The 2008
Xeni Gwet'in Caretaker Area
Fisheries Enhancement Projects

Report Prepared For:
Xeni Gwet'in First Nations Government
General Delivery
Nemiah Valley, BC
V0L 1X0

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LEGAL COVENANT FROM THE XENI GWET'IN GOVERNMENT

The Tsilhqot'in and Xeni Gwet'in assert aboriginal title and rights in the Brittany Triangle and Xeni Gwet'in trap line. These areas are within the Tsilhqot'in traditional territory of Xeni Gwet'in First Nation and are delineated in William v. B.C. et al B.C.S.C. – Victoria Registry, Action No. 9-0913. Nothing in this report shall abrogate or derogate from any aboriginal title or aboriginal rights of the Tsilhqot'in, the Xeni Gwet'in First Nation or any Tsilhqot'in or Xeni Gwet'in members.

Acknowledgments

Cariboo Envirotech Ltd. would like to thank all of the Xeni Gwet'in people for their generous hospitality and for making us feel welcome in their traditional territory. Additional thanks to the elders of the Community, and to Chief Marilyn Baptiste and Councillors Lois Williams and Benny William for their guidance and advice. We would also like to thank the entire Band office staff for their assistance whenever it was needed.

We are extremely grateful to all community members for their many contributions on numerous consultative occasions for the provision of their traditional and historic knowledge of the fishery resource in their Caretaker Area.

We are forever indebted to our field crew of Rocky Quilt, and Norman William who made our work much easier. We would have been lost in their traditional territory without them.

Nancy Oppermann deserves a special thank you for her determination in acquiring the necessary funding for the project, and a thank you goes out to the Chilko Resorts and Community Association for the offer of accommodation at the north end of Chilko Lake.

We would like to thank our funding source, the Fraser Basin Council and the Pacific Salmon Foundation's Fraser Salmon and Watershed's Program.

We are once again indebted to Dinah and Jim Lulua for their generous hospitality in providing us with a cabin for accommodation, the use of their home whenever it was needed, lovely dinners and their great company.

We would like to thank TNG cartographer Mary Thurow for her mapping contributions.

Our thanks and apologies go out to those who may have helped us but have been forgotten in these acknowledgements.

Richard Holmes
Guy "Paddy" Smith

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1.0 Introduction

Nancy Oppermann, under contract to the Xeni Gwet'in, successfully applied for and received funding for this project from the Fraser Salmon and Watersheds Program (FSWP). The FSWP is jointly managed by the Fraser Basin Council and the Pacific Salmon Foundation and has been designed to build a better future for the fish and fisheries in the Fraser Basin through inclusive and collaborative partnerships. This philosophy is also close to the core of the Xeni Gwet'in First Nations culture and management intent for their fisheries resource.

A Xeni Gwet'in fisheries crew was recently established in the Nemiah Valley in 2006 and since then, has worked on building skills and knowledge appropriate to increasing it's management and protection of this major resource within their territory. The crew is mindful of the positive influence their pristine watersheds have on the Fraser River drainage as a whole. The 2008 project represents a substantial step forward for the crew by implementing interventions that were identified over the previous two seasons of extensive assessment and documentation (Holmes 2006, 2007).

While budget limitations dictated that only two of the previous four team members could be rehired in 2008 and the season was effectively shortened to the months of August and September, the crew was still able to achieve a substantial number of recommendations detailed in the 2008 (Holmes) report.

The 2008 field season allowed the crew through the guidance of Cariboo Envirotech Ltd. an opportunity to further develop their knowledge and skills in managing the fisheries resources in Xeni Gwet'in territory.

2.0 Project Location

The survey area is located in the Chilcotin Forest District west of Williams Lake and south of the Chilcotin Highway 20, between Alexis Creek and Tatla Lake.

Two major watersheds were involved in the projects. Firstly, the Chilko River drainage with it's associated sub-basins of Nemaia (sites 9 and 10), Abelach'ez Lake and it's connective creeks (site 6) and Choelquoit Lake and associated streams (though this drainage now has only subterranean connection to the Chilko River) (sites 1, 2, 3 and 4). Secondly, the Taseko River where one project was directly connected to the mainstream (site 5), and another involved the Onion Lake sub-basins (site 7).

