surveys of the lower and middle Nechako and upper Stuart systems in order to identify the timing and location of fish use.
- Additional sampling in those areas that have not previously sampled or where sampling was completed but not at the most opportune time of year. In particular, a focused program on Fraser Lake and the middle and upper Nechako would help address the question of whether or not there is a subset of the population that use those areas.
- Completion of habitat surveys for those areas identified as having the potential to provide rearing, spawning and overwintering habitats.
- Continued development and analysis of the database. In particular, there is sufficient data at present to complete additional analyses including determination of individual growth rates, length-at-age, and rate of sexual maturity.


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## Personal Communication:

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# Appendix 1. Summary table of sexual maturity codes for Nechako white sturgeon 

| Maturity Code | Sex | Description |
| :---: | :---: | :---: |
| 1 | Male | Non-reproductive, testes appear as thin strips with no pigmentation. |
| 2 | Male | Maturing; small testes, some folding may be apparent; translucent, smoky pigmentation. |
| 3 | Male | Early reproductive; large testes, folds beginning to form lobes; some pigmentation still present. Testes more white than cream coloured. |
| 4 | Male | Late reproductive; testes large, often filling posterior of body cavity; white with little or no pigmentation. |
| 5 | Male | Ripe; milt flowing; large white lobular testes; no pigmentation. |
| 6 | Male | Spent; testes pinkish-white, flaccid, and strongly lobed. |
| 10 | Male | General unknown maturity. |
| 11 | Female | Non-reproductive; ovaries small, folded with no visible oocytes; tissue color white to yellowish. |
| 12 | Female | Pre-vitellogenic, moderate size ovary with small eggs present ( 0.2 to 0.5 mm diameter) may have "salt and pepper" appearance. |
| 13 | Female | Early vitellogenic; large ovary varying in color from white to yellowish-cream to light grey; eggs 0.6 to 2.11 mm diameter. |
| 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. |
| 15 | Female | Ripe; eggs fully pigmented and easily detached from ovarian tissue; eggs 3.0 to 3.4 m in diameter. |
| 16 | Female | Spent; ovaries are flaccid with some residual eggs. |
| 17 | Female | Pre-vitellogenic with attritic oocytes; small eggs ( $<0.5 \mathrm{~mm}$ diameter) present; dark pigmented tissue present that may be reabsorbed eggs. |
| 20 | Female | General unknown maturity. |
| 97 | Unknown | Gonad not visible; juvenile based on size. |
| 98 | Unknown | Gonad not visible; adult based on size. |

* Description of maturity state classifications adapted from Conte et al. (1988).


# Appendix 2. Summary table of fish with a single capture record and no telemetry 

| PIT tag \# | Sex | River Km | River | Capture date | $\begin{gathered} \text { FL } \\ (\mathrm{cm}) \end{gathered}$ | $\begin{gathered} \mathrm{TL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{aligned} & \text { WT } \\ & (\mathbf{k g}) \end{aligned}$ | Age | Est. Birth year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2223420262 | 97 | 116.5 | Nechako River | 21/08/1995 | 148.5 | 168 | 28.6 | 45 | 1950 |
| 2223501D5C | 2 | 110.2 | Nechako River | 08/05/1997 | 181 | 202.5 | 51.3 | 59 | 1938 |
| 222372444 E | 3 | 61.1 | Nechako River | 10/05/1997 | 148.5 | 166 | 28.6 | 39 | 1958 |
| 22240A5FE3 | 2 | 124.5 | Nechako River | 19/05/2006 | 186 | 211 | 61 |  |  |
| 222414641F | 2 | 65.8 | Nechako River | 18/06/1997 | 135 | 152.5 | 19.1 | 45 | 1952 |
| 222419127A | 3 | 61.1 | $\begin{gathered} \hline \text { Nechako } \\ \text { River } \\ \hline \end{gathered}$ | 21/06/1997 | 199.5 | 222 |  | 67 | 1930 |
| 22363C3E0A | 14 | n/a | Trembleur Lake | 17/09/2004 | 226 | 260 |  | 48 | 1956 |
| 4124665E75 | 97 | 115.2 | Nechako River | 11/09/1999 | 148.5 | 167 | 20.4 | 36 | 1963 |
| 412466701E | 97 | 124.7 | Nechako River | 24/09/2001 | 141.5 | 155.5 | 17.252 |  |  |
| 4124667D61 | 12 | 116.2 | Nechako River | 10/09/1999 | 217 | 242.5 | 59.4 | 62 | 1937 |
| 4124671F3B | 97 | 107.6 | Nechako River | 12/09/1999 | 143.5 | 162.5 | 22.2 | 30 | 1969 |
| 4124687B73 | 97 | 116.8 | Nechako River | 25/09/2001 | 184 | 208 | 45.8 |  |  |
| 4124692877 | 3 | 110 | Nechako River | 12/09/1999 | 151.5 | 171 | 25.9 | 37 | 1962 |
| 4124697953 | 97 | 116.8 | Nechako River | 26/09/2001 | 158.5 | 181.5 | 34 |  |  |
| 41246B7817 | 97 | 92 | Nechako River | 05/08/1999 | 162 | 183 | 26.3 | 32 | 1967 |
| 41246C3057 | 3 | 107.9 | Nechako River | 12/09/1999 | 145 | 165 | 22.7 | 34 | 1965 |
| 41246D3805 | 97 | 125.1 | Nechako River | 24/09/2001 | 126 | 140.5 | 14.969 |  |  |
| 4124705139 | 97 | 90.1 | Nechako River | 05/08/1999 | 162 | 181 | 36.8 | 26 | 1973 |
| 4124707E71 | 97 | 107.6 | Nechako River | 12/09/1999 | 182 | 204 | 40.8 | 58 | 1941 |
| 4124711077 | 97 | 90.3 | Nechako River | 05/08/1999 | 156 | 176 | 23.2 | 38 | 1961 |
| 4124721004 | 97 | 110.1 | Nechako River | 12/09/1999 | 180.5 | 202 | 42.6 | 44 | 1955 |
| 412472662E | 97 | 115.2 | Nechako River | 03/10/2001 | 123.5 | 139.5 | 14.016 |  |  |
| 4124731A62 | 97 | 90.3 | Nechako River | 05/08/1999 | 200.5 | 223 | 64.5 | 38 | 1961 |
| 4124734300 | 98 | 124.7 | Nechako River | 23/09/2001 | 110 | 124 | 9.1 |  |  |
| 4124747221 | 2 | 124.6 | Nechako River | 10/09/1999 | 141.5 | 160.5 | 19.5 | 22 | 1977 |


| PIT tag \# | Sex | River Km | River | Capture date | $\begin{gathered} \text { FL } \\ (\mathrm{cm}) \end{gathered}$ | $\begin{gathered} \mathrm{TL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{gathered} \text { WT } \\ (\mathbf{k g}) \end{gathered}$ | Age | Est. <br> Birth <br> year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4124751461 | 97 | 115 | Nechako River | 11/09/1999 | 138.5 | 157 | 20 | 30 | 1969 |
| 4124777903 | 97 | 125 | Nechako River | 09/09/1999 | 142.5 | 160 | 20.4 | 34 | 1965 |
| 4124792E35 | 97 | 107.6 | Nechako River | 12/09/1999 | 132.5 | 151 | 18.1 | 36 | 1963 |
| 41247A086B | 97 | 116.2 | Nechako River | 24/09/2001 | 138.5 | 156 | 19.522 |  |  |
| 41247A221A | 3 | 114.9 | Nechako River | 26/09/2001 | 187 | 213 | 50.8 |  |  |
| 41247A5430 | 3 | 116.2 | Nechako River | 25/09/2001 | 164.5 | 187.5 | 31.3 |  |  |
| 41247B7427 | 3 | 116.2 | Nechako River | 21/09/2001 | 188 | 211.5 | 49.03 |  |  |
| 41247D0448 | 3 | 114.9 | Nechako River | 22/09/2001 | 115.5 | 173.5 | 25.855 |  |  |
| 41247D310C | 97 | 91.4 | Nechako River | 05/08/1999 | 133 | 151.5 | 16.8 | 22 | 1977 |
| 41247F0738 | 97 | 92 | Nechako River | 05/08/1999 | 168.5 | 193 | 33.1 | 35 | 1964 |
| 412500497 F | 97 | 116.2 | Nechako River | 02/10/2001 | 145.5 | 166.5 | 20.9 |  |  |
| 4125005E0C | 97 | 116.2 | Nechako River | 11/09/1999 | 179 | 200 | 40.8 | 43 | 1956 |
| 4125010F3C | 12 | 125 | Nechako River | 09/09/1999 | 166.5 | 187.5 | 33.1 | 38 | 1961 |
| 4125034473 | 98 | 125.2 | Nechako River | 26/09/2001 |  |  | 12 |  |  |
| 412504440C | 97 | 116.8 | Nechako River | 28/09/2001 | 151.5 | 169 | 26.3 |  |  |
| 4125062840 | 97 | 110 | Nechako River | 12/09/1999 | 153.5 | 173 | 24.5 | 42 | 1957 |
| 41250F5929 | 97 | 124.7 | Nechako River | 24/09/2001 | 166 | 186 | 35.412 |  |  |
| 412510146B | 12 | 115.2 | Nechako River | 22/09/2001 | 161 | 182.5 | 30.844 |  |  |
| 4125131B53 | 97 | 116.8 | Nechako River | 28/09/2001 | 156.5 | 176.5 | 26.3 |  |  |
| 412513715B | 97 | 124.7 | Nechako River | 02/10/2001 | 158 | 181.5 | 31.3 |  |  |
| 4138686B7D | 97 | 116.2 | Nechako River | 13/10/2001 | 198 | 224 | 52.6 |  |  |
| 41390D643C | 3 | 67.4 | Nechako River | 14/09/1999 | 140.5 | 160 | 20.4 | 37 | 1962 |
| 413913523F | 97 | 115.2 | Nechako River | 26/09/2001 | 138.5 | 154 | 17.7 |  |  |
| 4139256371 | 97 | 107.9 | Nechako River | 12/09/1999 | 122.5 | 140.5 | 14.1 | 29 | 1970 |
| 41392A0951 | 12 | 68.3 | Nechako River | 12/10/2001 | 171.5 | 189 | 37.6 |  |  |
| 4139333903 | 3 | 67.4 | Nechako River | 14/09/1999 | 160 | 180 | 29.5 | 38 | 1961 |


| PIT tag \# | Sex | River $\mathbf{K m}$ | River | Capture date | $\begin{gathered} \mathrm{FL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{gathered} \mathrm{TL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{gathered} \text { WT } \\ (\mathbf{k g}) \end{gathered}$ | Age | Est. Birth year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4139522777 | 97 | 116.8 | Nechako River | 05/10/2001 | 154.5 | 169.5 | 25.855 |  |  |
| 4139666A06 | 97 | 66.3 | Nechako River | 14/09/1999 | 143 | 162 | 19.6 | 35 | 1964 |
| 413B106468 | 13 | 0.3 | Nechako River | 14/07/2002 | 180 | 206 | 50.4 |  |  |
| 41424B7273 | 97 | 114.9 | Nechako River | 26/09/2001 | 125.5 | 140.5 | 13.1 |  |  |
| 41493F7C14 | 98 | 124.6 | Nechako River | 09/09/1999 | 84 | 97 | 4.1 | 9 | 1990 |
| 41497E087F | 97 | 125.2 | Nechako River | 28/09/2001 | 141 | 156.5 | 19.5 |  |  |
| 420E616F33 | 97 | 91.4 | Nechako River | 05/08/1999 | 160.5 | 181.5 | 26.3 | 36 | 1963 |
| 422E2A6E26 | 98 | 115.9 | Nechako River | 31/08/2006 | 104.5 | 121 | 7.27 |  |  |
| 422E311002 | 97 | 0 | Stuart <br> Lake | 13/08/2004 | 175 | 197 | 37.5 | 31 | 1973 |
| 422E415376 | 98 | 0 | Nechako River | 29/08/2004 | 51.5 | 59 | 5.897 | 8 | 1996 |
| 422E42571F | 98 | 116 | Nechako River | 28/09/2005 | 102 | 118 | 6.3 |  |  |
| 422E44015D | 98 | 91.3 | Nechako River | 03/09/2005 | 62.5 | 70.5 | 1.51 |  |  |
| 422E616706 | 98 | 116.5 | Nechako River | 31/08/2006 | 79 | 89.5 | 3.06 |  |  |
| 423C1A2D62 | 4 | 125 | Nechako River | 14/05/2007 | 187 | 207 | 55 |  |  |
| 423C1B2E61 | 98 | 124.6 | Nechako River | 18/10/2006 | 71.5 | 81.6 | 1.905 |  |  |
| 423C1F424B | 3 | 124.9 | Nechako River | 09/05/2007 | 199 | 224 | 57.3 |  |  |
| 424D772278 | 98 | 0.3 | Nechako River | 21/07/2001 | 87 | 99.5 | 3.645 | 15 | 1986 |
| 424E087403 | 98 | 0 | Nechako River | 27/07/2004 | 66 | 74 | 1.882 | 9 | 1995 |
| 424E0B7403 | 98 | 116 | Nechako River | 28/09/2005 | 70 | 78.5 | 1.91 |  |  |
| 424E6E1700 | 98 | 0 | Nechako River | 27/07/2004 | 74 | 86.5 | 2.552 | 5 | 1999 |
| 424E707876 | 98 | 116.4 | Nechako River | 31/08/2006 | 65.5 | 74.5 | 1.824 |  |  |
| 424E707E4F | 6 | 0 | Stuart Lake | 09/09/2004 | 183 | 210 | 42.857 | 47 | 1957 |
| 451D364D58 | 5 | 129 | Nechako River | 12/05/2007 | 215 | 235 | 77.3 |  |  |
| 45227F1A49 | 98 | 110 | Nechako River | 15/05/2007 | 87.5 | 98.5 | 4.5 |  |  |
| 4523051833 | 97 | 116.2 | Nechako River | 18/09/2005 | 193 | 215.5 | 57.2 |  |  |
| 4523285E3C | 12 | 125.1 | Nechako River | 16/05/2006 | 164 | 188 | 35 |  |  |


| PIT tag \# | Sex | River $\mathbf{K m}$ | River | Capture date | $\begin{gathered} \text { FL } \\ (\mathrm{cm}) \end{gathered}$ | $\begin{gathered} \mathrm{TL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{gathered} \text { WT } \\ (\mathbf{k g}) \end{gathered}$ | Age | Est. Birth year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4525006927 | 97 | 115.3 | Nechako River | 17/09/2005 | 153 | 172 | 24.9 |  |  |
| 452711542A | 4 | 132.1 | $\begin{aligned} & \hline \text { Nechako } \\ & \text { River } \\ & \hline \end{aligned}$ | 11/05/2006 | 181 | 205 | 48 |  |  |
| 4527132936 | 98 | 110 | Nechako River | 13/05/2007 | 93 | 106 | 5 |  |  |
| 4527246A5C | 2 | 120.7 | Nechako River | 15/05/2007 | 206 | 231 | 61.4 |  |  |
| 4527276447 | 2 | 124.5 | $\begin{aligned} & \text { Nechako } \\ & \text { River } \end{aligned}$ | 09/05/2007 | 201 | 230 | 91.4 |  |  |
| 45275F7763 | 2 | 110 | Nechako River | 15/05/2007 | 145 | 164 | 21.8 |  |  |
| 452761656E | 97 | 115.3 | Nechako River | 19/09/2005 | 109.5 | 127.5 | 8.4 |  |  |
| 4527666B79 | 97 | 117.3 | Nechako River | 19/09/2005 | 116.5 | 133.5 | 9.4 |  |  |
| 4528342369 | 3 | 129.3 | Nechako River | 14/05/2006 | 160 | 178 | 37 |  |  |
| 4528404012 | 98 | 116.9 | $\begin{aligned} & \text { Nechako } \\ & \text { River } \\ & \hline \end{aligned}$ | 31/08/2006 | 35.5 | 41 | 0.242 |  |  |
| 4528477E78 | 97 | 110 | Nechako River | 16/05/2007 | 192 | 220 | 47.3 |  |  |
| 45285F5E40 | 98 | 114.9 | Nechako River | 18/09/2005 | 74 | 83 | 2.7 |  |  |
| 4529173846 | 2 | 132.1 | $\begin{aligned} & \text { Nechako } \\ & \text { River } \\ & \hline \end{aligned}$ | 16/05/2006 | 172 | 192 | 41 |  |  |
| 4529413820 | 3 | 124.5 | $\begin{aligned} & \hline \text { Nechako } \\ & \text { River } \end{aligned}$ | 12/05/2006 | 165 | 192 | 91 |  |  |
| 4529443547 | 98 | 115.3 | Nechako River | 18/09/2005 | 97 | 114 | 5.9 |  |  |
| 452A03165E | 12 | 124.5 | Nechako River | 09/05/2007 | 148 | 170 | 34.1 |  |  |
| 452B05415B | 98 | 110.1 | Nechako River | 12/05/2007 | 78 | 92 | 3.3 |  |  |
| 501F651016 | 97 | 116.1 | Nechako River | 27/09/2005 | 94 | 107.5 | 31.3 |  |  |
| 501F6B1604 | 97 | 0.4 | Nechako River | 15/07/2000 | 140 | 158.5 | 18.225 | 36 | 1964 |
| 501F70364F | 97 | 0 | Stuart Lake | 03/09/2004 | 201 | 226 | 44.196 | na |  |
| 501F703F2A | 97 | 0.4 | Nechako River | 15/07/2000 | 122.5 | 138.5 | 15.075 | 22 | 1978 |
| 501F770257 | 97 | 0 | Trembleur Lake | 19/09/2004 | 154 | 175 |  | 34 | 1970 |
| 5020135414 | 98 | 110.1 | $\begin{aligned} & \text { Nechako } \\ & \text { River } \\ & \hline \end{aligned}$ | 01/09/2006 | 33 | 38.5 | 0.2 |  |  |
| 50201F5930 | 97 | 0.4 | Nechako River | 15/07/2000 | 192 | 215 | 58.5 | 45 | 1955 |
| 50283B403A | 97 | 0.4 | Nechako River | 15/07/2000 | 140 | 165 | 24.3 | 19 | 1981 |
| 5027275953 | 98 | 116 | Nechako River | 28/09/2005 | 95.5 | 110 | 4.7 |  |  |


