EXECUTIVE SUMMARY

Triton Environmental Consultants Ltd. was retained by Pacific Inland Resources (PIR) in partnership with the Ministry of Environment, Lands and Parks (MELP) in Smithers to conduct reconnaissance level fish and fish habitat inventories in the Bulkley Forest District. This report summarizes the historical fisheries data collected by SKR Consultants Ltd and the field data collected by Triton survey res in working unit 2. The historical fisheries data indicates the presence of the following species in this working unit :

- steel head and rainbow trout (*Oncorhynchus mykiss*),
- sockeye (*O. nerka*),
- chinook (*O. tshawytcha*),
- pink (*O. gorbusha*),
- coho (*O. kisutch*),
- cutthroat trout (*O. clarkii*),
- Dolly Varden (*Salvelinus malma*) or,
- bull trout (*S. confluentes*),
- mountain whitefish (*Prosopium williamsonii*).

A total of 56 sites were sampled between July 25 and October 2 1996 and July 7 and September 20 1997. Five sites were classified as "Not A Creek" due to the lack of a defined channel. Fish were captured by electrofishing at 9 sites and by minnow trapping at 3 sites. Fish were visually observed at 1 site. The species sampled were : cutthroat trout, rainbow trout, Dolly Varden and sockeye salmon. A total of 15 sites were classified as S5 or S6, the basis for the non fish bearing status is summarized. The report also includes recommendations for resampling.

Triton Environmental Consultants Ltd.'s project team for this inventory project included:

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Triton Environmental Consultants Ltd. would like to thank Mr. Alan Baxter of. Pacific Inland Resources for his assistance throughout the planning and field phases of this project. The principal contract monitor was Mr. Paul Giroux, B.C. Ministry of Environment, Lands and Parks, Smithers office. The quality assurance was conducted by Mr. Ward Prystay and Mr. Ryan Sherman. Triton Environmental Consultants Ltd. would also like to thank Mr. Dave Reynard and Mr. Steve Grey of Highland Helicopters.

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1.0 INTRODUCTION

1.1 Background

Pacific Inland Resources retained Triton Environmental Ltd. (Triton) to conduct a reconnaissance level fish and fish habitat inventory in 14 different watersheds in the Bulkley Forest District. Existing information on fish distribution within the watersheds under investigation was collected by SKR Consultants LTD, in Smithers, B.C. Data from the provincial and federal government sources such as the Stream Information Summary System (SISS) and the evolving Fisheries Information Summary System (FISS) were researched for information. This report summarizes historical and field data collected in unit 2, which covers the section of the Babine River and its tributaries which occur below Nilkitkwa Lake, downstream to the Bulkely Forest district boundary. The bulk of existing fisheries information pertains to the Babine River. Information is available for only one tributary (480- 3352) in this unit. The historical records indicate that the following species are found in the the study area :

- steel head and rainbow trout (*Oncorhynchus mykiss*),
- sockeye (*O. nerka*),
- chinook (*O. tshawytcha*),
- pink (*O. gorbusha*),
- coho (*O. kisutch*),
- cutthroat trout (*O. clarkii*),
- Dolly Varden (*Salvelinus malma*) or,
- bull trout (*S. confluentes*),
- mountain whitefish (*Prosopium williamsonii*).

Stream classification is required under the Forest Practices Code (FPC) of British Columbia Act (Bill 40 - 1994) and the associated Operational Planning Regulation enacted in June 1995. It is used to determine the appropriate width of riparian management areas.

1.2 Objectives

Triton's objectives were to describe fish distributions and habitat characteristics, and to provide stream classifications according to the Forest Practices Code. Fish and fish habitat operational inventories consist of:

- reconnaissance-level surveys aimed at characterizing fish habitat and distribution,

- identification of fish and fish habitat values that require special designation under the Forest Practices Code (e.g. sensitive areas); and
- new, reinterpreted, or augmented data to meet Forest Practices Code requirements for classification of areas (e.g. fish stream classification).