The project areas all fall within the Caretaker Area and traditional fishing, hunting and trapping sites of the Xeni Gwet'in First Nation. The areas are all located within the Brittany Triangle and Trapline Areas that have been subject to the land claim case in the Supreme Court of British Columbia, Tsillhqot'in Nation vs British Columbia 2007 B.C.S.C. 1700. It is the intention of the Xeni Gwet'in First Nation to manage the lands under their control responsibly and sustainably.

Access to the area is either by the Chilko Lake Forest Service Road, south from Tatla Lake or by following the Nemiah Valley Road (Ministry of Transport), south from Lee's Corner near Alexis Creek. The two roads are connected seasonally by a secondary road from Henry's Crossing (the Chilko River Bridge) just north of Chilko Lake, via Tsuniah Lake Lodge (private land with access by agreement) and through to the Nemiah Valley at Lhizbay.

3.0 Methodology

The crew had a two-month field season to complete the five major projects that were widely located throughout the Xeni Gwet'in territory. All sites had competing demands, often with definitive time lines and always a weather variable.

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Site 5, at the Taseko River backwater, was set up first and required constant monitoring of the minnow traps and the dam. Site 1, above Choelquoit Lake was geographically distant from the Nemiah Valley base and required several extended camping forays with associated equipment and provisioning. The monitoring of fish runs in both Nemaia and Robertson Creeks (sites 9 and 10) required a constant presence from mid-August until the end of September. The project demands at Abelach'ez (site 6) and

Digital photographs of appropriate habitat and sequential project progress are included in this report. All sites referred to in that text are marked on the enclosed map and listed in Appendix 1.

In their travels throughout the Caretaker Area, the crew constantly availed themselves to the opportunity for discussing the projects at hand, more efficient practices and concerns. Additionally, project planning was often discussed, and it is from these discussions that much of the suggested recommendations and conclusions were generated for this report.

4.0 Project Sites and Restoration

4.1 Choelquoit Lake (Water body I,D.00530) (Sites 1,2,3 and 4) (Map appendix 2)

In 2007, the discovery of a diverted headwater stream (Holmes 2008) in the Choelquoit Lake system led to a proposal to return the stream to its original and mapped course at site 1. It was hoped that this would contribute a substantial source of fresh water to the lake. Many local observers had noted the lake to be constantly shrinking over a period of 20 years (the time of the original diversion?). While this loss of an important water source (the stream was draining to Lincoln Creek in the Tatlyoko system) may not be the sole contributor to the lowered lake level as several other drainages in Xeni Gwet'in territory were observed to have less flow than historically, it was undoubtedly a factor.

Also of prime importance in re-directing this stream, is that it may re-establish spawning opportunity for salmonids within the system. Extensive observation and sampling in 2007 (Holmes 2008) failed to locate any evidence that either the rainbow trout or kokanee populations known to exist into the 1980's, still inhabit the Choelquoit Lake system, which is effectively isolated from the Chilko River.

The drainage consists of two lakes, Choelquoit (approx. 1400 ha.) and an unnamed upper lake (69.4 ha. waterbody I.D. 006008CHIR) at Tommy's Meadow. There are several feeder streams to the lakes that are mainly seasonal, the major one of which was the diverted stream (W.S.C.150-335700-46777-49932), draining the large catchment area of Potato Mountain. The two lakes are connected by a stream (W.S.C.150-335700-46777-49932) (site 2) which was historically, a stream utilized by the kokanee populations of both lakes for spawning. This was a traditional fall fishing site for the Xeni Gwet'in people, who also occasionally net fished both lakes. The stream may have been used in springtime as a spawning site for rainbow trout from the lakes however, it was observed to be completely dry in the fall.

In 2008, efforts continued to confirm the presence of residual kokanee or rainbow populations in the system. Netting, trapping and angling effort was again undertaken in the weeks of August 25th and September 29th. While fish were captured on all occasions, only the species northern pikeminnow, redside shiner and rocky mountain whitefish were confirmed.