| PIT tag \# | Sex | River Km | River | Capture date | $\begin{gathered} \text { FL } \\ (\mathrm{cm}) \end{gathered}$ | $\begin{gathered} \mathrm{TL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{gathered} \text { WT } \\ (\mathbf{k g}) \end{gathered}$ | Age | Est. Birth year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F70781E6C | 2 | 124.9 | Nechako River | 05/09/1998 | 143 | 160 | 20 | 39 | 1959 |
| 7F7B02741B | 10 | 111.2 | Nechako River | 01/09/1998 | 179 | 199 | 37.7 | 54 | 1944 |
| 7F7B027C16 | 2 | 125 | Nechako River | 16/09/1995 | 156.5 | 177 | 34.958 | 39 | 1956 |
| 7F7B027D67 | 2 | 108 | Nechako River | 01/09/1998 | 147 | 162 | 20.4 | 37 | 1961 |
| 7F7B031021 | 12 | 124.7 | Nechako River | 07/09/1998 | 129.5 | 149.5 | 15.4 | 34 | 1964 |
| 7F7B03124E | 2 | 111.2 | Nechako River | 01/09/1998 | 131 | 146.5 | 15 | 32 | 1966 |
| 7F7B031D1B | 98 | 132.1 | Nechako River | 06/09/1996 | 69 | 82 | 2.7 | 11 | 1985 |
| 7F7B032A30 | 12 | 114.9 | Nechako River | 16/09/1995 | 175 | 197 | 41.768 | 48 | 1947 |
| 7F7B03326A | 2 | 124.9 | Nechako River | 07/09/1998 | 129 | 144 | 12.3 | 22 | 1976 |
| 7F7B0B1452 | 12 | 124.9 | Nechako River | 16/09/1995 | 144 | 165 | 24.062 | 34 | 1961 |
| 7F7B0B1458 | 2 | 91.5 | Nechako River | 23/06/1996 | 120.5 | 138.5 | 15.4 | 25 | 1971 |
| 7F7B0B1B59 | 12 | 124.9 | Nechako River | 05/09/1998 | 126.5 | 143 | 12.3 | 36 | 1962 |
| 7F7B0B1B5C | 98 | 90.2 | Nechako River | 10/06/1995 | 114.5 | 130 | 10.432 | 18 | 1977 |
| 7F7B0B1C28 | 2 | 124.5 | Nechako River | 15/09/1995 | 143.5 | 159.5 | 20.884 | 36 | 1959 |
| 7F7B0B2861 | 2 | 124.9 | Nechako River | 17/09/1997 | 136 | 155.5 | 23.2 | 41 | 1956 |
| 7F7B0C1874 | 97 | 92.4 | Nechako River | 17/06/1995 | 181 | 205.5 | 39.462 | 57 | 1938 |
| 7F7B0C2938 | 97 | 116.2 | Nechako River | 22/06/1998 | 147.5 | 168.5 | 20 | 35 | 1963 |
| 7F7B0C4A4D | 12 | 116.2 | Nechako River | 15/09/1995 | 181 | 204 | 50.394 | 57 | 1938 |
| 7F7B0C4D3B | 2 | 110.2 | Nechako River | 20/06/1996 | 147 | 165 | 23.6 | 35 | 1961 |
| 7F7B0C4E27 | 3 | 125.1 | Nechako River | 06/09/1998 | 172.5 | 191.5 | 34.5 | 35 | 1963 |
| 7F7B0C540B | 2 | 116.2 | Nechako River | 15/09/1995 | 167 | 191 | 47.216 | 37 | 1958 |
| 7F7B0C5B7A | 2 | 116.5 | Nechako River | 08/09/1996 | 171.5 | 192.5 | 37.23 | 57 | 1939 |
| 7F7B0C6B60 | 2 | 91.5 | Nechako River | 12/09/1996 | 162.5 | 187 | 39.1 | 40 | 1956 |
| 7F7D4F4130 | 13 | 110.2 | Nechako River | 21/06/1996 | 187 | 209 | 59.474 | 43 | 1953 |
| 7F7D4FS21A | 97 | 116.2 | Nechako River | 25/09/2001 | 139 | 154 | 18.6 |  |  |
| 7F7D52086E | 12 | 93 | Nechako River | 23/06/1996 | 127 | 143.5 | 15.9 | 30 | 1966 |


| PIT tag \# | Sex | River Km | River | Capture date | $\begin{gathered} \text { FL } \\ (\mathrm{cm}) \end{gathered}$ | $\begin{gathered} \mathrm{TL} \\ (\mathrm{~cm}) \end{gathered}$ | $\begin{gathered} \text { WT } \\ (\mathbf{k g}) \end{gathered}$ | Age | Est. Birth year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7D571949 | 98 | 116.2 | Nechako River | 18/09/1997 | 126.5 | 145 | 16.8 | 32 | 1965 |
| 7F7D572F22 | 11 | 124.9 | Nechako River | 07/09/1998 | 132 | 149 | 15.9 | 26 | 1972 |
| 7F7D767322 | 2 | 92.4 | Nechako River | 10/06/1995 | 123 | 138.5 | 15.649 | 35 | 1960 |
| 7F7D770D5C | 3 | 90.1 | Nechako River | 13/09/1997 | 139 | 158 | 22.7 | 41 | 1956 |
| 7F7D772A5C | 2 | 111.2 | Nechako River | 01/09/1998 | 174 | 192.5 | 39.5 | 45 | 1953 |
| 7F7D773228 | 2 | 96.4 | Nechako River | 24/06/1996 | 120.5 | 139 | 15.4 | 26 | 1970 |
| 7F7D775B04 | 3 | 124.9 | Nechako River | 06/09/1998 | 138.5 | 159 | 20 | 33 | 1965 |
| 7F7D781103 | 2 | 117.2 | Nechako River | 08/09/1996 | 126 | 141.5 | 16.8 | 31 | 1965 |
| 7F7D781C3B | 2 | 124.7 | Nechako River | 07/09/1998 | 151 | 173 | 26.8 | 46 | 1952 |
| 7F7D7A3278 | 12 | 110.2 | Nechako River | 20/06/1996 | 134 | 152 | 22.7 | 33 | 1963 |
| 7F7D7A3C1F | 12 | 124.7 | Nechako River | 15/09/1995 | 125 | 140.5 | 15.436 | 32 | 1963 |
| 7F7D7A4003 | 3 | 39.9 | Stuart <br> River | 23/09/1997 | 150 | 168.5 | 26.8 | 45 | 1952 |
| 7F7D7A4F0D | 12 | 117.3 | Nechako River | 03/09/1998 | 168 | 189 | 36.3 | 40 | 1958 |
| 7F7D7B182D | 12 | 110.1 | Nechako River | 20/06/1996 | 154 | 174.5 | 29.1 | 44 | 1952 |
| 7F7D7C6666 | 12 | 90.2 | Nechako River | 22/06/1996 | 132 | 148.5 | 17.7 | 32 | 1964 |
| 7F7D7D2A27 | 2 | 76 | Nechako River | 13/06/1998 | 130 | 147.5 | 16.798 | 35 | 1963 |
| 7F7D7D2A42 | 12 | 124.9 | Nechako River | 07/09/1998 | 139.5 | 156 | 16.3 | 24 | 1974 |
| 7F7D7D2D24 | 2 | 109.2 | Nechako River | 01/09/1998 | 162.5 | 184 | 35 | 36 | 1962 |
| 7F7D7D2E0E | 1 | 109.4 | Nechako River | 10/09/1996 | 135 | 153 | 23.2 | 31 | 1965 |
| 7F7D7D373D | 2 | 125.1 | Nechako River | 15/09/1995 | 138.5 | 157 | 18.614 | 19 | 1976 |
| 7F7D7D4311 | 3 | 125.1 | Nechako River | 06/09/1998 | 131 | 149.5 | 15.9 | 32 | 1966 |
| 7F7D7D4335 | 98 | 91.5 | Nechako River | 11/06/1995 | 96.5 | 109 | 5.443 | 16 | 1979 |
| 7F7D7D5141 | 12 | 116.8 | Nechako River | 04/09/1998 | 181 | 205 | 51.8 | 45 | 1953 |
| 7F7D7D5815 | 98 | 66.3 | Nechako River | 11/06/1998 | 130 | 149.5 | 17.706 | 36 | 1962 |
| 7F7D7D5904 | 2 | 116.2 | Nechako River | 07/09/1996 | 151.5 | 172.5 | 29.06 | 37 | 1959 |
| 7F7D7D6601 | 2 | 116.2 | Nechako River | 29/09/1997 | 138 | 157 | 18.2 | 36 | 1961 |

# Appendix 3. Capture and telemetry summaries 

Note: Records are in ascending order based on PIT tag number.


- Tagged and assessed at km 129 in May 1997. Assessed as code 4 male suggesting fish could have been sexually mature (code 5) in 1998.
- Following tagging fish migrated upstream to km 132 on May $23^{\text {rd }}$ and possibly could have been responding to spawning cues.
- Tag likely shed at km 132.

- Fish was never identified at the known spawning area at VH.
- The single telemetry record from km 15.2 (Nov $17^{\text {th }}, 1997$ ) may be a data entry area as all subsequent records are from km 116.2.
- Tag likely was shed at km 116.
- Fish was captured on Sept $30^{\text {th }}, 2007$ in the Fraser River (10.588477.5978821). Maturity code 3 and fish was radio tagged (148.420 code 51).

- Fish captured at km 91.5 in May 1997. Assessed as code 12 female
- Tag likely shed at km 92 .


- From May 1997 to July 1999, fish was only identified in vicinity of km 77 with no apparent migrations from that location. It is likely that the tag was shed in that area. The fish was assessed as code 14 in October of 1997 suggesting that it may have been sexually mature and spawned the following year. Assuming the tag was not shed, spawning would potentially have occurred around km 77 .
- In 2007, the fish was assessed as being ripe (code 15). During the period were eggs were collected at VH (June $2^{\text {nd }}-8^{\text {th }}$ ), the fish was located at km 160 (Braeside, June $1-3^{\text {rd }}$ ) but migrated downstream to VH on June $4{ }^{\text {th }}$. However, on the same date it was identified at km 89 (Stuart River confluence) suggesting it did not stop at the VH spawning area.
- The 2007 results suggest this fish may have spawned at Braeside.

PITtag
22240A5F63

Capture Date River Km Sex FL (cm) TL (cm) WT (kg) Age Birth Year $\begin{array}{llllllll}21 / 08 / 1995 & 116.5 & 97 & 152 & 173.5 & 33.14 & 39 & 1956\end{array}$
18/09/1997 $116.9 \quad 12$
22/06/1998 116.2

| $11 / 05 / 2006$ | 125 |
| :--- | :--- |


| $11 / 05 / 2006$ | 125 | 2 |
| :---: | :---: | :---: |
| $15 / 05 / 2007$ | 120.7 | 2 |



- Fish was originally assessed as a code 12 female (1997 \& 1998), however subsequent assessments in 2006 and 2007 have identified it as a male (code 2).
- Fish has not been radio tagged and has been captured at either km 116 ( 3 times) or 125 ( 2 times).

- Fish originally captured at km 65.8 in June, suggesting rearing habitat in that area.
- Following re-capture in May 2006 (code 13) fish migrated to km 116 (end of May) then to km 89.7 (Stuart River confluence; July to mid-August).
- In 2007, fish was quite active but was not identified at either the known VH spawning area ( km 137 ) or the potential secondary site at Braeside ( km 162 ).

Movements likely associated with feeding/rearing migrations but may also suggest fish is maturing.

- Based on fish being a code 13 in 2006, there is the potential that it will be mature and ready to spawn in 2008.
- Rated end of tag life is December 2010.

- Fish captured at km 115 in Sept 2001 and assessed as code 14 suggesting it was nearly ready to spawn.
- Telemetry data from 2002 showed the fish migrated to the known VH spawning area on May $28^{\text {th }}$, which would coincide with the timing of spawning
events observed in later years.
- Following spawning, fish migrated to km 66 and 90 presumably for rearing/feeding (summer 2002).
- Last record (July $18^{\text {th }}, 2002$ ) identified the fish at km 45 , which is an area several fish have migrated to in late summer suggesting feeding opportunities.
- From June $21^{\text {st }} 2002$ to May $26^{\text {th }}, 2003$ fish was identified in the Fraser River between km 652 and 778 .

| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4124684A2D |  | $\begin{aligned} & 21 / 09 / 2001 \\ & 17 / 09 / 2005 \end{aligned}$ | $\begin{aligned} & 116.2 \\ & 115.3 \end{aligned}$ | $\begin{aligned} & 97 \\ & 12 \end{aligned}$ | $\begin{gathered} 149.5 \\ 163 \end{gathered}$ | $\begin{aligned} & 167.5 \\ & 182.5 \end{aligned}$ | $\begin{gathered} 21.36 \\ 28.1 \end{gathered}$ |  |  |
| PITtag |  | Capture Date | River Km | Sex | FL (cm) | $T L$ (cm) | WT (kg) | Age | Birth Year |
| 412469273C |  | $\begin{aligned} & 11 / 09 / 1999 \\ & 17 / 05 / 2006 \end{aligned}$ | $\begin{gathered} 116.2 \\ 0 \end{gathered}$ | $\begin{aligned} & 97 \\ & 13 \end{aligned}$ | $\begin{aligned} & 153 \\ & 169 \end{aligned}$ | $\begin{aligned} & 169 \\ & 189 \end{aligned}$ | $\begin{aligned} & 24 \\ & 39 \end{aligned}$ | 37 | 1962 |
| PITtag |  | Capture Date | River Km | Sex | $\boldsymbol{F L}$ (cm) | $T L$ (cm) | WT (kg) | Age | Birth Year |
| 41246D0D41 |  | 26/09/2001 | 116.8 | 4 | 228 | 254 | 95.2 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 149.700 | 11 | 26-Sep-01 | 116.8 | S | NECHAKO | RIVER |  |  |  |
| 149.700 | 11 | 10-Nov-01 | 116 | A |  |  |  |  |  |
| 149.700 | 11 | 06-Feb-02 | 116 | A |  |  |  |  |  |
| 149.700 | 11 | 14-Apr-02 | 116.3 | S |  |  |  |  |  |
| 149.700 | 11 | 26-Apr-02 | 116 | A |  |  |  |  |  |
| 149.700 | 11 | 18-May-02 | 116 | A |  |  |  |  |  |
| 149.700 | 11 | 28-May-02 | 135.6 | A |  |  |  |  |  |
| 149.700 | 11 | 07-Jun-02 | 140.5 | A |  |  |  |  |  |
| 149.700 | 11 | 10-Jun-02 | 149.5 | B |  |  |  |  |  |
| 149.700 | 11 | 18-Jun-02 | 140.3 | A |  |  |  |  |  |
| 149.700 | 11 | 22-Jun-02 | 138.8 | A |  |  |  |  |  |
| 149.700 | 11 | 25-Jun-02 | 134.5 | GS |  |  |  |  |  |
| 149.700 | 11 | 25-Jun-02 | 134.5 | A |  |  |  |  |  |
| 149.700 | 11 | 28-Jun-02 | 139.2 | A |  |  |  |  |  |
| 149.700 | 11 | 03-Jul-02 | 123.8 | B |  |  |  |  |  |
| 149.700 | 11 | 17-Jul-02 | 121.2 | A |  |  |  |  |  |
| 149.700 | 11 | 25-Jul-02 | 123.8 | A |  |  |  |  |  |
| 149.700 | 11 | 05-Jun-04 | 136 | GS |  |  |  |  |  |
| 149.700 | 11 | 10-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 11-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 12-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 14-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 15-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 16-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 20-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 21-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 23-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 24-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 25-Jun-04 | 116 | GS |  |  |  |  |  |
| 149.700 | 11 | 26-Jun-04 | 116 | GS |  |  |  |  |  |


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 11 | 27-Jun-04 | 116 | GS |  |
| 149.700 | 11 | 28-Jun-04 | 116 | GS |  |
| 149.700 | 11 | 08-Jul-04 | 116 | GS |  |
| 149.700 | 11 | 09-Jul-04 | 116 | GS |  |
| 149.700 | 11 | 10-Jul-04 | 116 | GS |  |
| 149.700 | 11 | 11-Jul-04 | 116 | GS |  |
| 149.700 | 11 | 14-Jul-04 | 116 | GS |  |
| 149.700 | 11 | 05-Jul-05 | 116 | GS |  |
| 149.700 | 11 | 06-Jul-05 | 116 | GS |  |
| 149.700 | 11 | 07-Jul-05 | 116 | GS |  |

- Captured at km 116 in Sept 2001 and assessed as code 4 suggesting the fish would spawn the following year.
- Telemetry data shows it migrated to the VH spawning area on May $28^{\text {th }}$ and remained in the general area until July $3^{\text {rd }}$
- Was not identified in 2003.
- In 2004 was identified at the VH spawning area on June $5^{\text {th }}$ (spawning had been observed May $18^{\text {th }}$ ) and all remaining records are from km 116.


- Fish was originally captured at km 115 but sex could not be determined (adult based on size).
- In September of 2005 it was captured as assessed as a code 4 male. This suggests that it was sexually mature (code 5) in 2006, however was not identified at the VH spawning area during the known spawning event (May $19^{\text {th }}$ to $21^{\text {st }}$ ). Telemetry records suggest it was moving downstream during the spawning event in 2006 and was located between km 124 and 105. These results suggest that the fish may not have matured until the following year (2007).
- In 2007, the fish was located at km 160 (Braeside) during the period where eggs were collected at VH. As a result the fish may have been part of a spawning event that occurred at that location.
- On June $5^{\text {th }}$ the fish was located at km 161 but was identified 30 km upstream at km 190 on June $6^{\text {th }}$. However, it did not remain at this location and instead returned to the VH spawning area were it was predominantly located from June $9^{\text {th }}$ to $18^{\text {th }}$.
- In both 2006 and 2007, the fish was located at km 89 (Stuart River confluence) at the end of summer suggesting it may be overwintering downstream of Stuart confluence or within the Stuart River. Database comment says fish identified "upstream in Nechako" therefore does not appear to have entered
Stuart
- Rated end of tag life is April 2010.