2.0 STUDY AREA

2.1 Location

The Bulkley Forest district is located in north-central British Columbia and contains several major tributaries to the Babine and Bulkley Rivers. The 1:20,000 TRIM maps that cover this woking unit are: 93 M 047, 93 M 057, 93 M 067,93 M 056, 93 M 066. The Babine working unit cover approximately 285sq. km and comprises 3.6% of the study area. It includes that part of the Babine drainage (Fisheries Class I Waters) located in the Bulkley forest district. This working area extends from the confleunce with the Nilkitkwa River in the south to the forest district boundary in the west. The eastern boundary occurs along the height of land separating the Babine drainage from a main tributary, the Nilkitkwa drainage. The southwest side divides the Babine drainage from the Nichyeskwa drainage (working unit 3). The streams sampled in unit 2 are all tributaries to the Babine River.

fig.1

2.3 Access

Most of the Babine working unit is accessible by helicopter or boat, with road access for only 8 of the significant tributaries, located on the eastern side of the river. The streams on the west side of the river, as well as the remaining streams on the east side of the river, require boat access for the lower reaches and helicopter access for the uppper reaches. The streams sampled in this unit were sampled primarily by helicopter crews, with some road access.

2.4 Resource Use

Logging is the primary reosurce activity in this working unit, however, recreational facilities are located at Smithers Landing.

3.0 METHODS

3.1 Physical

Prior to the start of the field program 1:20,000 TRIM maps were used to estimate the location of reach breaks, as needed to identify potential sampling sites. The locations of these reach breaks were subsequently confirmed or modified during the field studies.

The survey was conducted by a ten person field crew working as 5 teams in 1996 and an eight person field crew working as 4 teams in 1997. Sites at the top of the watershed were sampled first to determine fish presence whenever possible. DFO/MELP Stream Inventory Survey forms were filled out for each site (Department of Fisheries and Oceans and Ministry of Environment, 1989). Channel widths were measured with hip chains, measuring tapes, meter sticks or were visually estimated where wading conditions were dangerous. Water depths were measured with a meter stick. Stream classifications, whether fish bearing or non fish bearing, require the measurement of a minimum of six channel widths. Stream gradients were measured using a Suunto clinometer. In order to allow for future verification of sampling sites, all sampling sites were permanently marked with unique flagging tape (blue and white striped) and the GPS locations of all sites were noted.

Photos were taken at each site to document field data and conditions. Canon Sure Shot A1 Prima AS-1 cameras were used for this purpose. The camera is equipped with a 32 mm lens. Photos were typically taken of both the upstream and downstream view of the stream and any characteristic features such as cascades and falls. Photos were often taken of fish captured at the site. The film used was 200 ISO. The photodocumentation summary appears in Appendix 3.

3.2 Biological

Trtion oBtained fish sampling permits from the appropriate DFO and MELP offices. Fish presence or absence was established by electrofishing, minnow trapping and occaisionally angling. A minimum area of approximately 100 m sq was electrofished, however, a larger area was often fished above barriers. The effort (shocking time and distance shocked) was recorded for each sample site. A variety of electroshocker models were used in this study including :

- Smithroot 12 B POW,
- Smithroot Type VII,
- Smithroot 15 A,
- Coffelt Mark 10.

The electroshockers were commonly set at 60HZ at 6MS, however adjustments were made where appropriate. Salt was not used at any of the sample sites. The fork length of each fish collected was measured and, when necessary, voucher specimens were collected and stored in a 10% formaldehyde solution in plastic bags. These specimens were delivered to the Smithers office of BC Environment.

The data collected from existing sources and during the field program were used to determine the riparian class as defined under the *Forest Practices Code*. **Table 1** provides the FPC definition of each riparian class. Draft procedures are also outlined in the guidebook to determine the riparian management areas (RMA) for lakes (L1 - L4), wetlands (W1 - W5) and fisheries sensitive zones.

4.0 Physical Characteristics

4.1 Stream Flow

The hydrological records were reviewed from Water Survey of Canada (WSC) records. An estimate of daily flows (m^3/s) was based on Water Survey of Canada Daily maxima, minima, and maximum instantaneous flows were also summarized from existing records if available. Mean annual discharge (m^3/s) was calculated from existing hydrological records.