In the week starting August 11th, the stream at site 1 was re-diverted to its original course and bed, which still exhibited a clear, if somewhat overgrown channel. A small proportion of the stream flow in spring flood had still obviously followed the original course.

Redirection was achieved by felling several trees across the diverted channel and then building a berm of gravels and debris from the adjacent area and original channel, up against them using hand tools (photos 1, 2, 3 and 4). As stream flow was at its lowest at this time of year, though still considerable, this was possible and effective.

Photo 1: Diverted stream flow proceeding west to Tatlyoko Valley

Photo 2: Start of the berm construction to divert stream to its original channel.

Photo 3: Large berm now constructed using felled trees and stream gravel.

Photo 4: Completed restoration with all of the water flowing north to the Cloelquoit system.

The redirection was inspected on August 25th and September 29th and was found to be effective and undisturbed. By September 29th, the flow was located downstream as far as the upper lake and though not large in volume, had obviously recharged much of the aquifer and swamp areas upstream where the flow was steady.

When spring flow 2009 arrives, a considerable water volume should reach the unnamed upper lake and start to re-connect this with Choelquoit for at least a considerable part of the year. To facilitate this, a very large logjam was removed from the outflow of the upper lake to the stream (site 3) (photos 5, 6, 7 and 8).

Photo 5: Logjam at the outfall of the unnamed upper lake (Tommys Meadow).

Photo 6: An upstream view of the crew dismantling the logjam.

Photo 7: Downstream view of the outfall after logjam removal.

Photo 8: Dry streambed below logjam.

During the summer of 2008 little was achieved in terms of adding surface water to the lakes, as water level monitoring stations set up at Choelquoit and the unnamed upper lake showed lake level declines of 11 cm and 7 cm, respectively from August 12th to September 28th. There was no indication that conditions for fish rearing in the lakes were unsuitable. The abundance of whitefish in both lakes points to adequate water temperature and oxygenation. Between August 12th and September 28th, temperatures recorded at mid-day, in the shallows (10 cm) of both lakes ranged between 17° and 20° C in Choelquoit and 15° and 17° C in the unnamed upper lake.

Critical to the existence or flourishing of rainbow trout and/or kokanee, will be the provision of adequate stream flow at spawning time. The interventions undertaken in the spring of 2008 offers the best potential for restoring such spawning habitat within the system. A small section of stream (approx. 200 metres) with gravel substrate exists where the diverted stream enters the upper lake (site 4) and the connector between the two lakes offers approximately 500 metres of low gradient gravel substrate (site 2).

At no point in the investigation, has any evidence of lakeshore spawning or suitable substrate been noted, nor has any of the local sources of knowledge of this system suggested that this has occurred.

4.1.1 Recommendations

It is important to continue the monitoring of the effects of the stream restoration undertaken in 2008. In the spring of 2009, it is recommended that site 1 be inspected to ensure no leakage or re-diversion has occurred. Sites 2 and 4 should be revisited to establish how substantive the flow is and whether conditions are suitable for rainbow trout spawning. Prolonged and night observation should be undertaken at this time to establish whether any rainbow trout spawners show up from the lakes to utilize either site. Traps should be set in both creeks to ascertain if fry are present as long as there is flow.

Similarly, in the fall of 2009, the sites should be observed to assess if flow has been maintained and whether spawning opportunity exists or if any kokanee are present. Given these observations and the information gathered in 2007 and 2008 seasons, there should be sufficient information to develop a management plan for the system.

Input will be required from Chief and Council at Xeni Gwet'in, whose traditional fishery existed here and advice sought from the Ministry of Environment in Williams Lake. Failure to discover any surviving native stocks will require the development of a restocking plan. This may involve either or both kokanee and rainbow trout. The use of locally sourced stock should be given strong consideration, particularly if it is felt that adequate spawning provision has been re-established and that the system can be developed other than as an entirely stocked fishery.