- Fish captured at km 124.9 in Sept 1999 and assessed as code 13
- Telemetry records have identified it at km 125 predominantly with 1 record from the Stuart River confluence (Sept $18^{\text {th }}, 2003$ )
- Tag was not detected in 2007 and based on rated tag life was Oct 2007 therefore is likely dead.


| 149.700 | 5 | 18-May-04 | 134 | A |
| :--- | :---: | :---: | :---: | :---: |
| 149.700 | 5 | 25-May-04 | 121.5 | A |
| 149.700 | 5 | 26-May-04 | 116 | GS |
| 149.700 | 5 | 08-Jun-04 | 89.7 | GS |
| 149.700 | 5 | 11-Jun-04 | 89.7 | GS |
| 149.700 | 5 | 18-Jun-04 | 89.7 | GS |
| 149.700 | 5 | 23-Jun-04 | 89.7 | GS |
| 149.700 | 5 | 11-Jul-04 | 89.7 | GS |
| 149.700 | 5 | 14-Mar-06 | 116.2 | S |

- Fish has been identified in the vicinity of the known spawning area at VH in May of 2002 and 2004. In 2004 it was identified on May $18^{\text {th }}$ which is the data spawning was observed. Fish was assessed as code 13 in 2001 and was potentially mature (code 15) by 2004.
- Fish has overwintered at km 116 ( $2002 / 2003$ ) and has been identified several time at km 89 (Stuart River confluence).
- In July of 2003 it was identified within the Stuart River but returned to the Nechako by early August, possibly as part of a feeding migration.
- Rated end of tag life was May 2006, therefore likely has expired.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4124741829 |  | 25/09/2001 | 116.8 | 4 | 199223 | 60.3 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |
| 149.700 | 9 | 25-Sep-01 | 116.8 | S | NECHAKO RIVER |  |  |  |
| 149.700 | 9 | 07-Dec-01 | 116 | A |  |  |  |  |
| 149.700 | 9 | 08-Apr-02 | 116.2 | S |  |  |  |  |
| 149.700 | 9 | 26-Apr-02 | 116 | A |  |  |  |  |
| 149.700 | 9 | 18-May-02 | 127.1 | A |  |  |  |  |
| 149.700 | 9 | 07-Jun-02 | 140.5 | A |  |  |  |  |
| 149.700 | 9 | 10-Jun-02 | 131 | B |  |  |  |  |
| 149.700 | 9 | 11-Jun-02 | 128 | B |  |  |  |  |
| 149.700 | 9 | 12-Jun-02 | 131.3 | A |  |  |  |  |
| 149.700 | 9 | 18-Jun-02 | 80 | A |  |  |  |  |
| 149.700 | 9 | 19-Jun-02 | 79 | B |  |  |  |  |
| 149.700 | 9 | 22-Jun-02 | 20.1 | A | STUART RIVER |  |  |  |
| 149.700 | 9 | 25-Jun-02 | 104.6 | A |  |  |  |  |
| 149.700 | 9 | 25-Jun-02 | 104.6 | GS |  |  |  |  |
| 149.700 | 9 | 29-May-03 | 104.2 | GS |  |  |  |  |
| 149.700 | 9 | 11-Jun-03 | 89.7 | GS | NECHAKO RIVER |  |  |  |
| 149.700 | 9 | 11-Jun-03 | 89.7 | A |  |  |  |  |
| 149.700 | 9 | 19-Jun-03 | 116.1 | A |  |  |  |  |
| 149.700 | 9 | 19-Jun-03 | 116.1 | GS |  |  |  |  |
| 149.700 | 9 | 28-Jun-03 | 0.1 | A | STUART RIVER |  |  |  |
| 149.700 | 9 | 03-Jul-03 | 90.4 | A | NECHAKO RIVER |  |  |  |
| 149.700 | 9 | 13-Jul-03 | 89.7 | GS |  |  |  |  |
| 149.700 | 9 | 14-Jul-03 | 90.4 | A |  |  |  |  |
| 149.700 | 9 | $15-\mathrm{Jul}-03$ | 89.7 | GS |  |  |  |  |
| 149.700 | 9 | 31-Jul-03 | 116.2 | A |  |  |  |  |
| 149.700 | 9 | 28-Apr-04 | 116.2 | A |  |  |  |  |
| 149.700 | 9 | 28-Apr-04 | 116.2 | B |  |  |  |  |
| 149.700 | 9 | 03-May-04 | 136 | GS |  |  |  |  |
| 149.700 | 9 | 04-May-04 | 134 | A |  |  |  |  |
| 149.700 | 9 | 04-May-04 | 134 | B |  |  |  |  |


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :--- |
| 149.700 | 9 | 06-May-04 | 136 | GS |  |
| 149.700 | 9 | 12-My-04 | 131 | A |  |
| 149.700 | 9 | 15-May-04 | 136 | GS |  |
| 149.700 | 9 | 18-May-04 | 138 | B |  |
| 149.700 | 9 | 19-May-04 | 136 | GS |  |
| 149.700 | 9 | 20-My-04 | 116 | GS |  |
| 149.700 | 9 | 25-May-04 | 134 | A |  |
| 149.700 | 9 | 25-May-04 | 136 | GS |  |
| 149.700 | 9 | 28-May-04 | 116 | GS |  |
| 149.700 | 9 | 29-May-04 | 116 | GS |  |
| 149.700 | 9 | 07-Jun-04 | 104.2 | GS | STUART RIVER |

- Fish captured at km 116 in Sept 2001 and assessed as code 4 suggesting it would be ripe the following year.
- Telemetry data shows the fish migrated to the vicinity of the VH spawning area sometime between May $18^{\text {th }}$ ( km 127 ) and June $7^{\text {th }}$ ( km 140.5 ).
- Following the assumed spawning event in 2002, the fish migrated to the Stuart River and was identified at km 20 and 104.6. In May of 2003 it was still located in the Stuart ( km 104 ) suggesting it overwintered there (possibly in Stuart Lake).
- For the remainder of 2003, the fish migrated between rearing locations at km 116 and the Stuart confluence.
- In 2004 the fish was identified at the VH spawning area between May $3^{\text {rd }}$ and May $19^{\text {th }}$ (congregation observed on May $18^{\text {th }}$ ). Fish briefly migrated to km 116 on May $20^{\text {th }}$ but returned to the VH spawning area on May $25^{\text {th }}$ and then back to km 116 on May $28 / 29^{\text {th }}$. By June $7^{\text {th }}$ the fish had returned to the Stuart River and was identified at the basestation moving upstream presumably to Stuart Lake.



| 149.700 | 2 | 04-May-04 | 134 | A |
| :--- | :--- | :---: | :---: | :---: |
| 149.700 | 2 | 04-May-04 | 134 | B |
| 149.700 | 2 | 12-May-04 | 128 | A |
| 149.700 | 2 | 16-May-04 | 136 | GS |
| 149.700 | 2 | 17-May-04 | 116 | GS |
| 149.700 | 2 | 18-May-04 | 138 | B |
| 149.700 | 2 | 18-May-04 | 137 | A |
| 149.700 | 2 | 19-May-04 | 136 | GS |
| 149.700 | 2 | 25-May-04 | 82 | A |
| 149.700 | 2 | 09-Jun-04 | 89.7 | GS |
| 149.700 | 2 | 10-Jun-04 | 116 | GS |
| 149.700 | 2 | 10-Jun-04 | 89.7 | GS |
| 149.700 | 2 | 11-Jun-04 | 89.7 | GS |
| 149.700 | 2 | 11-Jun-04 | 116 | GS |
| 149.700 | 2 | 19-Jun-04 | 116 | GS |
| 149.700 | 2 | 20-Jun-04 | 116 | GS |
| 149.700 | 2 | 21-Jun-04 | 116 | GS |
| 149.700 | 2 | 22-Jun-04 | 116 | GS |
| 149.700 | 2 | 23-Jun-04 | 116 | GS |
| 149.700 | 2 | 13-Jul-04 | 116 | GS |
| 149.700 | 2 | 18-Jul-04 | 116 | GS |
| 149.700 | 2 | 19-Jul-04 | 89.7 | GS |
| 149.700 | 2 | 20-Jul-04 | 89.7 | GS |
| 149.700 | 2 | 22-Jul-04 | 89.7 | GS |
| 149.700 | 2 | 23-Jul-04 | 89.7 | GS |
| 149.700 | 2 | 24-Jul-04 | 89.7 | GS |
| 149.700 | 2 | 21-Aug-04 | 89.7 | GS |
| 149.700 | 2 | 22-Aug-04 | 89.7 | GS |
| 149.700 | 2 | 25-Aug-04 | 89.7 | GS |
| 149.700 | 2 | 08-Sep-04 | 89.7 | GS |
| 149.700 | 2 | 13-May-06 | 110.2 | B |

- Fish captured at km 116 in Oct 2001 and assessed as code 4 suggesting it would be ripe the following year.
- Telemetry data shows the fish in the vicinity of the VH spawning area between May $28^{\text {th }}$ and June $7^{\text {th }}, 2002$.
- Following the presumed spawning event, it migrated to $\mathrm{km} 80-90$ where it spent the summer rearing and feeding.
- Fish likely overwintered in 2002/2003 at km 116 . The summer of 2003 it was identified at km 90 and $\mathrm{km} \mathrm{70.4}$, presumably rearing and feeding.
- In 2004, fish was identified at the VH spawning area between May $4^{\text {th }}$ and $19^{\text {th }}$ and presumable spawned as part of observed congregation on May $18^{\text {th }}$.
- Following spawning, fish migrated to km 89 and 116 for rearing and feeding.
- Last record was from May 2006 at km 110. Tag is presumed to be dead (rated end of life was October 2003).
- Fish was recaptured in Sept 2007 at km 116 (code 97).

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 41250B2C18 | $24 / 09 / 2001$ | 124.7 | 2 | 172 | 196 | 39.044 |  |  |
|  | $12 / 05 / 2006$ | 132.1 | 2 | 185 | 210 | 54 |  |  |



- Fish captured at km 115 in Oct 2001 and assessed as code 4 suggesting it would be ripe the following year.
- Telemetry data shows the fish migrated to km 130 (approx $6 \mathrm{~km} \mathrm{~d} / \mathrm{s}$ of VH spawning area) on May $28^{\text {th }}, 2002$. Fish then migrated downstream and was located at km 58 on June $22^{\text {nd }}$. Migration likely associated with rearing/feeding habitat.
- On May $26^{\text {th }}, 2003$ fish was identified in the Fraser River at km 668
- Single record from 2003 at km 81 (July $3^{\text {rd }}$ ).
- Single record from 2004 at km 116 (May 26). Was not identified as part of the congregation at the VH spawning area in 2004.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 412515071A |  | 28/09/2001 | 116.2 | 4 | $183.5 \quad 207.5$ | 51.3 |  |  |
| 412515071A |  | 12/05/2006 | 132.1 | 2 | 180209 | 51 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |
| 149.700 | 8 | 28-Sep-01 | 116.2 | S | NECHAKO RIVER |  |  |  |
| 149.700 | 8 | 10-Nov-01 | 116 | A |  |  |  |  |
| 149.700 | 8 | $05-\mathrm{Apr}-02$ | 116.2 | S |  |  |  |  |
| 149.700 | 8 | 26-Apr-02 | 116 | A |  |  |  |  |
| 149.700 | 8 | 18-May-02 | 124.5 | A |  |  |  |  |
| 149.700 | 8 | 28-May-02 | 135.3 | A |  |  |  |  |
| 149.700 | 8 | 07-Jun-02 | 140.5 | A |  |  |  |  |
| 149.700 | 8 | 12-Jun-02 | 78.4 | A |  |  |  |  |
| 149.700 | 8 | 15-Jun-02 | 80.6 | B |  |  |  |  |
| 149.700 | 8 | 18-Jun-02 | 80.4 | A |  |  |  |  |
| 149.700 | 8 | 19-Jun-02 | 78.6 | B |  |  |  |  |
| 149.700 | 8 | 22-Jun-02 | 80 | A |  |  |  |  |
| 149.700 | 8 | 25-Jun-02 | 79 | A |  |  |  |  |
| 149.700 | 8 | 25-Jun-02 | 79 | GS |  |  |  |  |
| 149.700 | 8 | 28-Jun-02 | 76.4 | A |  |  |  |  |
| 149.700 | 8 | 29-Jun-02 | 75.2 | B |  |  |  |  |
| 149.700 | 8 | 01-Jul-02 | 76 | B |  |  |  |  |
| 149.700 | 8 | 03-Jul-02 | 74.8 | B |  |  |  |  |
| 149.700 | 8 | 04-Jul-02 | 90 | GS |  |  |  |  |
| 149.700 | 8 | 17-Jul-02 | 146.4 | A |  |  |  |  |
| 149.700 | 8 | 19-Jun-03 | 104.2 | GS | STUART RIVER |  |  |  |
| 149.700 | 8 | 19-Jun-03 | 59.8 | A |  |  |  |  |
| 149.700 | 8 | 03-Jul-03 | 19.5 | A |  |  |  |  |
| 149.700 | 8 | 14-Jul-03 | 116.4 | A | NECHAKO RIVER |  |  |  |
| 149.700 | 8 | 31-Jul-03 | 116.2 | A |  |  |  |  |
| 149.700 | 8 | 28-Apr-04 | 116.2 | A |  |  |  |  |
| 149.700 | 8 | 28-Apr-04 | 116.2 | B |  |  |  |  |
| 149.700 | 8 | 03-May-04 | 136 | GS |  |  |  |  |
| 149.700 | 8 | 04-May-04 | 134 | B |  |  |  |  |
| 149.700 | 8 | 04-May-04 | 134 | A |  |  |  |  |
| 149.700 | 8 | 12-May-04 | 123 | A |  |  |  |  |
| 149.700 | 8 | 19-May-04 | 116 | GS |  |  |  |  |
| 149.700 | 8 | 21-May-04 | 136 | GS |  |  |  |  |
| 149.700 | 8 | 23-May-04 | 116 | GS |  |  |  |  |
| 149.700 | 8 | 24-May-04 | 116 | GS |  |  |  |  |
| 149.700 | 8 | 25-May-04 | 136.5 | A |  |  |  |  |
| 149.700 | 8 | 28-May-04 | 116 | GS |  |  |  |  |
| 149.700 | 8 | 16-Jun-04 | 89.7 | GS |  |  |  |  |
| 149.700 | 8 | 19-Jun-04 | 89.7 | GS |  |  |  |  |
| 149.700 | 8 | 26-Jun-04 | 104.2 | GS | STUART RIVER |  |  |  |
| 149.800 | 49 | 18-May-06 | 134 | GS | NECHAKO RIVER |  |  |  |
| 149.800 | 49 | 22-May-06 | 107 | A |  |  |  |  |
| 149.800 | 49 | 02-Jun-06 | 134 | GS |  |  |  |  |


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :--- |
| 149.800 | 49 | 13-Jun-06 | 89 | A |  |
| 149.800 | 49 | 27-Jun-06 | 104.2 | GS | STUART RIVER |
| 149.800 | 49 | 16-May-07 | 116 | A | NECHAKO RIVER |
| 149.800 | 49 | 25-May-07 | 132 | A |  |

- Assessed as code 4 in fall of 2001, therefore likely code 5 (ripe) in spring of 2002. Was identified in the vicinity of the VH spawning area from May $27^{\text {th }}-$ June $7^{\text {th }}, 2002$ (potential spawning event).
- Was not identified as part of the 2004 spawning congregation (May $18^{\text {th }}$ ), however, migrated to the VH spawning area May $21^{\text {st }}$ and $25^{\text {th }}$.
- Was not identified as part of the 2006 spawning congregation (May $19^{\text {th }}-21^{\text {st }}$ ), however was identified at km 134 (approx $2 \mathrm{~km} \mathrm{~d} / \mathrm{s}$ of Burrard Bridge) on May $18^{\text {th }}$ and June $2^{\text {nd }}$.
- In 2007, fish was identified at km 132 (approximately $4 \mathrm{~km} \mathrm{~d} / \mathrm{s}$ of Burrard Bridge) on May $25^{\text {th }}$ ( 10 days prior to eggs being collected).
- Has been identified on 4 occasions within the Stuart River. In 2003, 2004 and 2006, the fish was identified within the Stuart at the end of June. This suggests it is likely overwintering in Stuart Lake and migrating into the Nechako to spawn.
- Rated end of tag life is December 2010.


- Fish captured at km 115 in Sept 2001 and assessed as code 4 suggesting it would be ripe the following year.
- Telemetry data shows the fish at the VH spawning area on June $2^{\text {nd }}, 2002$. Fish then migrated downstream and was located at km 90 on July 3 rd. Migration likely associated with rearing/feeding.
- Fish may have been in Stuart Lake between July 2002 and June 2003.
- In 2003, fish was identified in the Stuart River ( km 104 and 85.7 ; June $19^{\text {th }}$ ) before moving into the Nechako (km 116; July $14^{\text {th }}$ and $31^{\text {st }}$ ).
- In 2004, fish was identified at the VH spawning area on May $3^{\text {rd }}, 18^{\text {th }}, 19^{\text {th }}$, and $27^{\text {th }}$, with migrations to km 116 interspersed between those dates. By the end of June, fish was located at km 116.
- Final record is from km 116 in March 2006. No records from 2007 and tag is presumed dead (rated end of life May 2006).


| 149.700 | 10 | 20-Oct-03 | 116 | GS |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency | Code | Telem. Date | River Km | Station | River |
| 149.700 | 10 | 28-Apr-04 | 128 | A |  |
| 149.700 | 10 | 28-Apr-04 | 128 | B |  |
| 149.700 | 10 | 04-May-04 | 157 | A |  |
| 149.700 | 10 | 12-May-04 | 154 | A |  |
| 149.700 | 10 | 18-May-04 | 154 | A |  |
| 149.700 | 10 | 25-May-04 | 154 | A |  |
| 149.700 | 10 | 18-Jun-04 | 136 | GS |  |
| 149.700 | 10 | 21-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 22-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 23-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 24-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 25-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 26-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 27-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 28-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 29-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 30-Jun-04 | 116 | GS |  |
| 149.700 | 10 | 08-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 09-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 10-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 11-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 12-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 13-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 14-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 15-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 16-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 21-Jul-04 | 116 | GS |  |
| 149.700 | 10 | 01-Jul-05 | 116 | GS |  |
| 149.700 | 10 | 02-Jul-05 | 116 | GS |  |
| 149.700 | 10 | 03-Jul-05 | 116 | GS |  |
| 149.700 | 10 | 04-Jul-05 | 116 | GS |  |
| 149.700 | 10 | 05-Jul-05 | 116 | GS |  |
| 149.700 | 10 | 06-Jul-05 | 116 | GS |  |
| 149.700 | 10 | 07-Jul-05 | 116 | GS |  |

- Fish captured at km 115 in Sept 2001 and assessed as code 4 suggesting it would be ripe the following spring.
- Telemetry data shows the fish at km 131 on May $28^{\text {th }}, 2002$ (approx $5 \mathrm{~km} \mathrm{~d} / \mathrm{s}$ of VH spawning area). This may have been associated with a spawning event. Fish then migrated downstream and was located at km 73-81 through June and July. Migration likely associated with rearing/feeding.
- Fish likely overwintered at km 116 in 2002/2003.
- Fish was identified in vicinity of km 154 from May $26^{\text {th }}$ and June $19^{\text {th }}, 2003$ and from May $12^{\text {th }}$ to $25^{\text {th }}, 2005$. The 2004 dates overlap observed spawning activity at VH and the potential exists that this fish may have been staging at km 154 but unlikely it was spawning since it likely spawned in 2003.
- All records from 2004 and 2005 are from km 116 (rearing).