4.2 Water Quality

As agreed with the Ministry Representative, water samples were not collected for chemical analyses. The parameters that were measured for each site, however were temeperature, pH and conductivity. Conductivity was measured with a handheld LaMotte TDSTestr 3™ conductivity meter with a range of 0

to 1990 μS. The pH at each site was measured with a handheld LaMotte pHTestr 2™ pH meter. Turbidity was determined subjectively and it was stipulated by the ministry representative during the 1996 quality assurance phase of the project that the depth of the deepest pool would be the default value in the database when the water was clear to the bottom. During the 1997 season turbidity was measured only in cases where the water could not be described as clear to bottom.

The flow stages ranged from dry to flood in the sampling period. Water temperatures during this study ranged between 6.0 and 21°C, with an average of 13.5. **Table 2** summarizes the temperature, pH and conductivity measurements collected during the course of this inventory project. The pH ranged from 6.02 to 7.50, with an average value of 6.76. The conductivity ranged from 20 to 130 with an average value of 75. The turbidity values are not discussed here as the values were defaulted on request of the QA/QC monitor to the depth of the deepest pool when turbidity was recorded as clear to the bottom. This value is not considered indicative of the stream turbidity by Triton and will not be discussed further.

5.0 RESULTS AND DISCUSSION

The survey took place between July 28th and August 7th 1996 and July7 and September 20 1997. A total of 57 sites were sampled and 5 sites were classified as "Not a creek" due the absence of a defined channelk in the sampling areas. Fish were caught or observed at 13 sites. Fourteen sites were classified as non fish bearing, due to the presence of impassable barriers and or a lack of suitable habitat in the sampling areas. A summary of significant barriers identified in this working unit is provided in Table 3. The summary information for all of the sample sites is listed in Table 4 and includes proposed stream classification, fish presence or absence data, and fish sampling methods. This table is arranged by sub basin, in alphabetical order. A list of sample sites classified as non fish beairng is provided in table 5 and Table 6 lists sites that have been classified as fish bearing and for which future sampling is recommended. Individual fish data for this working unit has been summarized in Appendix 2.

5.1 Babine River (480-0000-000) (93 M 066, 93 M 057, 93 M 056, 93 M 047)

5.1.1 Sensitive Habitats and Barriers

Approximately 28.8km of the Babine River flows through this working unit. The Babine River has low gradient and multiple rapids in this area. In addition, the side slopes have moderate to low gradient. A 2 km section of the Babine on TRIM sheet 93 M 056 is somewhat confined. Approximately 48 tributaries flow into the Babine River in this unit. The area in the vicinity of and to the south of the confluence with the Nilkitkwa River, is easily accessed by road. The tributaries to the Babine were sampled at 57 locations including "NC"'s.

5.1.2 Fish Summary Table and Stream Classification

The historical information indicates the presence of a wide variety of fish species in this unit. Fish sampling was conducted by electrofishing at the majority of the sites and minnow trapping at select sites. Fish were caught at 13 sites and the species captured or visually observed include, Dolly Varden, rainbow trout,cutthroat trout and sockeye salmon. The Babine River mainstem was not sampled in this study but would be classifed as an S1, based on fish presence and an average channel width in excess of 20 m.

The tributaries in this working unit range in size from S2 to S4 and S6. The majority of the tributaries sampled in 1996 were classified as S3, based on channel widths equal to or exceeding 1.5 m. Some S5 and S6 streams were also identified in this unit, based on the presence of barriers and a lack of evidence of a resident population above these barriers (see Table 3). For example sites JULIE 55 through 58 have been classified as non fish bearing as no fish were caught at these sites, located above an impassable 5 m falls.