4.2 Taseko River Off Channel Habitat (Site 5) (Appendix 1&2)

In 2007 the fisheries crew in Nemaia noted an extensive pond area adjacent to the Taseko River, near Onion Lake (Holmes 2008) (site 5) (Appendix 1-Google Earth Fig.1). This pond, extending some four hectares in area, was isolated from the Taseko River by a historic and substantial beaver dam. Observation, angling and trapping in 2006 and 2007 (Holmes 2007) led to the belief that no or very few fish were present in the pond, although fish habitat appeared suitable. The known presence of spawning chinook in the mainstream of the Taseko River immediately adjacent to this site, the paucity of substantial off channel and backwater habitat within the Taseko River and the year round cold water conditions there, created interest in connecting the pond to the backwater with a view to developing a substantial chinook fry rearing opportunity.

In early August 2008 extensive angling and trapping was undertaken in the pond area and again produced no fish of any species. There was, however, an abundance of potential fish food noted with large quantities of fresh water shrimp, backswimmers, water beetles and dragonfly larvae present. Minnow trapping in the adjacent backwater of the Taseko River produced quantities of chinook fry (3 minnow traps set overnight, produced 12 chinook, 1 rainbow trout and 1 bull trout fry) (photo 9).

Photo 9: Chinook fry from the Taseko River backwater.

On August 6th, the dam separating the pond area from the Taseko backwater was breached, originally by creating a one foot wide channel (photos 10, 11, 12 and 13) and inflow established. The opening was kept small, as there was a concern as to whether the

opening of the dam may lead to draining of the pond area, which was of unknown depth. A water station was set up to monitor such level changes within the pond and water temperatures recorded at both the pond outfall and in the Taseko backwater. Five minnow traps were set up in the pond to monitor any immigration of fish into the pond and the site was visited regularly to empty these and record temperature and water level data.

Photo 10: Taseko off channel habitat upstream view of dam.

Photo 11: Taseko off channel habitat. Downstream view of historic beaver dam.

Photo 12: Breached dam to allow fish a

Photo 13: Breached dam view from downstream.

Water levels in the pond did vary throughout the summer (Table 1). Initially falling but then rising substantially in an exceptionally hot week when the Taseko River rose with additional snow melt (August 16th - 21st). The gravel substrate of the pond is presumably linked to the Taseko River water table, as there were no active input streams, or rain events. At all times, flow out through the breached dam was maintained and by August 21st it was decided to widen the channel to 18 inches as there were some problems with floating weeds from the pond building up at the outfall. Also on August 21st, time was allocated to canoe the whole of the pond in an attempt to assess the depth and the potential of the pond to offer over wintering as well as rearing opportunity. Forty soundings were taken and recorded with twenty along the north/south axis and twenty along the east/west. The average depth from these measurements came out at 1.56 meters with the maximum depth recorded at 3.2 meters. While the southern portion of the pond is generally shallow, the northern end undoubtedly offers sufficient depth for over wintering of fry. Measurement of winter oxygen levels would be required to substantiate this conclusion.

Water temperatures within the pond were recorded (Table 1) at the outfall where the water was at its shallowest and never reached excessive levels. The pond water, however, was always substantially higher than the adjacent backwater of the Taseko River and this again was higher than the mainstream of the Taseko. The opening of the dam therefore gave fry the opportunity to move into warmer and more productive water and return to the river at will. Fry were often observed in the connecting channel.

Table 1: Water Temperature and Depth Data from Taseko Off Channel Habitat Summer 2008

Date	Water Temp. at noon at Pond Outfall	Water Temp. at noon in Taseko Backchannel	Water Depth Adjacent to Pond Outfall
Aug.6	19°C	12°C	64cms
Aug.9	16°C	9°C	55cms
Aug.16	20°C	12°C	58cms
Aug.21	18°C	14°C	70cms
Sept.4	18°C	15°C	62cms
Sept.12	13°C	9°C	53cms
Sept.22	15°C	12°C	59cms
Sept.26	10°C	8°C	57cms
Oct.1	12°C	10°C	57cms

The fact that fish utilized the pond area throughout the summer was evidenced through the minnow traps and by observation. While trapping of fry within the pond never caught chinook in the numbers that were obtained in the initial backwater trapping, fish were continually caught throughout the summer. The smaller numbers of fish entering the traps were probably a function of the extensive nature of the pond (4 ha) and the abundance of food within. Chinook fry caught in the pond appeared in excellent condition and by October 1st (photo 14) had gained substantial weight and length when compared to photo 9. On occasion, in calm water conditions, substantial shoals of fish were noted surface feeding within the pond (photo15). These were assumed to be chinook fry. Rainbow and bull trout fry and juveniles (photo 16) also took advantage of the warmer water and feeding opportunities offered, and were also caught on occasion in minnow traps.