- Fish was tagged in Sept 2005 and likely overwintered at km 124.
- In 2006, fish was located at km 158 (approx $4 \mathrm{~km} \mathrm{~d} / \mathrm{s}$ of Braeside) during period where spawning was observed at VH (May 19-22 ${ }^{\text {nd }}$ ). Last recorded location in 2006 (Aug $10^{\text {th }}$ ) was at km 160 . The overwintering location for 2006 is unknown.
- In 2007, fish was identified at the VH spawning area on May $18^{\text {th }}$, then again on June $2^{\text {nd }}$, $3^{\text {rd }}$, and $5^{\text {th }}$ (period when eggs were collected from that location). This suggests the fish spawned during the 2007 event. Therefore the fish would have matured from code 11 in Sept 2005 to code 15 in May 2007.
Alternatively, fish may have been displaying immature movements responding to cues but not spawning.
- Following possible spawning, the fish migrated to the section upstream of the Stuart River confluence presumably for feeding/rearing. However, the fish returned to the VH spawning area by mid-August and remained there through mid-September.
- Rated end of tag life is April 2010.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 41392C0A2D | $05 / 07 / 1999$ | 125.2 | 98 | 77 | 88 | 3.5 | 10 | 1989 |  |
|  | $28 / 09 / 2001$ | 125.1 | 98 | 92 | 102.5 | 5.5 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |  |
| 413931641C | $10 / 09 / 1999$ | 125 | 2 | 98.5 | 114 | 8.2 | 18 | 1981 |  |
|  | $17 / 05 / 2006$ | 124.5 | 97 | 120 | 137 | 12 |  |  |  |



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| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 13 | 04-May-04 | 132.8 | B |  |
| 149.700 | 13 | 12-May-04 | 133 | A |  |
| 149.700 | 13 | 15-May-04 | 136 | GS |  |
| 149.700 | 13 | 18-May-04 | 116 | GS |  |
| 149.700 | 13 | 18-May-04 | 108.5 | A |  |
| 149.700 | 13 | 25-May-04 | 85.5 | A |  |
| 149.700 | 13 | 10-Jun-04 | 89.7 | GS |  |
| 149.700 | 13 | 20-Jun-04 | 89.7 | GS |  |
| 149.700 | 13 | 25-Jun-04 | 89.7 | GS |  |
| 149.700 | 13 | 10-Jul-04 | 89.7 | GS |  |
| 149.700 | 13 | 11-Jul-04 | 89.7 | GS |  |
| 149.700 | 13 | 14-Jul-04 | 89.7 | GS |  |
| 149.700 | 13 | 15-Jul-04 | 89.7 | GS |  |
| 149.700 | 13 | 18-Jul-04 | 89.7 | GS |  |

- Fish captured at km 124 in Oct 2001 and assessed as code 4 suggesting it would be ripe (code 5) the following year.
- Telemetry data shows the fish migrated to km 70 in Nov but was at km 124 in Dec (overwintering).
- In 2002, telemetry data shows the fish at the VH spawning area from June $7^{\text {th }}-12$ th. Fish then migrated downstream and was located at km 94 through July. Migration likely associated with rearing/feeding.
- In 2003, fish was at km 133 on May 26-28 ${ }^{\text {th }}$, but migrated d/s to vicinity of km 94 in June and July.
- In 2004, fish was identified at km 136 on May $15^{\text {th }}$ but on day that spawning was observed (May $18^{\text {th }}$ ) fish had returned to km 116 . As a result it is unclear if fish spawned or not.

- Captured in Sept 2005 at km 116. Adult fish based on size but sex unknown.
- Telemetry shows fish remained at km 120-125 in 2006.
- Was not identified in 2007 (frequency not tracked due to tag being different codeset).

| PITtag |  | Capture Date | River Km | Sex | FL(cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 422E754551 |  | 19/09/2002 | Stuart Lake | 3 | 195 | 231 | 61 | 44 | 1958 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 148.420 | 12 | 19-Sep-02 | 31.8 | B | STUART LAKE |  |  |  |  |
| 148.420 | 12 | 03-JJl-03 | 90.2 | A | NECHAKO RIVER |  |  |  |  |
| 148.420 | 12 | 14-Jul-03 | 91 | A |  |  |  |  |  |
| 148.420 | 12 | 31-Jul-03 | 116 | A |  |  |  |  |  |
| 148.420 | 12 | 28-Apr-04 | 116.2 | B |  |  |  |  |  |
| 148.420 | 12 | 25-Jun-04 | 89.7 | GS |  |  |  |  |  |
| 148.420 | 12 | 13-Jun-06 | 32 | A |  |  |  |  |  |
| 148.420 | 12 | 27-Jun-06 | 49 | A |  |  |  |  |  |
| 148.420 | 12 | 10-Aug-06 | 34 | A |  |  |  |  |  |
| 148.420 | 12 | 2--Jul-07 | 104.2 | GS | STUART RIVER |  |  |  |  |

- Fish originally captured in Stuart Lake (Sept 2002) and has been identified in the Stuart River at km 32 (Sept 2002) and km 104 (July 2007).
- Fish was identified in the Nechako at km 90 (July 2003) and then moved to km 116 where it likely overwintered.
- In 2004, fish was located at km 89 (Stuart River confluence) on June $25^{\text {th }}$.
- In 2006, fish was identified at $\mathrm{km} 32-49$ from June $27^{\text {th }}$ and August $10^{\text {th }}$. This area has been used by other fish during the same period and likely provides feeding opportunities.
- In 2007, tag was only identified once in the Stuart River (km 104.2). Fish may have migrated back into Stuart Lake (direction of travel not determined).


- Fish captured at km 90 in June 2002 and assessed as code 14 female suggesting it may be sexually mature the following year.
- In 2003, fish was not identified at VH spawning area and instead was located in vicinity of km 45 in June and July. This area is assumed to provide rearing and feeding habitat.
- In 2004-2006 fish was only identified at either km 116 or 89 (Stuart River confluence). It was not identified at the VH spawning area during any known spawning events.
- In 2007 fish was located between km 105 (June $8^{\text {th }}-18^{\text {th }}$ ) and km 89 (May $2^{\text {nd }}$, July $22^{\text {nd }}-27^{\text {th }}$ ).
- Rated end of tag life is unknown.

- Fish captured in August 2005 at km 116 and assessed as being adult based on size but sex unknown.
- Likely overwintered at km 116 in 2005/2006 and was identified at km 130 on May $11^{\text {th }} 2006$. At end of May was located at km 108. Migrations presumably for rearing and feeding due to sexual immaturity.
- Frequency not tracked in 2007 due to tag being a different codeset.

- Fish originally captured in Stuart Lake in Sept 2004 (code 2).
- Telemetry data identified the fish at km 116 from Oct 2005 to May 2007.
- Fish showed some limited movement in the summer of 2007 between May $5^{\text {th }}$ and July $4^{\text {th }}$ between km 116 and 123, respectively.
- On Aug $30^{\text {th }}$ and Sept $5^{\text {th }}$ it was identified at the Nautley confluence ( km 192 ). Direction suggests it was in Fraser Lake between those dates.
- Rated end of tag life is April 2009.

- Telemetry records exist before tagging date. Likely data entry error.
- Fish originally tagged in Stuart Lake (Sept 2004) and was assessed as an adult based on size but sex unknown.
- Fish has shown migrations to the vicinity of km 132 in spring of 2005, 2006 and 2007, however has not been identified within any spawning congregations.
- Fish is too young to be spawning and is likely just responding to spawning cues.
- Rated end of tag life is April 2009.

- Originally tagged in Stuart Lake in Sept 2002 (code 17) and overwintered there.
- Identified in Stuart River on June $3^{\text {rd }}, 2003$ (km 104) but by June $19^{\text {th }}$ was identified at km 116.
- On May $15^{\text {th }}, 2004$ fish was identified at the VH spawning area however, had returned to km 116 on May $17^{\text {th }}$. The congregation was observed on May $18^{\text {th }}$ and it is unclear if fish spawned or not.
- Has not been identified since July $24^{\text {th }} 2004$ at km 89 (Stuart confluence) and may have returned to Stuart Lake.

- Fish originally tagged at km 116 in Sept of 2005. Adult based on size but sex unknown.
- Telemetry records are all from 2007 when fish moved between km 110 (May $14^{\text {th }}$ ) and km 127 (May 30 $0^{\text {th }}$ ). In June and July fish had returned to km 116.
- Possibly a mortality in Nautley River (Pers. Comm. Cory Williamson)
- Rated end of tag life is unknown.

- Fish was captured at km 129 on May $10^{\text {th }}, 2007$ and assessed as a ripe male (code 5). Fish used as brood stock for 2007 hatchery program (male \#1).
- Telemetry data shows the fish migrated to the VH spawning area on June $8^{\text {th }}$, which was the second day eggs were collected from that location.
- Rated end of tag life is January 2012.


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 20 | 13-Jun-07 | 107 | A |  |
| 149.700 | 20 | 15-Jun-07 | 104 | A |  |
| 149.700 | 20 | 15-Jun-07 | 104 | A |  |
| 149.700 | 20 | 18-Jun-07 | 105 | A |  |
| 149.700 | 20 | 18-Jun-07 | 105 | A |  |
| 149.700 | 20 | 21-Jun-07 | 108 | A |  |
| 149.700 | 20 | 21-Jun-07 | 108 | A |  |
| 149.700 | 20 | 27-Jun-07 | 106 | A |  |
| 149.700 | 20 | 27-Jun-07 | 106 | A |  |
| 149.700 | 20 | 04-Jul-07 | 108 | A |  |
| 149.700 | 20 | 04-Jul-07 | 108 | A |  |
| 149.700 | 20 | 06-Jul-07 | 108 | A |  |
| 149.700 | 20 | 06--Jul-07 | 108 | A |  |
| 149.700 | 20 | 09-Jul-07 | 106 | A |  |
| 149.700 | 20 | 09-Jul-07 | 106 | A |  |
| 149.700 | 20 | 11-Jul-07 | 107 | A |  |
| 149.700 | 20 | 11-Jul-07 | 107 | A |  |
| 149.700 | 20 | 16-Jul-07 | 108 | A |  |
| 149.700 | 20 | 16-Jul-07 | 108 | A |  |
| 149.700 | 20 | 01-Sep-07 | 89.7 | GS |  |
| 149.700 | 20 | 01-Sep-07 | 89.7 | GS |  |
| 149.700 | 20 | 04-Sep-07 | 89.7 | GS |  |
| 149.700 | 20 | 04-Sep-07 | 89.7 | GS |  |

- Fish has never been identified in known spawning areas. Likely too young.
- Predominantly located in the vicinity of km 110 and was identified at the Stuart Confluence in Sept of 2007.
- Estimated end of tag life December 2011.
- Fork length for 2007 assessment entered as 0.5 cm but should be 90.5 cm (Pers. Comm. Cory Williamson)

| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| 424D654209 |  | $17 / 09 / 2002$ | Stuart Lake | 2 | 141 | 157 | 71.363 | $28-40+$ |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |

- Fish only identified in Stuart Lake.
- Rated end of tag life was May 2005 therefore assumed to be dead.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :--- | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| 424E476B0C |  | $07 / 09 / 2004$ | Stuart Lake | 15 | 262 | 292 | 151.8 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 148.380 | 1 | 25-Oct-00 | 116.2 | B | NECHAKO RIVER |  |  |  |  |
| 148.380 | 1 | $06-A p-06$ | 116.2 | S |  |  |  |  |  |
| 148.380 | 1 | $01-M a y-06$ | 124.6 | A |  |  |  |  |  |

- Fish captured in Stuart Lake and assessed as ripe female (code 15). Fish identified at km 116 and 124 in Oct 2005 and April/May 2006, respectively.
- Rated end of tag life is April 2009.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 424E574A40 |  | 07/09/2004 | Stuart Lake | 13 | 231 | 259 | 83.035 | 56 | 1948 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 148.380 | 5 | 13-May-06 | 129.4 | B | NECHAKO RIVER |  |  |  |  |
| 148.380 | 5 | $08-$-Jul-06 | 104.2 | GS | STUART RIVER |  |  |  |  |
| 148.380 | 5 | 16-May-07 | 132 | A | NECHAKO RIVER |  |  |  |  |
| 148.380 | 5 | 17-May--7 | 135.7 | GS |  |  |  |  |  |
| 148.380 | 5 | 17-May-07 | 135.7 | GS |  |  |  |  |  |
| 148.380 | 5 | 23-May-07 | 125 | A |  |  |  |  |  |
| 148.380 | 5 | 26-May-07 | 135.7 | GS |  |  |  |  |  |
| 148.380 | 5 | 01-Jun-07 | 89.7 | GS |  |  |  |  |  |
| 148.380 | 5 | 07-Jun-07 | 104.2 | GS | STUART RIVER |  |  |  |  |

- Fish originally captured in Stuart Lake in Sept 2004 (female, code 13).
- In 2006, was identified in the Nechako (km 129, May 13 ${ }^{\text {th }}$ ) and Stuart (km 104, July $8^{\text {th }}$ ), presumably entered lake.
- In 2007, fish was identified at the VH spawning area on May $17^{\text {th }}$ and $26^{\text {th }}$ but had left area and returned to the Stuart River (km 104) by June $7^{\text {th }}$. As a result fish likely did not take part in spawning that occurred between June $2^{\text {nd }}$ and $9^{\text {th }}$.
- Fish likely returned to Stuart Lake.
- Rated end of tag life is April 2009.


| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| 424F046D54 |  | 09/09/2004 | Stuart Lake | 16 | 218 | 247 | 79.464 | nr |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 149.800 | 3 | 07-Sep-04 | 110 | B | STUART LAKE |  |  |  |  |
| 149.800 | 3 | 09-Sep-04 | 0 | B |  |  |  |  |  |
| 149.800 | 3 | 10-May-05 | 104.2 | GS | STUART RIVER |  |  |  |  |
| 149.800 | 3 | $07-J u l-05$ | 89.7 | GS | NECHAKO RIVER |  |  |  |  |
| 149.800 | 3 | $08-J u l-05$ | 89.7 | GS |  |  |  |  |  |

- Fish tagged in Stuart Lake in Sept 2004.
- Fish was identified in the Stuart River (km 104) in May 2005 and at the confluence of the Stuart in July 2005.
- Rated end of tag life was May 2007 therefore likely dead.

- Fish originally captured in Stuart Lake in Sept 2004.
- In May 2006, fish was identified at km 116 (Nechako).
- Fish was identified at VH spawning area on May $26^{\text {th }}, 2007$ but was not identified within spawning congregation from June $2-8^{\text {th }}, 2007$. As a result, it is unclear whether fish was involved in spawning or not.
- On August $20^{\text {th }}$, fish was identified at Stuart confluence and may have returned to Stuart system.
- Rated end of tag life is April 2009.

- Originally captured at km 116 in Sept 2005 and assessed as a juvenile based on size.
- Telemetry predominantly locates it at known overwintering/rearing locations (km 116, 110 and 105), however fish does show short migrations presumably associated with rearing and feeding.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4250137C79 |  | 09/09/2004 | Stuart Lake | 11 | 210 | 236 | 64.285 | 44 | 1960 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 148.380 | 4 | 18-Jul-05 | 89.7 | GS | NECHAKO RIVER |  |  |  |  |
| 148.380 | 4 | 20-Jul-05 | 89.7 | GS |  |  |  |  |  |
| 148.380 | 4 | 24-Jul-05 | 89.7 | GS |  |  |  |  |  |
| 148.380 | 4 | 25-Cct-05 | 116.2 | B |  |  |  |  |  |
| 148.380 | 4 | 14-Mar-06 | 116.2 | S |  |  |  |  |  |
| 148.380 | 4 | 06-Apr-06 | 116.2 | S |  |  |  |  |  |
| 148.380 | 4 | 27-Apr-06 | 116.2 | S |  |  |  |  |  |
| 148.380 | 4 | 01-May-06 | 116.2 | A |  |  |  |  |  |

- Fish originally tagged in Stuart Lake (Sept 2004) and has since been identified at km 89 (Stuart confluence, July 2005) and km 116 (Oct 2005 - May 2006).
- Rated end of tag life is April 2009.

- Fish originally captured at km 124.5 in May 2006 and assessed as code 3. Telemetry data from 2006 show the fish moved from km 125 to km 116 where is likely overwintered.
- In 2007, fish was located at the VH spawning area from May $29^{\text {th }}$ to June $10^{\text {th }}$ and therefore it may have taken part in spawning activities observed at that location from June $2^{\text {nd }}$ to $8^{\text {th }}$.
- Following spawning, fish moved downstream to km 89.7 (Stuart confluence).
- Rated end of tag life is Dec 2010.

$149.800 \quad 50 \quad$ 16-Jul-07 $\quad 107 \quad$ A
- Identified in the vicinity of the 2006 spawning congregation at Vanderhoof (May $22^{\text {nd }}, \mathrm{km} \mathrm{134}$ ).
- Migrated to VH spawning area at the end of May 2007. Potentially could have been present for beginning of spawning event (June $2^{\text {nd }}$ ) but was identified upstream at km 181 on June $5^{\text {th }}$ and therefore left part way through (second group of eggs were collected from VH June $8^{\text {th }}$ ). The fish remained at $\mathrm{km} 181-$ 190 until June $18^{\text {th }}$, suggesting potential spawning or rearing/feeding habitat in that area.
- Fish was last identified at km 107 on July $17^{\mathrm{th}}, 2007$. Potential overwintering habitat could be km 116 or 110 .
- Estimated end of life of tag December 2011.