5.2 Unnamed Tributary to the Babine River (480-2494-000) (93 M 056, 93 M 066)

5.2.1 Sensitive Habitats and Barriers

This large unnamed tributary to the Babine is 13.8 km in length and is fed by 20 smaller streams. A number of wetlands occur in the upper raches of this stream, however no sensitive habitats were identified by the field crew working in this area. Beaver dams were the only observed barriers in this system however, the confinemnt and variable gradient of this stream indicate potential cascade barriers in several areas. Reach 1 is moderately confined and has moderate gradient, both of which increase in reach 2. Reach 3 has low gradient and is largely unconfined. A small lake was noted at the top end of this system.

5.2.2 Fish Summary Tables and Stream Classification

The mainstem was classified as an S2 in reach 2 based on an average channel width of 5.0m and the presence of fish habitat in the sampling area. The tributary to the main creek was classified as an S3 based on an average channel widht of 2.64m and the presence of suitable fish habitat. (see Table 4). No historical information was found for this stream and no fish were visually observed in either of the sample sites. A number of unsampled tributaries to the larger creek have been classified as non fish bearing due to steep gradient associated with the steep side slopes of the mainstem.

5.3 Unnamed Tributary to the Babine River (480-2809-000) (93 M 056)

5.3.1 Sensitive Habitats and Barriers

This tributary is 9.3 km in length and is fed by 14 smaller streams. The TRIM sheet indicates steep gradient and some canyon like confinement in reach 1, however no barriers were identified by the sampling crew working on this system. The confinemnet is variable through reach 5. Reach 6 has very steep gradient and has been classified as non fish bearing. This stream was sampled at 4 locations, including reaches 4 and 5 of the mainstem.

5.3.2 Fish Summary Tables and Stream Classification

No historical fisheries records were found for this stream and no fish were caught by electrofishing in the 4 sample sites on this system. However, the mainstem was sampled in reaches 4 and 5 and was classified

as fish bearing based on average channel widths of 1.56 meters, 2.22 meters and the presence of fish habitat in the sampling area. One of the larger tributaries to the main creek was calssified as an S3 based on the presence of fish habitat and an average channel width of 2.96m (see Table 4).

5.4 Unnamed Tributary to the Babine River (480-2641-000) (93 M 066)

5.4.1 Sensitive Habitats and Barriers

This tributary is 6.4km in length and is fed by 5 small tributaries. No sensitive habitats or barriers were identified by the field crew working on this stream, however moderately steep gradient and confinement occur at the mouth. Reach 1 has relatively steep gradient and varieed, typically moderate confinement. Reach 2 has moderate gradoeint and is unconfined. This stream was sampled one, in reach 3.

5.4.2 Fish Summary Tables and Stream Classification

No historical records exist for this stream and no fish were caught by electrofishing at sample site R33. This stream has been classified as an S3 based on an average channel width of 2.0m and the presence of fish habitat in the sampling area.

5.5 Unnamed Tributary to Babine River (480-3222-000) (93 M 057)

5.5.1 Sensitive Habitats and Barriers

This unnamed tributary is 7.8 km in length and is fed by 6 smaller tributaries. It has somewhat steep gradient at the mouth but no barriers to fish migration were observed by field crews. Reach one typically has low to modeate gradient and is occaisionally confined. The gradiend gradually deacreases in reach 2 and is consistently low thorough reach 5, which is a lake. A number of wetlands were noted in direct contact with the main creek., however no other sensitive areas were observed. This system was sampled at 2 locations, including reach 4 of the mainstem.

5.5.2 Fish Summary Tables and Sensitive Habitats

No historical information was noted for this stream, however rainbow trout and cutthroat trout were caught by electrofishing at T31, in reach 4, roughly 1.4 km downstream from the lakein reach 5. Fish were not caught at the sample site Y46, located in a tributary to reach 1. The main creek was classified as an S3 based on the presnec of the trout and the average channel width of 1.64m. The tributary was

classifeid as an S4 based onan average channel width of 1.43 m and the presence of fish habitat in the sampling area.
The remaining tributaries to this stream are small S4 sized streams that have no gradient and/or confinement problems.