Photo 14 Chinook fry from off channel habitat at end of the field season (October 1st).

The final visit to the site in the 2008 season was on October 1st and at this point all traps and the water level station were removed. There was still flow at the outfall, though the water level was at its lowest and the dam was left open to allow fish resident in the pond the opportunity to return to their natal stream.

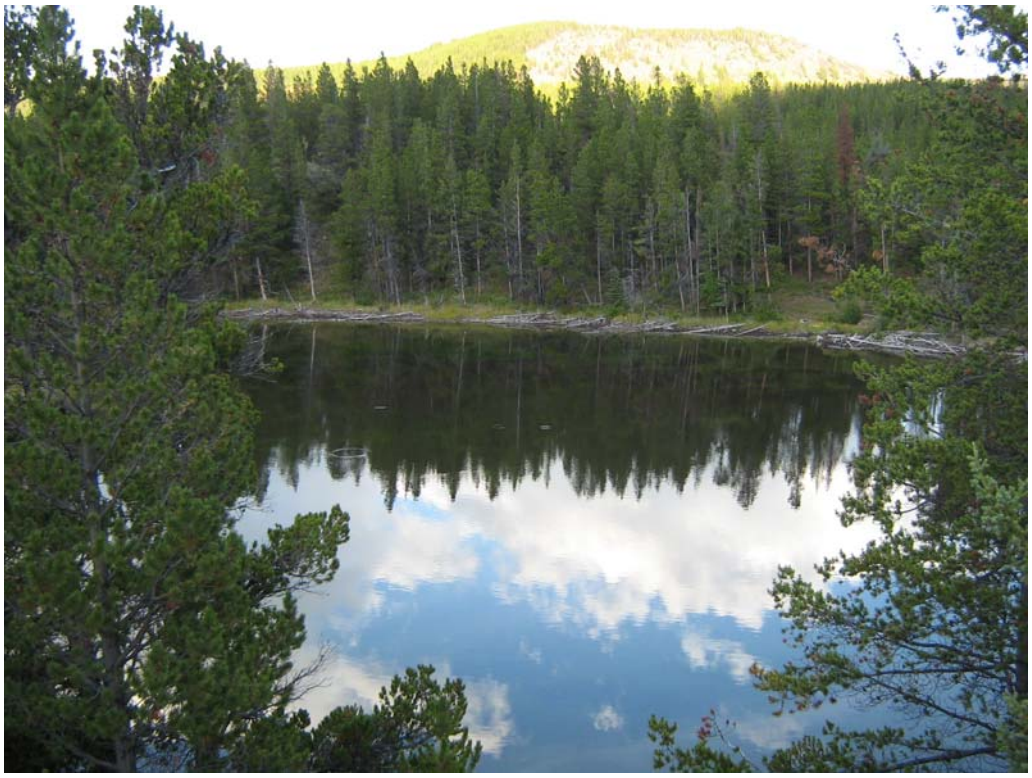

Photo 15: Fry rising in Taseko off channel habitat.

Photo 16: A bull trout juvenile captured in the Taseko off channel habitat.

4.2.1 Recommendations

The opening of access to the off channel pond at site 5 would appear, from the information gathered in the summer of 2008, to be a success in terms of offering an extensive area of warmer and sheltered off channel habitat to Taseko River chinook, rainbow trout and bull trout fry. It is hoped this could result in increasing numbers of these species, as rearing habitat appears in short supply in the system.