- Fish originally tagged in Sept 2005 at km 124.7 (code 2). Telemetry data from 2005 and 2006 predominantly locate it in the vicinity of km 116.
- In 2007, fish migrated from km 108 (May $10^{\text {th }}$ ) to km 125 (June $3^{\text {rd }}$ ) likely in response to spawning cues. However, fish was not identified at known VH spawning area and therefore likely did not spawn.
- Rated end of tag life is April 2010.

- Fish orig inally tagged at km 115 in May 2007 and assessed as a ripe female (code 15). Fish was used a brood stock for 2007 hatchery program (Female \#3).
- Fish was released back into the river at km 135.7 and remained in vicinity of spawning area till June $4^{\text {th }}$. Fish may or may not have contributed eggs to those collected at the VH location during that period.
- Fish migrated into Stuart River ( km 104 , June $27^{\text {th }}$ ) but returned to Nechako ( km 135 , July $16^{\text {th }}$ ). Rationale for migration unclear but fish may have been responding to spawning cues or seeking out rearing habitat.
- Rated end of tag life is unknown.

- Fish originally captured at km 116 in May 2007 and assessed as being a ripe male (code 5). Taken as brood stock for the 2007 hatchery program (Male \#2).
- Fish was released back into the river at km 126 on June $3^{\text {rd }}$. Following release the fish migrated to the Stuart confluence and into the Stuart River. On August $6^{\text {th }}$ the fish was located at km 104 and moved into Stuart Lake.
- Rated end of tag life is January 2012.

- Fish was captured at km 116 in May 2007 and assessed as being ripe (code 5). Taken as brood stock for the 2007 hatchery program (Male \#3).
- Released on June $3^{\text {rd }}$ at km 131 and fish remained in that general area until July $16^{\text {th }}$.
- On Sept $1^{\text {st }}$ fish was identified at Stuart confluence.
- Rated end of tag life is January 2012.

- Fish originally captured at km 116 in Sept 2005 and assessed as a code 3 male. Fish appears to have overwintered at $\mathrm{km} 124 \mathrm{in} 2005 / 2006$.
- In 2006, fish was predominantly located at km 130 and likely overwintered at km 116.
- In 2007, fish was identified at the VH spawning area on May $20^{\text {th }}$ but migrated upstream to km 151 (May $23^{\text {rd }}$ ), 190 (May $27^{\text {th }}$ ), and 181 (May $28^{\text {th }}$ ). Fish may have been responding to spawning cues but was not observed at congregations at VH or Braeside.
- Rated end of tag life is April 2010.

- Fish was assessed as being ripe (code 5) on May $17^{\text {th }}, 2006$ and was identified in the vicinity of the 2006 spawning congregation at Vanderhoof (km 134) between May $18^{\text {th }}$ and $22^{\text {nd }}$. Potentially overwintered at km 116 in 2006.
- Did not migrate to the known VH spawning area in 2007 and was instead located in the vicinity of the Stuart confluence during the spawning period.
- Estimated end of tag life December 2010.

- Captured at km 125 in May 2006 and assessed as an adult based on size. Fish was predominantly located at km 134 in 2006 but migrated there after the 2006 spawning event which occurred around May $19^{\text {th }}$.
- In 2007, fish was identified at the VH spawning area from June $1^{\text {st }}-4^{\text {th }}$ which corresponds to when spawning was observed in that area. However, due to being a juvenile fish was likely only responding to spawning cues and not spawning.
- Fish briefly migrated to km 160 on June $5^{\text {th }}$ and then returned to km 135 where it remained. Small congregation was observed at km 160 (Braeside) and fish likely was responding to spawning cues in that area
- Rated end of tag life is December 2010.

- Captured at km 114.9 in Sept of 2005 and assessed as a code 12 female. Fish likely overwintered at km 124 in 2005/2006.
- In 2006, fish predominantly located at km 90 with exception of a migration to km 45 (feeding/rearing) in June.
- In 2007, fish was predominantly located at km 105 but showed increased movement in July when it moved to km 124 (rearing) and in August when it moved to km 89.7 (Stuart Confluence).
- Rated end of tag life is April 2010.

- Fish captured at km 117 in Sept of 2005. Assessed as code 12 female.
- Fish overwintered at km 116 in 2005/2006 and remained in the vicinity of km 105 through 2006 and 2007 with the exception of rearing migrations to km 125 and 89.
- Not identified at VH spawning area.
- Rated end of tag life is April 2010.

- Fish captured at km 116 in Sept 2005 and assessed as code 4 male suggesting it may be ready to spawn in 2006.
- Fish was recaptured at km 124.5 on May $11^{\text {th }}, 2006$ but was not assessed and data was not collected. Fish was used as brood stock (Male \#1) classified as code 5 flowing male based on external exam. Fish was released at km 135 on May $25^{\text {th }}$.
- On June $23^{\text {rd }} 2006$ fish was identified at km 104 in the Stuart River and direction data suggests it overwintered in Stuart Lake.
- In 2007, fish was identified at km 108 and 89 and was not identified at the VH spawning area.
- Rated end of tag life is May 2010.

- Fish captured in May 2007 at km 115 and assessed as ripe (code 15). Fish migrated to km 135.7 on June $2^{\text {nd }}$ and spawned
- Following spawning fish remained at km 120-129.
- Rated end of tag life is December 2011.

- Fish captured at km 116 in May 2007 and assessed as ripe (code 15). Fish was taken as brood stock for 2007 hatchery program (female \#2).
- Fish released at km 135 on June $1^{\text {st }}$ and migrated downstream to km 89 (Stuart confluence, June $15^{\text {th }}$ ) and into the Stuart Lake ( km 104 , June $26^{\text {th }}$ ).
- Rated end of tag life is January 2012.

- Captured at km 114.9 in May 2007 and assessed as ripe (code 5).
- Fish migrated to VH spawning area on June $2^{\text {nd }}$ and remained to the $4^{\text {th }}$. On June $13^{\text {th }}$, fish was identified at km 159.6 near the Braeside congregation location. Fish then returned to km 135 and began to migrate downstream.
- On Sept $18^{\text {th }}$, fish was identified at km 89 (Stuart confluence).
- Rated end of tag life is December 2011.

- Fish captured at km 116 in Sept 2005 and assessed as code 3 male.
- In 2006 fish migrated to km 134 but was not identified at VH spawning area during observed congregation.
- In 2007, fish migrated to VH spawning area on May $10^{\text {th }}, 11^{\text {th }}$, and $29^{\text {th }}$ but moved upstream prior to observed spawning at that location.
- By June $5^{\text {th }}$, fish was at km 175.9 and returned to km 95 on June $8^{\text {th }}$. However, this may be a data entry error as neither basestation at km 135 detected passage of fish. Should be 195.
- Fish remained at km 192.5 (Nautley River confluence) through August likely for rearing and was detected at km 135.7 on Sept $4^{\text {th }}$.
- Rated end of tag life is April 2010.

- Fish was originally captured at km 116 in Sept of 2005 and assessed as a code 12 female. Through majority of 2005/2006 fish remained at km 116 and was not identified at the VH spawning area.
- In mid May 2006, fish showed short rearing migrations to km 124 and 120 and then migrated downstream to the Nechako confluence (June $15^{\text {th }}$ ). Fish does not appear again until Aug 2007 (Stuart Confluence) and entered the Fraser River.
- Rated end of tag life is April 2010.

- Fish originally captured at km 124 in Sept 2005 and assessed as a non-reproductive male (code 1). In 2005/2006 fish overwintered at km 116.
- In 2006, fish migrated between km 111 and 120 presumably for rearing and was not identified at VH spawning site. On August $10^{\text {th }}$ fish was identified at km 130.
- In 2007, fish remained at rearing habitats such as $\mathrm{km} 116,110$ and 126 and was not identified upstream of km 129 .
- Rated end of tag life is April 2010.

- Fish was originally captured at km 132 in May 2006 and assessed as a ripe male (code 5). No telemetry records exist between capture and June $26^{\mathrm{th}}$ (km 89.7) and fish was not used for brood stock (no milt on external exam). As a result it is unclear where the fish was during the 2006 spawning event.
- In 2007, fish migrated to the VH spawning area on June $2^{\text {nd }}$ and remained in general area until June $11^{\text {th }}$. Fish likely spawned during this period.
- Following spawning, fish migrated downstream to km 89.7 (Stuart Confluence).
- Rated end of tag life is December 2010.

- Fish originally captured at km 116 in Sept 2005 and assessed as a code 4 male suggesting it may be ready to spawn in 2006.
- Telemetry data from 2006 show it remained at km 116 until May $20^{\text {th }}$ when it was identified at the Nechako confluence. Fish entered Fraser until Sept $25^{\text {th }}$ when it was again detected at the confluence. Fish then migrated upstream to the Stuart confluence (Sept $29^{\text {th }}$ ).
- In 2007, fish was located at km 116 with short rearing migrations to km 105 and 124.
- Fish has not been identified at VH spawning area and therefore may be ripe in 2008.
- Rated end of tag life April 2010.

| PITtag |  | Capture Date | River Km | Sex | FL(cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 45294B4052 |  | 13/05/2007 | 115.3 | 15 | 214.5 | 239 | 73.6 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 149.700 | 49 | 14-May-07 | 116.2 | B | Nechako River |  |  |  |  |
| 149.700 | 49 | 16-May-07 | 116 | A |  |  |  |  |  |
| 149.700 | 49 | 20-May-07 | 117 | A |  |  |  |  |  |
| 149.700 | 49 | 23-May-07 | 132 | A |  |  |  |  |  |
| 149.700 | 49 | 28-May-07 | 129 | A |  |  |  |  |  |
| 149.700 | 49 | 30-May-07 | 135.7 | GS |  |  |  |  |  |
| 149.700 | 49 | 30-May-07 | 135.7 | GS |  |  |  |  |  |
| 149.700 | 49 | 30-May-07 | 136 | A |  |  |  |  |  |
| 149.700 | 49 | 01-Jun-07 | 135.7 | GS |  |  |  |  |  |
| 149.700 | 49 | 02-Jun-07 | 135.7 | GS |  |  |  |  |  |
| 149.700 | 49 | 03-Jun-07 | 135.7 | GS |  |  |  |  |  |
| 149.700 | 49 | 07-Jon-07 | 89.7 | GS |  |  |  |  |  |
| 149.700 | 49 | 27-Jun-07 | 104.2 | GS | STUART RIVER |  |  |  |  |

- Fish was originally tagged at km 115 in May 2007 and assessed as a ripe female (code 15).
- Fish migrated to VH spawning area and remained there from May $8^{\text {th }}$ to $11^{\text {th }}$. It then migrated back to rearing habitats ( km 116 and 129) from May $14^{\text {th }}$ to $30^{\text {th }}$ presumably as a result of conditions (i.e. temperature) being not yet appropriate for spawning.
- Fish returned to VH spawning area on May $30^{\text {th }}$ and remained till June $3^{\text {rd }}$, therefore is assumed to have spawned during observed congregation (June $2^{\text {nd }}$ ).
- Following spawning fish moved downstream to the Stuart and was identified at km 104 in the Stuart on June $27^{\text {th }}$. Fish moved into Stuart Lake.
- Rated end of tag life is December 2011


- Fish was tagged at km 116 in Sept 2005 and assessed as a code 12 female. Fish remained at km 116 till May $11^{\text {th }} 2006$ and migrated downstream to the Nechako confluence (July $8^{\text {th }}, 2006$ ). Fish entered the Fraser and was not detected again until Sept $3^{\text {rd }} 2007$ at the Stuart confluence.
- Fish has not been identified at the VH spawning area.
- Rated end of tag life is April 2010.

- Fish was originally captured at km 129 in May 2006 and assessed as a code 13 female. Through 2006 fish remained at km 125 and did not migrate to the VH spawning area.
- In 2007, fish migrated to the VH spawning area on May $29^{\text {th }}$ and remained through June $8^{\text {th }}$, which corresponds to the period where spawning was observed at that location. On June $5^{\text {th }}$ it made a migration to the Braeside area ( km 162 ) where a smaller congregation was observed. Based on this data it is likely that the fish spawned in 2007. Following spawning fish returned to rearing habitats at km 116 and 125.
- Rated end of tag life is December 2010

- Fish was originally captured at km 111 in May 2007 and assessed as a ripe female (code 15). Following tagging fish migrated to the VH spawning area on May $28^{\text {th }}$ and remained until June $4^{\text {th }}$, which corresponds to the period when spawning was observed at that location. As a result fish likely spawned.
- Following spawning fish migrated to rearing habitat at km 110.
- Rated end of tag life is December 2011

- Fish was originally captured at km 115 in Sept 2005 and assessed as a code 2 male. Likely overwintered at km 116 in 2005/2006.
- Telemetry data shows the fish has primarily been found at rearing habitats such as $\mathrm{km} \mathrm{105,110}$, and 122. All migrations are thought to be for rearing and feeding purposes.
- Fish has not been identified at the VH spawning area.
- Rated end of tag life is April 2010.

- Fish originally captured at km 129 in May 2006 and assessed as a ripe male (code 5). However, telemetry shows it moved to km 134 but did not migrate
to the VH spawning area. As a result it likely did not spawn in 2006.
- In 2007, fish was identified at the VH spawning area on May $15^{\text {th }}$ and $24^{\text {th }}$ but migrated upstream to km 192 (Nautley confluence) on June $4^{\text {th }}$. Fish was not detected at VH on June $2^{\text {nd }}$ when spawning was observed and therefore likely did not spawn at that location.
- Fish remained upstream of Braeside but made migrations to km 145 on June $18^{\text {th }}$ and $27^{\text {th }}$ and to km 165 on July $4^{\text {th }}$ likely for rearing.
- Fish may have briefly entered Fraser Lake but returned to km 135 on Sept $6^{\text {th }}$ suggesting it did not overwinter upstream.
- Rated end of tag life is December 2010.

- Fish captured at km 116 in May 2007 and assessed at a ripe female (code 15). Taken as brood stock for 2007 hatchery program (female \#1).
- Following release fish moved downstream to the Stuart confluence.
- Rated end of tag life is January 2012.

| PITtag |  | Capture Date | River Km | Sex | FL(cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 452A4D4A58 |  | 18/05/2006 | 132.1 | 15 | 230 | 262 | 100 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 149.440 | 10 | 13-Jun-06 | 110 | A | NECHAKO RIVER |  |  |  |  |
| 149.440 | 10 | 10-Ag-06 | 98 | A |  |  |  |  |  |
| 149.440 | 10 | 28-Jun-07 | 104.2 | GS | STUART RIVER |  |  |  |  |

- Fish captured at km 132 in May 2006 and assessed as a ripe female (code 15). Taken as brood stock for 2006 hatchery program (female \#2).
- Following release fish moved downstream to the Stuart River ( km 104 , June $28^{\text {th }}$ ) and may have moved into Stuart Lake.
- Rated end of tag life is June 2008.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 501F635709 |  | 09/09/2004 | Stuart Lake | 3 | 173196 | 37.053 | 30 | 1974 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |
| 148.420 | 15 | 07-Sep-04 | 110 | B | StUART LAKE |  |  |  |
| 148.420 | 15 | $24-\mathrm{Jun}-05$ | 104.2 | GS | STUART RIVER |  |  |  |
| 148.420 | 15 | $24-\mathrm{Jul}-05$ | 104.2 | GS | STUART RIVER |  |  |  |
| 148.420 | 15 | 04-Jul-07 | 104.2 | GS | STUART RIVER |  |  |  |
| 148.420 | 15 | 02-Aug-07 | 89.7 | GS | NECHAKO RIVER |  |  |  |
| 148.420 | 15 | 03-Aug-07 | 89.7 | GS |  |  |  |  |
| 148.420 | 15 | 21-Aug-07 | 135.7 | GS |  |  |  |  |
| 148.420 | 15 | 22-Aug-07 | 135.7 | GS |  |  |  |  |

- Fish captured in Stuart Lake in Sept 2004 and assessed as a code 3 male. Telemetry shows it moved out of Stuart Lake in June 2005 and back into Stuart lake July 2005 where it remained until July 2007 when it moved into the Nechako (km 104) by July $24^{\text {th }}, 2005$.
- No telemetry data exists for 2006 and fish may have returned to Stuart Lake as it was detected in the Stuart River (km 104) on July $4^{\text {th }}$, 2007. In August 2007 fish moved into the Nechako and migrated upstream to the VH spawning area on August $21^{\text {st }}$. As this is outside of the normal spawning window, migration is assumed to be associated with rearing.
- Rated end of tag life is April 2009.