5.6 Unnamed Tributary to Babine River (480-3245-000) (93 M 057)

5.6.1 Sensitive Habitats and Barriers.

This unnamed tributary is 7km in length and has 13 smaller tributaries. No barriers to fish migration were noted at any of the sample sites. No sensitive habitats were noted, however a lake (440 m by 200m) in the upper reaches of a larger tributary to the main creek is surrounded by wetland. Reach 1 has fairly steep gradient and is somewhat confined. Reach 2 is quite confined but has less steep gradient. Reach 3 has low gradient and is unconfined. This system was sampled at 3 locations, including reach 3 of the mainstem.

5.6.2 Fish Summary Tables and Stream Classification

No historical records were found for this stream, however Dolly Varden were caught by electrofishing and minnow trapping at two sites, T32 and R38. The mainstem was classifeid as an S3 in reach 34 based on an average channel width of 1.94 m and the presence of Dolly Varden in the sampling area and the larger tributary was classified as an S3 based and average channel width of 1.8m and the presence of Dolly Varden in the sampling area. One small tributary was classifeid as "NC" based on the lack of a defined channel and another was classifeid as S4 based on an average channel widht of .71m and a lack of barriers to fish migration (see Table 4). The remaining tributaries are typically intermittent S4 sized streams.

5.7 Unnamed Tributary to the Babine River (480-3352-000) (93 M 047, 93 M 056, 93 M 057)

5.7.1 Sensitive Habitats and Barriers

This tributary is 11.3 km long and is fed by 25 tributaries. Reach 1 is quite confined and has moderately steep gradient. Reach 2 flows througn a low gradinet area with a large wetland. Reach 3 is a lake occuring in a confined valley. Reach 4 has low gradietn. The gradient and confinemtn gradually increase in reach 5 and in reach 6 the graident is moderatley steep and the channel is quite confined. In reach 7, the gradient and confinement decrease and multiple beaver dams were observed. An extensive network of

wetlands occurs in this area. The headwaters of this sytem are chracterized by steep gradinet. This system was sampled at 5 locations, including reaches 2,4,5 and 7 of the mainstem.

5.7.2 Fish Summary Tables and Stream Classification

The historical records indicate the presence of steelhead in reach 2. Rainbow trout, cutthroat trout and Dolly Varden were caught by electrofishing and minnow trapping in reaches 2,4 and 5. The mainstem was classified as an S3 in reaches 2,4 and 5 based on the presence of fish and average channel widths of 3.0m, 3.87m and 2.85 m respectively. It was also classified as an S3 in reach 7 based on the presence of Dolly Varden in the sampling area and an average channel width of 3.31m.

5.8 Fish Age, Growth and Other Observations

5.9 Rare and Endangered Species Summary

No rare or endangered species were noted by crews working in this area.

5.10 Wildlife Observations

Moose, bear and beaver sign, as well some loons were noted in this working unit. Table 7 summarizes wildlife and/or wildlife signs observed by survey crews in this working unit. Beaver dams and ponds were the most commonly seen wildlife signs in this working unit.

5.5 Recommendations for Follow Up Sampling

A number of the sites in this working unit were classified as fish bearing despite the fact that no fish were caught in the sampling areas. Typically, these sites had suitable fish habitat and/or no observed barriers to fish migration. Future sampling is strongly recommended for the large tributaries sampled at JULIE 46, JULIE 37, JULIE 38, JULIE 35. These sample sites are located on sizeable tributaries with potential gradient and confinment problems near the mouths. A list of all sites in working unit 2 for which future sampling is recommended is provided in Table 6.

INSERT CARDS/PHOTOS

6.0 CONCLUSION AND RECOMMENDATIONS

The limitations to fish distribution in this working unit are associated with steep side slopes of the Babine River. Some of the tributaries sampled in this unit have steep gradient and are sometimes quite confined near the mouth, making fish use unlikley or impossible. Compunding this problem is a lack of medium to large sized lakes in some of these systems that could support resident populations.

Since many of the higher reaches of the tributaries have reasonable gradient, it is recommended that a select number of unsampled tributaries remaining in this unit be surveyed from the mouth to identify barriers and suitable habitat outside of the mainstem.

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