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 6 | 18-May-04 | 134 | A |  |
| 149.700 | 6 | 25-May-04 | 85 | A |  |
| 149.800 | 45 | 18-May-06 | 132 | A |  |
| 149.800 | 45 | 13-Jun-06 | 30 | A |  |
| 149.800 | 45 | 27-Jun-06 | 30 | A |  |
| 149.800 | 45 | 10-Aug-06 | 35 | A |  |
| 149.800 | 45 | 21-Sep-06 | 89.7 | GS |  |
| 149.800 | 45 | 05-May-07 | 116 | A |  |
| 149.800 | 45 | 10-May-07 | 114 | A |  |
| 149.800 | 45 | 16-May-07 | 129 | A |  |
| 149.800 | 45 | 20-May-07 | 128 | A |  |
| 149.800 | 45 | 23-May-07 | 133 | A |  |
| 149.800 | 45 | 25-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 25-May-07 | 134 | A |  |
| 149.800 | 45 | 26-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 26-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 26-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 27-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 28-May-07 | 135 | A |  |
| 149.800 | 45 | 28-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 28-May-07 | 135.7 | GS |  |
| 149.800 | 45 | 30-May-07 | 137 | A |  |
| 149.800 | 45 | 01-Jun-07 | 135 | A |  |
| 149.800 | 45 | 07-Sep-07 | 89.7 | GS |  |

- In 2002, 2003 and 2006 fish was identified in the vicinity of km 30 for several weeks each time. This suggests rearing and feeding habitats may exist in this area.
- In 2002, 2003, 2004, 2006 and 2007 fish was identified in the vicinity of the known VH spawning location in May and June. In particular, for 2004-2007, the fish was identified close to the spawning site (i.e. $\mathrm{km} 132-135$ ) either on the day of spawning or the day before spawning was observed.
- Very active fish that should therefore be targeted for continued telemetry.
- Estimated end of tag life is December 2010.


| 148.380 | 2 | 31-May-06 | 115 | A |
| :---: | :---: | :---: | :---: | :---: |
| 148.380 | 2 | 31-May-06 | 115 | A |
| 148.380 | 2 | 31-May-06 | 115 | A |
| 148.380 | 2 | 06-Jun-06 | 110 | A |
| 148.380 | 2 | 06-Jun-06 | 110 | A |
| 148.380 | 2 | 06-Jun-06 | 110 | A |
| 148.380 | 2 | 13-Jun-06 | 124 | A |
| 148.380 | 2 | 13-Jun-06 | 124 | A |
| 148.380 | 2 | 13-Jun-06 | 124 | A |
| 148.380 | 2 | 27-Jun-06 | 110 | A |
| 148.380 | 2 | 27-Jun-06 | 110 | A |
| 148.380 | 2 | 27-Jun-06 | 110 | A |
| 148.380 | 2 | 10-Aug-06 | 118 | A |
| 148.380 | 2 | 10-Aug-06 | 118 | A |
| 148.380 | 2 | 10-Aug-06 | 118 | A |
| 148.380 | 2 | 16-May-07 | 117 | A |
| 148.380 | 2 | 16-May-07 | 117 | A |
| 148.380 | 2 | 16-May-07 | 117 | A |
| 148.380 | 2 | 20-May-07 | 119 | A |
| 148.380 | 2 | 20-May-07 | 119 | A |
| 148.380 | 2 | 20-May-07 | 119 | A |
| 148.380 | 2 | 23-May-07 | 116 | A |
| 148.380 | 2 | 23-May-07 | 116 | A |
| 148.380 | 2 | 23-May-07 | 116 | A |
| 148.380 | 2 | 28-May-07 | 122 | A |
| 148.380 | 2 | 28-May-07 | 122 | A |
| 148.380 | 2 | 28-May-07 | 122 | A |
| 148.380 | 2 | 03-Jun-07 | 119 | A |
| 148.380 | 2 | 03-Jun-07 | 119 | A |
| 148.380 | 2 | 03-Jun-07 | 119 | A |
| 148.380 | 2 | 08-Jun-07 | 119 | A |
| 148.380 | 2 | 08-Jun-07 | 119 | A |
| 148.380 | 2 | 08-Jun-07 | 119 | A |
| 148.380 | 2 | 11-Jun-07 | 119 | A |
| 148.380 | 2 | 11-Jun-07 | 119 | A |
| 148.380 | 2 | 11-Jun-07 | 119 | A |
| 148.380 | 2 | 13-Jun-07 | 119 | A |
| 148.380 | 2 | 13-Jun-07 | 119 | A |
| 148.380 | 2 | 13-Jun-07 | 119 | A |
| 148.380 | 2 | 15-Jun-07 | 120 | A |
| 148.380 | 2 | 15-Jun-07 | 120 | A |
| 148.380 | 2 | 15-Jun-07 | 120 | A |
| 148.380 | 2 | 18-Jun-07 | 121 | A |
| 148.380 | 2 | 18-Jun-07 | 121 | A |
| 148.380 | 2 | 18-Jun-07 | 121 | A |
| 148.380 | 2 | $27-$ Jun-07 | 122 | A |
| 148.380 | 2 | 27-Jun-07 | 122 | A |
| 148.380 | 2 | 27-Jun-07 | 122 | A |
| 148.380 | 2 | 06-Jul-07 | 118 | A |
| 148.380 | 2 | 06-Jul-07 | 118 | A |
| 148.380 | 2 | 06-Jul-07 | 118 | A |


| 148.380 | 2 | 16-Jul-07 | 117 | A |
| :--- | :--- | :--- | :--- | :--- |
| 148.380 | 2 | 16-Jul-07 | 117 | A |
| 148.380 | 2 | 16-Jul-07 | 117 | A |

- Juvenile fish that has never been identified in the vicinity of the VH spawning area.
- Has been identified briefly in the Stuart River (May 26, 2002)
- Estimated end of tag life is April 2009.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{5 0 2 0 2 4 3 9 1 5}$ | $29 / 08 / 2004$ | 110.1 | 98 | 85 | 97 | 3.765 | 10 | 1994 |  |
| $\mathbf{5 0 2 0 2 4 3 9 1 5}$ | $01 / 09 / 2006$ | 114.8 | 97 | 97 | 109.5 | 5.645 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| PITtag | Capture Date | River Km | Sex | $\boldsymbol{F L}(\boldsymbol{c m})$ | $\boldsymbol{T L}(\boldsymbol{c m})$ | $\boldsymbol{W T}(\boldsymbol{k g})$ | Age | Birth Year |  |
| $\mathbf{5 0 2 7 5 1 2 B 1 2}$ | $15 / 07 / 2000$ | 0.4 | 97 | 93 | 107 | 6.075 | 15 | 1985 |  |
|  | $21 / 07 / 2001$ | 0.3 | 97 | 100 | 113.5 | 7.2 |  |  |  |



| 148.420 | 14 | 31-May-07 | 104.2 | GS | STUART RIVER |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 148.420 | 14 | 31-May-07 | 104.2 | GS |  |

- Fish was originally captured in Stuart Lake, however, telemetry data is from the Nechako predominantly with the exception of records from Stuart River on May $31^{\text {st }}$, 2007 which suggest it returned to Stuart Lake.
- Potential issue with biological data since length, weight, and sexual maturity stage all decrease between first and second capture.
- Never identified at the known VH spawning area.
- Rated end of tag life is May 2009.

- In 2006 fish was assessed as code 12 female and was not identified in vicinity of VH spawning area.
- In 2007, fish was identified at the VH spawning area between June $2^{\text {nd }}$ and $5^{\text {th }}$ (period when eggs were collected) and was also identified at the Braeside location on June $8^{\text {th }}$.
- Following the spawning period in 2007, fish migrated to km 125 area for rearing and potentially overwintering.
- Rated end of tag life is December 2010.


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 15 | 05-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 06-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 07-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 10-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 11-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 11-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 16-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 17-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 19-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 20-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 21-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 22-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 24-Jun-04 | 116 | GS |  |
| 149.700 | 15 | 10-Jul-04 | 116 | GS |  |
| 149.700 | 15 | 13-Jul-04 | 116 | GS |  |
| 149.700 | 15 | 14-Mar-06 | 116.2 | S | STUART RIVER |
| 149.700 | 15 | 10-Aug-06 | 110 | A | SECHAKO RIVER |
| 149.700 | 15 | 16-May-07 | 130 | A | NEHAR |

- Fish was captured at km 116 in Oct 2001 and assessed as a code 4 male suggesting it would be ready to spawn in 2002.
- Telemetry records show the fish mainly located at km 116 however, was in the vicinity of the VH spawning area on May $26^{\text {th }}-28^{\text {th }}, 2003$ and May $18^{\text {th }}$ 2004. The 2004 date corresponds to an observed spawning congregation and therefore the fish likely spawned that time at least.
- In 2006 it was identified at $\mathrm{km} 116\left(\mathrm{Mar} 14^{\text {th }}\right)$ and in the Stuart River ( km 110 Aug $10^{\text {th }}$ ). It was not identified at the VH spawning area and likely did not spawn that year.
- In 2007 it was identified back in the Nechako at km 130 on May $16^{\text {th }}$ but was not identified at the VH spawning area during the observed spawning event on June $2^{\text {nd }}$.
- Rated end of tag life was Nov 2003 so it is possible tag died following May 2007 ID.

$\begin{aligned} & 149.480\end{aligned} \quad 56 \quad 15-\mathrm{Jun}-99 \quad 103.5 \quad \mathrm{~B} \quad$ - Fish has been captured twice in the vicinity of km 72 and once near the confluence of the Stuart River.
- All telemetry records were limited to the area upstream and downstream of the Stuart River confluence from km 66 to 104.
- Fish appears to have overwintered at km 104 in 1997 , however, there is the possibility the tag was shed at that location.
- Fish was never identified in the vic inity of the known spawning area at VH.

- Fish was tagged at km 124.9 in Sept 1995 and assessed as a code 13 female. Telemetry shows fish remained at km 124.6 that winter but moved to km 116 in Apr. After a brief migration to km 112 (feeding) fish returned to km 116 on May $28^{\text {th }}$ and remained at that location. Due to lack of movement tag likely shed.
- Fish was never identified at the VH spawning area.

- Fish was originally tagged at km 88 in June 1996 and assessed as a code 2 male. After migrating to rearing habitats at km 124 (July $29^{\text {th }}$ ) and then to km 116 (Aug $9^{\text {th }}$ ) fish did not show any other movements. Tag likely shed.
- Fish was not identified at VH spawning area.

- Fish tagged at km 124 in Sept 1997 and assessed as code 2 male. Telemetry data shows the fish at km 125 in May 1998 but migrated to km 98 in June and remained there through August; presumably for feeding.
- Fish returned to km 124 and likely overwintered there. In 1999 fish was located at km 98.
- Fish was never identified at VH spawning area.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7B031511 |  | 03/09/1998 | 114.9 | 4 | 183204 | 46.8 | 47 | 1951 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |
| 149.740 | 15 | 03-Sep-98 | 114.9 | B | NECHAKO RIVER |  |  |  |
| 149.740 | 15 | 04 -Sep-98 | 116.2 | B |  |  |  |  |
| 149.740 | 15 | 09-Nov-98 | 116.2 | A |  |  |  |  |
| 149.740 | 15 | 22-Apr-99 | 116 | A |  |  |  |  |
| 149.740 | 15 | 27-May-99 | 116.2 | A |  |  |  |  |
| 149.740 | 15 | 08-Jun-99 | 116.2 | A |  |  |  |  |
| 149.740 | 15 | 22-Jun-99 | 116.2 | A |  |  |  |  |
| 149.740 | 15 | 09-Jul-99 | 116.2 | A |  |  |  |  |
| 149.740 | 15 | 04-Aug-99 | 116.2 | A |  |  |  |  |

- Fish was tagged at km 114 in Sept 1998 and assessed as a code 4 male suggesting it may have matured (code 5) in 1999.
- Telemetry data never left km 116 and as a result tag is suspect to have been shed.

- Tag likely shed.
- Fish was assessed as code 4 in Sept of 1995 therefore was likely ripe (code 5) in 1996.

- Fish was originally captured in Sept 1997 at km 110 and assessed as a code 2 male. Fish was recaptured in Oct 2007 in the Fraser (10.553994.6006890) and assessed as a code 2 or 3 male.
- Telemetry data shows fish migrated to km 175 in April 1999 and remained there through the summer (rearing habitat most likely).
- Fish tagged in 2007 with 148.400 code 54.

- Fish was tagged at km 115 in Sept 1997 and assessed as a code 12 female. However, tag likely shed as fish did not move from that location.

- Fish assessed as code 4 in Sept of 2005 however was not identified at the spawning area in VH during the observed spawning event in 2006 (May 19-22 ${ }^{\text {nd }}$ ).
- In 2007, fish was identified at the VH spawning area from June $2^{\text {nd }}-4^{\text {th }}$ which coincides with the period when eggs were collected. In addition, the fish was identified at km 157, downstream of Braeside on June $5^{\text {th }}$.
- By the middle of July, the fish had moved downstream to km 119 and could potentially be overwintering at km 116 (which is where it was captured in 2005).
- Rated end of tag life is April 2010.


- Fish was assessed as code 14 in Sept of 1996 and telemetry in 1997 identified it at km 132 (approximately $4 \mathrm{~km} \mathrm{~d} / \mathrm{s}$ of the VH spawning area) beginning May $23^{\text {rd }}$. However tag is recorded at that same location until Nov 1998 and there is the possibility that it was shed. The initial movement of the fish from overwintering/rearing habitat at km 116 and 110 in the spring of 1997 to km 132 suggests a spawning migration however, the potential date of spawning cannot be confirmed from the data.
- Fish was recaptured in Sept of 2005 and again assessed as code 14 . However, telemetry did not identify it at the VH spawning area in 2006 suggesting fish may not have reached maturity that year. Records from km 45 from June 13-27 ${ }^{\text {th }}, 2006$ suggest this area may provide rearing habitat.
- Fish was captured a third time in May 2007 and assessed as being ripe (code 15). Taken as brood stock for 2007 hatchery program (female 4).
-Telemetry identify it at the VH spawning area from June $3-6^{\text {th }}$ which coincides with the time when eggs were collected however due to being used as brood stock it is unlikely it spawned. Following release, the fish moved downstream to km 116 and as of July $21^{\text {st }}$ was located at the Stuart River Confluence.
- Rated end of tag life is October 2007 therefore tag may be dead in 2008.


[^2]- Fish has never been identified at the known spawning area at VH.
- From May $23^{\text {rd }}, 1997$ to August $29^{\text {th }}, 1998$ fish was located in the Stuart River predominantly at km 71.
- Fish was most recently captured in Sept 1998 at km 116 and was assessed as code 2.

- Fish originally tagged at km 115 in Sept 1998 and assessed as code 13 female. Telemetry shows it remained at km 116 through Jan 1999 before migrating downstream.
- From June $6^{\text {th }}$ to Aug $4^{\text {th }} 1999$ fish was located between km 51 and 40 where summer feeding/rearing habitat is found.
- Fish was never identified at the VH spawning area.

- Fish was tagged at km 66 and assessed as code 3 but all telemetry data from km 116. Tag likely shed at that location.
- Fish never identified at VH spawning area.

| PITtag |  | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7B04052A |  | 16/09/1995 | 115.2 | 3 | 153 | 187 | 35.866 | 40 | 1955 |
| 7F7B04052A |  | 17/09/2005 | 116.2 | 3 | 188 | 214 | 54.4 |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 149.700 | 39 | 17-Sep-05 | 116.2 | B | NECHAKO RIVER |  |  |  |  |
| 149.700 | 39 | 25-Oct-05 | 116.2 | B |  |  |  |  |  |
| 149.700 | 39 | 14-Mar-06 | 116.2 | S |  |  |  |  |  |
| 149.700 | 39 | 01-May-06 | 116.2 | A |  |  |  |  |  |
| 149.700 | 39 | 13-Jun-06 | 10 | A | STUART RIVER |  |  |  |  |
| 149.700 | 39 | 11-May-07 | 89.7 | GS | NECHAKO RIVER |  |  |  |  |
| 149.700 | 39 | 14-Sep-07 | 89.7 | GS |  |  |  |  |  |

- Fish has been captured twice at km 116 (Sept 1995 and 2005) and was assessed as code 3 both times.
- Has never been identified at the known spawning area at VH and has been located either within the Stuart River (June 13, 2006) or near the confluence (May and Sept, 2007).
- Rated end of tag life is April 2010.


- Fish tagged at km 125 in Sept 1995 and assessed as a code 12 female. Telemetry shows it overwintered at km 124 that year and moved to km 137 by July $29^{\text {th }} 1996$. Tag was likely shed at that location as it did not move through November 1998.
- Original migration to km 135 is not considered a spawning migration due to the timing being outside the observed spawning window.

- Fish originally captured at km 68 in Sept 1998 and was assessed as a code 12 female. In January 1999 fish was identified at overwintering habitat at km 124. One record places the fish at km 10.4 on May $17^{\text {th }}$ however, this may be a data entry error as the records before and after are from km 110 .
- On May $27^{\text {th }}$ fish migrated upstream to km 157 and was located at km 160 from June to August 1999.

- Fish was originally tagged at km 125 in Sept 1998 and assessed as a code 12 female. Telemetry data shows it remained at km 125 following tagging and may have overwintered at that location.
- In 1999, fish migrated to km 141 on May $27^{\text {th }}$ and remained there through August $4^{\text {th }}$. The motivation for the migration is unclear but could potentially be associated with spawning (based on time of year) or rearing. Tag likely shed at that location.

- Fish assessed as code 4 in Sept 2005 but was not identified at the VH spawning area during the observed spawning event in 2006 (May 19-22 ${ }^{\text {nd }}$ ). During that period the fish was close ( $\mathrm{km132}-134$ ) and therefore spawning cannot be ruled out.
- In 2007, fish was identified at the VH spawning area prior to the period when eggs were collected and may have taken part in spawning event that resulted in eggs being collected on June $2^{\text {nd }}$. Following the spawning event, the fish moved $\mathrm{d} / \mathrm{s}$ to km 130 and then returned to the spawning area at the end of August.

- Fish was originally captured at km 92 in June of 1996 and assessed as a code 3 male. Telemetry data shows it moved upstream to $\mathrm{km} 107 \mathrm{by} \mathrm{Sept} 8^{\text {th }}$ but tag was likely shed at that location and no other movements were identified.
- Fish was never identified at VH spawning area.

- Fish originally captured at km 116 in Sept 1997 and was assessed as a code 4 male suggesting it may be mature (code 5) the following year.
- Telemetry date shows it overwintered at km 116 and migrated to km 125 on May $8^{\text {th }}$. The tag was likely shed at that location as it never moved. Based on the time of year the fish may have continued upstream to the VH spawning area and spawned but cannot be confirmed.

- Captured at km 124 in 98 (code 4) and overwintered at km 116.
- Tag likely shed at km 116 as no telemetry records exist fromother locations.
- Fish recaptured in June 2002 at km 91.4.
- Assessed as code 5 in May 2006. Fish was taken as brood stock for 2006 hatchery program (male 5). Fish was released at km 134 on May $22^{\text {nd }}$, which was the end of the observed spawning congregation.
- In 2007 fish was also identified at VH spawning area on June 2 which corresponds to when eggs were collected.
- Fish has been identified near the Stuart confluence (Sept 2006 to May 2007) and may be overwintering in that area.
- Fish has also been identified at km 32 in Aug 06 suggesting a potential rearing/feeding habitat in that area
- Rated end of tag life is December 2010.

- Fish originally captured at km 125 in Sept 1995 and was assessed as a code 2 male. Telemetry shows it remained at km 124 through the winter and migrated to km 132 on April $27^{\text {hh }} 1996$.
- Fish moved to the vicinity of the VH spawning area on May $3^{\text {rd }}$ but tag likely shed at that location (possibly around June $17^{\text {th }}$ ). Migration likely associated with spawning although based on maturity of the fish it may have been responding to the spawning cues but not actually spawning.

- Fish originally captured at km 129 in June of 1996 and assessed as a code 2 male. Telemetry shows it moved to km 116 on July $2{ }^{\text {th }}$ and tag was likely shed at that location.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7B0C3010 | $16 / 09 / 1995$ | 114.9 | 3 | 175.5 | 198 | 50.394 | 42 | 1953 |
|  | $13 / 07 / 2002$ | 0.3 | 97 | 193 | 217 | 57.7 |  |  |
|  |  |  |  |  |  |  |  |  |
| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| 7F7B0C3231 | $10 / 06 / 1995$ | 92.4 | 98 | 130.5 | 147 | 16.783 | 31 | 1964 |
|  | $14 / 09 / 1999$ | 66.2 | 97 | 145 | 164 | 22.7 |  |  |
|  | $28 / 09 / 2001$ | 125.2 | 97 | 151.5 | 170.5 | 24.9 |  |  |
|  |  |  |  |  |  |  |  |  |
| PITtag | Capture Date | River Km | Sex | FL(cm) | TL (cm) | WT (kg) | Age | Birth Year |
| 7F7B0C4A13 | $22 / 06 / 1998$ | 117.3 | 97 | 192.5 | 217.5 | 56.3 | 46 | 1952 |
|  | $04 / 09 / 1998$ | 116.8 | 3 | 192.5 | 217.5 | 55.8 |  |  |



- Fish originally captured at km 47 in July of 1996 and assessed as a code 3 male. Subsequent captures have identified the fish as a female (code 14).
- Fish was re-captured in June 1998 and assessed as code 14 female. Fish moved to km 116 following tagging and it is suspected that the tag was shed as it remained at that location until Aug 1999.
- Fish was captured a third time in July of $2002 \mathrm{~d} / \mathrm{s}$ of the Stuart River confluence ( km 88 ) and was assessed as code 14. Fish remained at km 88 following tagging and overwintered at km 116.
- In 2003 fish could potentially have been nearing spawning maturity, however was not identified at the known spawning area at VH. Instead fish was at km 76 on May $26^{\text {th }}$ (date congregation observed) and was also identified at km 38 on June 17, 2003 (likely rearing/feeding migration).
- Tag has likely expired as fish has not been detected since October 2003 (km 116 overwintering hole).

- Fish was originally captured at km 109 in Sept 1996 and assessed as a code 14 female suggesting it may be ripe (code 15) in 1997). Telemetry shows it moved to km 116 after tagging and remained there till April $21^{\text {st }} 1997$.
- In May it began to move downstream and on the $23^{\text {rd }}$ was identified at km 51.5 . On June $4^{\text {th }}$ it was located at km 97.1 . This is the period when spawning would likely occur so there is the possibility that spawning habitat exists between km 51 and 97 .
- On June $16^{\text {th }}$ the fish was identified in the Stuart River ( km 6.5 ) and tag may have been shed at that location.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7B0C4C09 | $07 / 09 / 1998$ | 124.7 | 3 | 143 | 159 | 21.8 | 39 | 1959 |
|  | $09 / 09 / 1999$ | 125 | 98 | 146 | 163 | 23.1 |  |  |
|  | $01 / 10 / 2001$ | 116.2 | 3 | 151.5 | 169 | 26.8 |  |  |

- Fish captured twice at km 125 and twice at 116.
- Maturity of code 3 in 2005 (estimated age of 46) suggests fish likely nearing reproductive age and could be a good candidate for a radio tag if captured again.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7B0C4C4E | $05 / 09 / 1998$ | 124.9 | 2 | 139.5 | 159 | 16.3 | 37 | 1961 |
| 7F7B0C4C4E | $05 / 09 / 1998$ | 124.9 | 4 | 204 | 217 | 65.4 | 47 | 1951 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |
| 149.740 | 14 | $05-S e p-98$ | 124.9 | B | NECHAKO RIVER |  |  |  |

NECHAKO RIVER

| 149.740 | 14 | 09-Nov-98 | 116.2 | A |
| :---: | :---: | :---: | :---: | :---: |
| 149.740 | 14 | 13-Jan-99 | 116.2 | S |


| 149.740 | 14 |
| :--- | :--- |
| 149.740 | 14 |

149.740
149.740
149.740
149.740
149.740
-Database issue. Two records of same tag on
same day with different length, weight etc.
-Telemetry did not identify fish at VH spawning area.
$\bullet$ Fish was identified at km 128 May - July 1999.


- Fish has been captured 4 times and was most recently assessed as a code 12 female (Sept 2005).
- Has never been identified at the known spawning area at VH although was at km 132 on May $25^{\text {th }}, 2007$. However, by June $3^{\text {rd }}$ it had moved down to km 107 and therefore was not likely part of the 2007 spawning event.
- In July and Sept of 2007 it was identified at the Stuart River confluence and may be overwintering in that area.
- Rated end of tag life is April 2010.

- Fish was originally captured at km 110 in June 1998 and was assessed as a code 12 female. Telemetry shows it moved to km 116 on August $29^{\text {th }}$ and tag was likely shed at that location.

- Fish has been captured twice at km 116 (Sept 1995 and 2001). Was assesses as code 4 in Sept 1995 suggesting it may be mature (code 5) in 1996.
- Telemetry data from 1996 show the fish migrating to the vicinity of the VH spawning area on May $28^{\text {th }}$ and remaining there.
- Tag may have been shed at km 136.


- Fish was originally assessed as a code 2 (male) in May 2006 but changed to a code 13 (female).
- In 2006, fish was identified at km 133 on May $16^{\text {th }}, 3$ days prior to the congregation being observed. However, fish was not identified by the VH base station and therefore was not likely part of the spawning congregation.
- In 2007, the fish was at km 136 on June $1^{\text {st }}$ (day before eggs were collected) and could potentially have been involved in spawning but was not identified by basestation.
- Fish remained in vicinity of VH until last telemetry record on July $11^{\text {th }}$.

- Fish has been captured 4 times (twice each at km 116 and 125). In Sept 2005 fish was assessed as being code 4 suggesting it may be ready to spawn in 2006 or 2007.
- In 2006 the fish was identified at km 125 on May $12^{\text {th }}, 7$ days prior to the observed spawning event at VH. The fish was not identified by the basestation or from aerial surveys of the congregation and therefore is assumed to not have spawned. In August, fish migrated to km 89 and may have overwintered in that area.
- In 2007 fish was identified at km 132 on May $5^{\text {th }}$ but subsequent telemetry data suggest it began moving downstream eventually ending up at the Stuart confluence on Aug $12^{\text {th }}$.
- During the period in 2007 when eggs were collected at VH , the fish was located in the vicinity of km 116 suggesting it did not spawn.
- Potential spawner in 2008.
- Rated end of tag life is April 2010.


| Frequency | Code | Telem. Date | River Km | Station | River |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 148.380 | 3 | 01-May-06 | 116.2 | A |  |
| 148.380 | 3 | 13-May-06 | 116.2 | B |  |
| 148.380 | 3 | 13-May-06 | 116.2 | B |  |
| 148.380 | 3 | 14-May-06 | 116.2 | B |  |
| 148.380 | 3 | 14-May-06 | 116.2 | B |  |
| 148.380 | 3 | 17-May-06 | 116.2 | B |  |
| 148.380 | 3 | 17-May-06 | 116.2 | B |  |
| 148.380 | 3 | 27-Jun-06 | 116 | A |  |
| 148.380 | 3 | 27-Jun-06 | 116 | A |  |
| 148.380 | 3 | 10-Aug-06 | 118 | A |  |
| 148.380 | 3 | 10-Aug-06 | 118 | A |  |
| 148.380 | 3 | 16-May-07 | 125.1 | B |  |
| 148.380 | 3 | 16-May-07 | 125.1 | B |  |
| 148.380 | 3 | 23-May-07 | 125 | A |  |
| 148.380 | 3 | 23-May-07 | 125 | A |  |
| 148.380 | 3 | 30-May-07 | 125 | A |  |
| 148.380 | 3 | 30-May-07 | 125 | A |  |
| 148.380 | 3 | 11-Jun-07 | 121 | A |  |
| 148.380 | 3 | 11-Jun-07 | 121 | A |  |
| 148.380 | 3 | 27-Jun-07 | 105 | A |  |
| 148.380 | 3 | 27-Jun-07 | 105 | A |  |
| 148.380 | 3 | 11-Jul-07 | 93 | A |  |
| 148.380 | 3 | 11-Jul-07 | 93 | A |  |
| 148.380 | 3 | 16-Jul-07 | 95 | A |  |
| 148.380 | 3 | 16-Jul-07 | 95 | A |  |
| 148.380 | 3 | 23-Jul-07 | 89.7 | GS |  |
| 148.380 | 3 | 23-Jul-07 | 89.7 | GS |  |
| 148.380 | 3 | 28-Jul-07 | 104.2 | GS | STUART RIVER |
| 148.380 | 3 | 28-Jul-07 | 104.2 | GS |  |

- Fish has been captured 3 times (Sept 1996, 2002 and 2005). It was assessed as code 12 each time. In 1996 it was located in the Nechako at km 116 but from 2002 to May 2004 it was located in Stuart Lake. In July 2004 the fish moved into the Stuart and by July $19^{\text {th }}$ was back in the Nechako.
- Fish remained in the Nechako from July 2004 to July 2007, predominantly at km 116 or 125. It was never detected at the spawning area at VH.
- On July $28^{\text {th }}$ the fish was once again in the Stuart River at km 104 and may have returned to Stuart Lake.
- Rated end of tag life was May 2007 therefore tag has already surpassed its rated lifespan.



| 149.700 | 1 | 29-Jun-02 | 75.1 | B |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 1 | 01-Jul-02 | 75 | B |  |
| Frequency | Code | Telem. Date | River Km | Station | River |
| 149.700 | 1 | 03-Jul-02 | 75.7 | B |  |
| 149.700 | 1 | 11-Jul-02 | 89.7 | B |  |
| 149.700 | 1 | 17-Jul-02 | 73.6 | A |  |
| 149.700 | 1 | 18-Jul-02 | 73.3 | B |  |
| 149.700 | 1 | 25-Jul-02 | 74 | A |  |
| 149.700 | 1 | 11-Oct-02 | 67.5 | A |  |
| 149.700 | 1 | 26-May-03 | 81.6 | A |  |
| 149.700 | 1 | 11-Jun-03 | 81 | A | STUART RIVER |
| 149.700 | 1 | 11-Jun-03 | 89.7 | GS | NECHAKO RIVER |
| 149.700 | 1 | 13-Jun-03 | 89.7 | GS |  |
| 149.700 | 1 | 19-Jun-03 | 26.9 | A | STUART RIVER |
| 149.700 | 1 | 19-Jun-03 | 26.9 | GS |  |
| 149.700 | 1 | 03-Jul-03 | 76.2 | A | NECHAKO RIVER |
| 149.700 | 1 | 14-Jul-03 | 73.3 | A |  |
| 149.700 | 1 | 31-Jul-03 | 73.2 | A |  |
| 149.700 | 1 | 18-May-04 | 138 | B |  |
| 149.700 | 1 | 18-May-04 | 116 | GS |  |
| 149.700 | 1 | 20-May-04 | 116 | GS |  |
| 149.700 | 1 | 22-May-04 | 116 | GS |  |
| 149.700 | 1 | 05-Jun-04 | 116 | GS |  |
| 149.700 | 1 | 08-Jun-04 | 116 | GS |  |
| 149.700 | 1 | 13-Jun-04 | 136 | GS |  |
| 149.700 | 1 | 16-Jun-04 | 116 | GS |  |
| 149.700 | 1 | 20-Jun-04 | 116 | GS |  |

- Fish has been captured 3 times between km 67 and 79 (Sept 1996, 1998 and 2001).
- In 1996 and 1998 the fish was assessed as a code 2 male and telemetry data shows that it remained downstream of the Stuart River confluence between km 68 and 80. In particular it appears to have overwintered at km 74.4 in 1997.
- In Sept 2001 the fish was assessed as a code 4 male suggesting it would be ripe (code 5) in subsequent years. Telemetry data shows that in spring 2002 it remained in the vicinity of km 79 during the period when spawning would be expected to occur. No obvious spawning migrations were observed.
- In 2003 the fish migrated between km 81 in the Nechako (May $26^{\text {th }}$ ) and km 81 in the Stuart River (June 11). On June $19^{\text {th }}$ the fish was located at km 26.9 in the Stuart River and by July $3{ }^{\text {rd }}$ had returned to the Nechako ( km 76.2 ). The level of movement is consistent with what has been observed of fish nearing sexual maturity, however spawning cannot be confirmed with the data in hand.
- In 2004, the fish was identified at the VH spawning area during the observed spawning congregation (May 18th). Based on this, it took the fish approximately 32 months to mature from code 4 (Sept 2001) to code 5 (Aug 2004).
- The rated end of tag life was April 2006 and as a result the tag is likely dead.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7D4F521F | $12 / 09 / 1996$ | 91.5 | 2 | 133 | 148.5 | 18.2 | 30 | 1966 |
|  | $08 / 09 / 1998$ | 116.2 | 2 | 137.5 | 154.5 | 17.3 |  |  |
|  | $02 / 08 / 2004$ | 0 | 97 | 147 | 163.5 | 24.107 | 38 | 1966 |



- Fish was originally captured at km 116 in Sept of 1996 and assessed as code 2.
- In May of 2006 the fish was recaptured at km 124 and assessed as code 3. Telemetry data from 2006 shows that the fish moved between km 116 and 124 making use of both rearing locations but did not migrate to the VH spawning area.
- In 2007, the fish was quite active making several migrations between km 135 (VH spawning area) and km 162 (Braeside) during the period when eggs were collected at VH. The movements are typical of mature fish during the spawning period and suggest the fish may have spawned in 2007.
Alternatively, the fish may not have been quite mature enough to spawn but was nonetheless responding to spawning cues. Following the spawning period the fish moved back to km 116.
- Capture and assessment in 2008 may be able to confirm if the fish likely spawned in 2007.
- Rated end of tag life is December 2010

- Fish was captured in Sept 1996 at km 125 and assessed as code 17. Fish was recaptured in July 2002 at km 88.7 and assessed as code 97 . Radio tags were not implanted during either capture.
- In May 2006, fish was captured at km 132 and was assessed as being ripe (code 15). Fish was used as brood stock in 2006 (Female \#1) and was released back into the river at km 116 on June $13^{\text {th }}$.
- In 2007, the only telemetry record collected from at km 89 from Sept $12^{\text {th }}$. This suggests that the fish had moved out of the study area for the 2007 Spawning Monitoring Program, which surveyed the Nechako between the confluences of the Stuart and Nautely Rivers.


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| 149.700 | 7 | 11-Jun-03 | 97 | GS |
| :--- | :--- | :---: | :---: | :---: |
| 149.700 | 7 | 17-Jun-03 | 96.3 | A |
| 149.700 | 7 | 03-Jul-03 | 100.4 | A |
| 149.700 | 7 | 14-Jul-03 | 104.4 | A |
| 149.700 | 7 | 31-Jul-03 | 97.7 | A |
| 149.700 | 7 | 28-Apr-04 | 116.2 | B |
| 149.700 | 7 | 04-May-04 | 118.8 | A |
| 149.700 | 7 | 04-May-04 | 118.8 | B |
| 149.700 | 7 | 12-May-04 | 117.5 | A |
| 149.700 | 7 | 15-May-04 | 116 | GS |
| 149.700 | 7 | 18-May-04 | 118.5 | A |
| 149.700 | 7 | 19-May-04 | 116 | GS |
| 149.700 | 7 | 22-May-04 | 116 | GS |
| 149.700 | 7 | 25-May-04 | 117 | A |
| 149.700 | 7 | 25-May-04 | 116 | GS |
| 149.700 | 7 | 26-May-04 | 116 | GS |
| 149.700 | 7 | 28-May-04 | 116 | GS |
| 149.700 | 7 | 29-May-04 | 116 | GS |
| 149.700 | 7 | 03-Jun-04 | 116 | GS |
| 149.700 | 7 | 06-Jun-04 | 116 | GS |
| 149.700 | 7 | 08-Jun-04 | 116 | GS |
| 149.700 | 7 | 09-Jun-04 | 89.7 | GS |
| 149.700 | 7 | 10-Jun-04 | 89.7 | GS |
| 149.700 | 7 | 14-Jul-04 | 89.7 | GS |
| 149.700 | 7 | 17-Jul-04 | 116 | GS |
| 149.700 | 7 | 18-Jul-04 | 116 | GS |

- Fish was captured in Sept of 1996 and 1997 (km 126 and 116, respectively) and assessed as code 12. Telemetry data shows that the fish remained at km 116/115 through Sept 1997.
- Fish was recaptured in Sept 2001 at km 125 and assessed as code 14. Telemetry data through July 2004 identified several movements between km 116 in spring and fall and kms 97 and 89 in June and July (presumably for rearing/feeding).
- Fish has never been identified at the known VH spawning area and tag has not been detected since July 2004 (rated end of tag life was May 2006).


-Was identified at the spawning congregation in 2006 (May 19).
-Was not involved in 2007 spawning event at VH (was located at km 110 during spawning event)
- Estimated end of tag life is April 2010.

- Fish originally captured at km 116 in Sept 1998 and assessed as a code 12 female. Telemetry shows it moved to km 124.9 after tagging and likely overwintered at that location.
- In May 1999 fish moved to km 107 and remained in that are through August $4^{\text {th }}$ 1999. This area likely provides rearing and feeding habitat.

PITtag
7F7D781A4D

| FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: |
| 155 | 177 | 34.5 | 46 | 1949 |
| 158 | 179 | 34.5 |  |  |
| 163 | 185 | 37.2 |  |  |
| 167 | 190 | 36.79 |  |  |
| 178 | 200 | 50 |  |  |

## 21/08/1995

 08/05/1997 22/06/199821/09/2001
17/05/2006

| 116.5 | 97 |
| :---: | :---: |
| 116.2 | 3 |
| 116.2 | 3 |
| 116.2 | 12 |
| 134 | 15 |

7F7D781A4D (female, 46 yrs in 1995, DOB 1949)



| 149.700 | 43 | 28-May-07 | 116 | A |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.700 | 43 | 30-May-07 | 116 | A |  |
| 149.700 | 43 | 30-May-07 | 116 | A |  |
| 149.700 | 43 | 01-Jun-07 | 105 | A |  |
| Frequency | Code | Telem. Date | River Km | Station | River |
| 149.700 | 43 | 01-Jun-07 | 89.7 | GS |  |
| 149.700 | 43 | 01-Jun-07 | 105 | A |  |
| 149.700 | 43 | 01-Jun-07 | 89.7 | GS |  |
| 149.700 | 43 | 03-Jun-07 | 105 | A |  |
| 149.700 | 43 | 03-Jun-07 | 105 | A |  |
| 149.700 | 43 | 08-Jun-07 | 162.1 | A |  |
| 149.700 | 43 | 08-Jun-07 | 162.1 | A |  |
| 149.700 | 43 | 30-Jun-07 | 104.2 | GS | STUART RIVER |
| 149.700 | 43 | 30-Jun-07 | 104.2 | GS |  |
| 149.700 | 43 | 11 -Jul-07 | 104.2 | GS |  |
| 149.700 | 43 | 11-Jul-07 | 104.2 | GS |  |
| 149.700 | 43 | 19-Aug-07 | 89.7 | GS | NECHAKO RIVER |
| 149.700 | 43 | 19-Aug-07 | 89.7 | GS |  |
| 149.700 | 43 | 23-Aug-07 | 89.7 | GS |  |
| 149.700 | 43 | 23-Aug-07 | 89.7 | GS |  |
| 149.700 | 43 | 24-Aug-07 | 89.7 | GS |  |
| 149.700 | 43 | 24-Aug-07 | 89.7 | GS |  |
| 149.700 | 43 | 01-Sep-07 | 89.7 | GS |  |
| 149.700 | 43 | 01-Sep-07 | 89.7 | GS |  |
| 149.700 | 43 | 02-Sep-07 | 89.7 | GS |  |
| 149.700 | 43 | 02-Sep-07 | 89.7 | GS |  |
| 149.700 | 43 | 13-Sep-07 | 89.7 | GS |  |
| 149.700 | 43 | 13-Sep-07 | 89.7 | GS |  |

- Fish was captured in Sept 1997 at km 116 (code 2) as well as in Aug 2004 in Stuart Lake (code 2).
- Fish was re-captured in Sept 2005 at km 116 and assessed as a code 12 (female). A radio tag was implanted and telemetry data shows the fish overwintered at km 116 in 2005.
- In 2006, the fish migrated to the Stuart River confluence ( km 89 ) in the summer and then to km 110 (rearing/overwintering location) in August 2006.
- On May $18^{\text {th }}, 2007$ the fish was identified at the VH spawning area however, returned to km 116 on May $20^{\text {th }}$. On June $1^{\text {st }}$ and $3^{\text {rd }}$ the fish was located at kms 89 (Stuart River confluence) and 105 and therefore was not present at VH at the time when eggs were first collected (June $2^{\text {nd }}$ ) and spawning is assume to have occurred. However, by June $8^{\text {th }}$ the fish had migrated upstream to km 162 (Braeside) where a secondary congregation of fish was observed. No eggs were collected from that area and as a result spawning cannot be confirmed.
- On June $30^{\text {th }}$ the fish had migrated to km 104 of the Stuart River and may have entered Stuart Lake, presumably for feeding. Between August $19^{\text {th }}$ and the last record (Sept 13 ${ }^{\text {th }}$ ) the fish was located at km 89 (Stuart River confluence).

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT ( $\boldsymbol{k g}$ ) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7D784059 | $07709 / 1996$ | 116.2 | 3 | 152 | 171 | 34.05 | 36 | 1960 |
| 7F7D784059 | $11 / 05 / 2006$ | 124.5 | 5 | 180 | 204 | 57 |  |  |



- Fish originally captured in Sept 1996 at km 116 (maturity code 3). Telemetry records show the fish moved from km 116 to km 105 between April and May 1997, presumably for rearing. Tag may have been shed at km 105 as it did not move from that location.
- Fish was recaptured in May 2006 an assessed a ripe (code 5) male. Fish was used as brood stock for the hatchery program (male \#2).


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- Fish was originally located upstream of Braeside at km 179 (maturity code 3) and remained at approx km 170 through Aug 1999 (although tag may have been shed.
- Fish was recaptured in Sept 2005 at km 114.9 (code 3). Fish overwintered at km 116 and was identified in the vicinity of the spawning congregation in 2006. Fish then moved upstream to km 192 to just downstream of the Nautley confluence, likely for feeding and rearing.
- In 2007, fish was located in the vicinity of km 186. Rated end of tag life is May 2010.

| PITtag | Capture Date | River Km | Sex | FL (cm) | TL (cm) | WT (kg) | Age | Birth Year |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7D7A6647 | $13 / 09 / 1998$ | 69.3 | 3 | 158 | 180 | 27.7 | 44 | 1954 |



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| 149.620 | 110 | 17-Nov-97 | 83.5 | A |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 149.620 | 110 | 17-Nov-97 | 83.5 | A |  |
| 149.620 | 110 | 10-Dec-97 | 83.5 | A |  |
| 149.620 | 110 | 10-Dec-97 | 83.5 | A |  |
| 149.620 | 110 | 08-May-98 | 83.5 | A |  |
| Frequency | Code | Telem. Date | River Km | Station | River |
| 149.620 | 110 | 08-May-98 | 83.5 | A |  |
| 149.620 | 110 | 02-Jun-98 | 83.5 | A |  |
| 149.620 | 110 | 02-Jun-98 | 83.5 | A |  |
| 149.620 | 110 | 03-Jul-98 | 83.5 | A |  |
| 149.620 | 110 | 03-Jul-98 | 83.5 | A |  |
| 149.620 | 110 | 29-Aug-98 | 83.5 | A |  |
| 149.620 | 110 | 29-Aug-98 | 83.5 | A |  |
| 149.620 | 110 | 04-Sep-98 | 116.8 | B |  |
| 149.620 | 110 | 04-Sep-98 | 116.8 | B |  |

- Fish has been captured 3 times in the vicinity of km 116 and was assessed as code 13 each time (June 1996, Sept 1998 and 1999).
- Fish has never been identified at the known spawning area in VH.
- Predominantly located approximately 6.5 km downstream of the Stuart River confluence .
- Has not been captured since 1999.

| PITtag |  | Capture Date | River Km | Sex | $F L(c m)$ | $T L$ (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7D7A6A66 |  | $\begin{aligned} & 16 / 09 / 1995 \\ & 17 / 09 / 1997 \end{aligned}$ | $\begin{aligned} & 114.9 \\ & 124.9 \end{aligned}$ | $\begin{aligned} & 3 \\ & 3 \end{aligned}$ | $\begin{gathered} 178 \\ 183.5 \end{gathered}$ | $\begin{gathered} 202 \\ 208.5 \end{gathered}$ | $\begin{gathered} 51.302 \\ 55.4 \end{gathered}$ | 44 | 1951 |
| PITtag |  | Capture Date | River Km | Sex | FL (cm) | $T L$ (cm) | WT (kg) | Age | Birth Year |
| 7F7D7C115E |  | 18/09/1997 | 116.2 | 97 | 167.5 | 190.5 | 36.8 | 37 | 1960 |
| 7F7D7C115E |  | 16/09/2005 | 116.8 | 4 | 181.5 | 208 | 46.3 |  |  |
| 7F7D7C115E |  | 11/05/2006 | 116.2 | 5 |  |  |  |  |  |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |  |
| 149.700 | 33 | 16-Sep-05 | 116.8 | B | NECHAKO | RIVER |  |  |  |
| 149.700 | 33 | 16-Sep-05 | 116.8 | B |  |  |  |  |  |
| 149.700 | 33 | 25-Oct-05 | 116.2 | B |  |  |  |  |  |
| 149.700 | 33 | 25-Oct-05 | 116.2 | B |  |  |  |  |  |
| 149.700 | 33 | 14-Mar-06 | 116.2 | S |  |  |  |  |  |
| 149.700 | 33 | 14-Mar-06 | 116.2 | S |  |  |  |  |  |
| 149.700 | 33 | 06-Apr-06 | 116.2 | S |  |  |  |  |  |
| 149.700 | 33 | 06-Apr-06 | 116.2 | S |  |  |  |  |  |
| 149.700 | 33 | 01-May-06 | 116.2 | A |  |  |  |  |  |
| 149.700 | 33 | 01-May-06 | 116.2 | A |  |  |  |  |  |
| 149.700 | 33 | 25-May-06 | 140 | A |  |  |  |  |  |



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| 149.700 | 33 | 16-Jul-07 | 106 | A |
| :--- | :--- | :---: | :---: | :---: |
| 149.700 | 33 | 24-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 24-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 25-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 25-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 26-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 26-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 27-Aug-07 | 89.7 | GS |
| 149.700 | 33 | 27-Aug-07 | 89.7 | GS |

- Assessed as "ripe" May $11^{\text {th }}, 2006$ at km 116. Was taken as brood stock for 2006 hatchery program (male 3).
- Migrated upstream following capture to Braeside location by end of May.
- Was not identified upstream of km 116 in 2007 (not part of spawning event).

| PITtag |  | Capture Date | River Km | Sex | FL (cm) TL (cm) | WT (kg) | Age | Birth Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7F7D7C6201 |  | 16/09/1995 | 116.2 | 13 | 206232 | 72.64 | 83 | 1912 |
| Frequency | Code | Telem. Date | River Km | Station | River |  |  |  |
| 149.500 | 105 | 16-Sep-95 | 116.2 | S | NECHAKO RIVER |  |  |  |
| 149.500 | 105 | 09-Nov-95 | 116.2 | S |  |  |  |  |
| 149.500 | 105 | 09-Nov-95 | 116.2 | A |  |  |  |  |
| 149.500 | 105 | 12-Dec-95 | 116.1 | S |  |  |  |  |
| 149.500 | 105 | 21-Jan-96 | 116.2 | S |  |  |  |  |
| 149.500 | 105 | 22-Feb-96 | 116.2 | S |  |  |  |  |
| 149.500 | 105 | 22-Mar-96 | 116.2 | A |  |  |  |  |
| 149.500 | 105 | 20-Apr-96 | 116.2 | A |  |  |  |  |
| 149.500 | 105 | 27-Apr-96 | 91.5 | A | STUART RIVER |  |  |  |
| 149.500 | 105 | 03-May-96 | 20.4 | A |  |  |  |  |
| 149.500 | 105 | 15-May-96 | 48.1 | A |  |  |  |  |
| 149.500 | 105 | 28-May-96 | 48.1 | A |  |  |  |  |
| 149.500 | 105 | 17-Jun-96 | 48.1 | A |  |  |  |  |
| 149.500 | 105 | 26-Jun-96 | 48.1 | B |  |  |  |  |
| 149.500 | 105 | 21-Jul-96 | 47.9 | B |  |  |  |  |
| 149.500 | 105 | 29-Jul-96 | 47.8 | A |  |  |  |  |
| 149.500 | 105 | 09-Aug-96 | 48.1 | A |  |  |  |  |
| 149.500 | 105 | 25-Sep-96 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 28-Oct-96 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 29-Nov-96 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 15-Mar-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 18-Apr-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 03-May-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 23-May-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 04-Jun-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 07-Jun-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 12-Jun-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 19-Jun-97 | 48.7 | A |  |  |  |  |
| 149.500 | 105 | 24-Jun-97 | 48.7 | A |  |  |  |  |


| 149.500 | 105 | 02-Jul-97 | 48.7 | A |
| :--- | :---: | :---: | :---: | :---: |
| 149.500 | 105 | 14-Jul-97 | 48.7 | A |
| 149.500 | 105 | 13-Aug-97 | 48.7 | A |
| 149.500 | 105 | 11-Sep-97 | 48.7 | A |
| 149.500 | 105 | 17-Nov-97 | 48.7 | A |
| 149.500 | 105 | 15-Jun-98 | 48.7 | A |
| 149.500 | 105 | 29-Aug-98 | 48.7 | A |
| 149.500 | 105 | 10-Sep-98 | 48.7 | A |
| 149.500 | 105 | 22-Apr-99 | 48.7 | A |
| 149.500 | 105 | 11-May-99 | 48.7 | A |

- Fish captured at km 116 in Sept 1995 and assessed as code 13 fe male. Telemetry shows is overwintered at that location and then migrated into the Stuart River on April $27^{\text {th }}$, 1996. Tag was likely shed at km 48.7 around August $9^{\text {th }}$.


- Fish captured at km 111 (Sept 1998) and km 116 (Sept 2001) and was assessed as code 12 and 97, respectively.
- Telemetry suggests fish overwintered at km 116.


- Between Sept 1995 and July 1999, fish did not migrate upstream of km 124 and was likely not mature enough to spawn during any events that may have taken place during that period.
- By 2006, fish had sexually matured and was identified within the 2006 spawning congregation at VH and had returned to the km 116 hole by midAugust.
- In 2007, fish did not migrate upstream of km 124 and was therefore did not spawn at VH during recorded event.


| 149.680 | 106 | 23-Jun-98 | 116.2 | B |
| :--- | :---: | :---: | :---: | :---: |
| 149.680 | 106 | 29-Aug-98 | 115.2 | A |
| 149.680 | 106 | 01-Sep-98 | 116.2 | B |
| 149.680 | 106 | 04-Sep-98 | 116.2 | B |
| 149.680 | 106 | 07-Dec-98 | 116.2 | S |
| 149.680 | 106 | 13-Jan-99 | 116.2 | S |
| 149.680 | 106 | 03-Jul-99 | 116.2 | B |
| 149.680 | 106 | 13-Jul-99 | 116.2 | B |

- Fish originally captured at km 115 in Sept 1995 and was assessed as a code 2 male. Telemetry shows it likely overwintered at that location.
- On May $3^{\text {rd }} 1996$ it migrated to km 107 and remained in that general area until August $9^{\text {th }}$ when it returned to $\mathrm{km} \mathrm{116}$. could be associated with spawning but most likely is associated with rearing and feeding due to maturity of the fish.
- Tag was likely shed at km 116 as it remained at that location.

- Fish originally captured at km 76.4 in June of 1996 and assessed as a code 3 male. Telemetry shows it migrated to km 116 by Sept for rearing/overwintering habitat.
- Tag likely shed at that km 116.

- Tag was potentially shed as it was located at km 116 for a 2 year period. One database record (June 14, 1998) has it located at km 16.2 , however, this is thought to be a data entry error that should be km 116.2.
- Fish was captured in August 2004 in Stuart Lake.
- Fish has never been identified at a known spawning area.

- Tag potentially shed as fish was only located at km 116 .
- Assessed at maturity code 3 in 1996 and 2001.
- Fish never identified at known spawning areas.

- Fish has not been identified at the known spawning area in VH.
- Following tagging in Sept 98 , fish remained at km 125 overwintering hole but migrated downstream to vicinity of Stuart River confluence where it remained from April to July 1999. This area likely provides suitable feeding/rearing habitat
- In 2002 it was re-captured in the same general area ( km 93.2 based on UTM coordinates). This area likely provides suitable rearing habitat.

- Fish originally captured at km 116 in Sept 1996 and assessed as a code 12 female. Telemetry shows it overwintered at km 116 in 1996/1997 and migrated to km 87 by May $23^{\text {rd }}$ 1997. Migration could have been due to spawning (based on time of year) but more likely was for rearing and feeding as that location is not known to provide spawning habitat.
- Tag likely shed at km 87 .


| 149.560 | 111 | 14-Apr-98 | 116.2 | S |
| :--- | :---: | :---: | :---: | :---: |
| 149.560 | 111 | 14-Jun-98 | 116.2 | S |
| 149.560 | 111 | 23-Jun-98 | 116.2 | B |
| 149.560 | 111 | 29-Aug-98 | 116.5 | A |
| 149.560 | 111 | 01-Sep-98 | 116.2 | B |
| 149.560 | 111 | 09-Nov-98 | 116.2 | A |
| 149.560 | 111 | 07-Dec-98 | 116.2 | S |
| 149.560 | 111 | 03-Jul-99 | 116.2 | B |
| 149.560 | 111 | 13-Jul-99 | 116.2 | B |

- Tag likely shed as fish was only ever identified at km 116.
- Fish re-captured in Sept 2005 at km 117 suggesting it likely overwinters at that location.

- Fish was assessed as being ripe (code 5) on June 18,1996 at km 126.5 and was recorded at the same approximate location (km 127) on June $19^{\text {th }}$.
- No additional telemetry data is available until July $29^{\text {th }}$ when the fish was identified at km 110 .
- The data from this fish suggests that spawning may have occurred at the VH site in 1996. The event may have occurred prior to June $18^{\text {th }}$ or between June $19^{\text {th }}$ and July $29^{\text {th }}$, however no data exists for either period. The later possibility seems unlikely based on the timing of known spawing events being earlier in the year, however, in an unusually cold year spawning could be delayed. A review of temperature data from the Burrard Bridge may help narrow down the potential spawning period.
- In 1996, the fish appears to have overwintered at km 132, as it was located there on Nov $29^{\text {th }}, 1996$ and Mar $15^{\text {th }}, 1997$. However, it is also possible that it migrated downstream to km 124 following the Nov $29^{\text {th }}$ record and returned before Mar $15^{\text {th }}$. This is similar to what was observed in 1997 when the fish migrated from km 133 to km 124 between Nov $17^{\text {th }}$ and Dec $10^{\mathrm{th}}$, however the fish did not return to km 133 .
- In 2007 the fish was captured at km 124 and assessed as code 2 suggesting it will not be mature enough to spawn in 2008.


## Appendix 4. Maps

1. Capture and telemetry - March and April
2. Capture and telemetry - May and June
3. Capture and telemetry - July to October
4. Capture and telemetry - November to February
5. Sample Locations - Nechako/Stuart
6. Sample Location - Fraser







[^0]:    ${ }^{1}$ PIT tags: 4124680C7A, 4528347F32, 501F7A3051, 7F7B033622, 7F7B036C09, 7F7B0B2E51, 7F7B0C4A60, 7F7B0C6864

[^1]:    ${ }^{2}$ PIT tags: 4124741829, 412515071A, 422E754551, 424E574A40, 4526754B01, 4528394A39, 45285A7033, 48594B4052, 7F7B0C6856

[^2]:    NECHAKO RIVER