The project does however require some ongoing monitoring and maintenance to continue to be successful. The minimum requirement should be the inspection of the channel through the dam. It is critical that this should now remain open, particularly to allow chinook fry and smolts free access to the mainstream Taseko River. At no point during the project, was there sign of fresh beaver activity as the lodge (photo 17) responsible for the construction of the dam is now derelict. However, the likelihood must exist that the beaver will re-occupy the site. The monitoring of this dam should be adopted by the Xeni Gwet'in fisheries crew as part of their now annual program.

Photo 17: Derelict beaver lodge at Taseko off channel habitat.

Over and above this basic maintenance, opportunity may exist here for the collection of valuable data on salmon stocks in the Taseko drainage. Such information is sadly lacking with the silt filled river water prohibiting aerial counts of spawning adults.

The narrow entrance/exit to the pond area offers the potential for a fish trap to be positioned that could monitor the movement of fry and smolts in and out of the pond. Such counts could give valuable information as to the annual spawning success of chinook in the Taseko River and to the relative numbers of smolts migrating downstream. The need for frequently monitoring such a trap would be labour intensive, but when combined with other projects in the area would be achievable. An additional benefit of such regular monitoring would likely reveal the presence of any coho fry in the system, a fact that has not yet been established.

It has been suggested the Band approach D.F.O. to procure a suitable trap system to achieve this end and as soon as sufficient funding is available, set up a trial program. When the opportunity presents itself, the fisheries crew should monitor winter oxygen levels below the ice of the pond area and in 2009, sample chinook fry by trapping to assess winter growth of the fish that have remained in the pond.

4.3 Nemaia Creek and Robertson Creek (Sites 9 and 10) (Appendix 1)

In 2006 and 2007, considerable fish and fish habitat assessments were undertaken on Nemaia Creek (site 9) and Robertson Creek (site 10) to improve site habitat and the connectivity between habitats. The original 2006 Fish Habitat Study (Holmes 2006) hightlighted spawning habitat and access to it, as being critical in the Nemaia drainage. Migrating stocks of rainbow trout, bull trout and sockeye salmon were known to travel upstream from Chilko Lake to utilize such spawning opportunity. Historical local knowledge indicated that all of these runs had formerly been much more numerous and extensive. Adult sockeye migrated upstream as far as Konni Lake and spawning bull trout were known to utilize habitat on the upper reaches Klokon Creek.

The most likely cause of the limited runs in recent years, (sockeye were thought to have virtually abandoned the system by 2006), appeared to be the explosion of beaver population in Nemaia. Until the 1980s beaver had been extensively trapped in the valley for both food and fur, however poor fur prices and dietary changes have since removed such control of beaver numbers. The result has been a very substantial increase in beaver populations. This is turn, has had a dramatic effect on the fishery. While their frequent damming of the creek has undoubtedly produced some excellent rearing habitats for the rainbow trout juveniles, it has severely limited access for the adult runs of all species from Chilko Lake. Very substantial dams are in place that present a physical barrier to fish and the consequent back flooding has killed large numbers of riparian trees, particularly spruce which are now falling into the river and producing numerous logjams. Both the dams and the logjams have resulted in considerable slowing of the stream flow and siltation of many sections of previously usable spawning gravels.

In 2006 and 2007, a policy of intervention was undertaken that would at least allow migratory salmonids access to some of the mainstream spawning areas and particularly to the major tributary of Robertson Creek, a cold-water tributary noted in 2006 to be important bull trout habitat.

While no market or obvious use was available for the beaver, culling was not considered desirable and there was recognition of their contribution to rearing habitat. Therefore, a policy was implemented to open dams in the lower sections of Nemaia and Robertson Creeks sufficiently to allow fish passage. Timing of this was critical, as they are soon re-built, and was based on the arrival of sockeye at the Henry's Crossing site on Chilko River downstream. Observation indicated that bull trout usually accompanied the sockeye runs, likely fed on eggs and spawned slightly later. Additionally, when time and labour was available, logjams within the two creeks were broken up to improve flow rates and clean gravel.

In 2006 and 2007, this intervention was rewarded with runs of approximately 500 and 100 sockeye adults, respectively, and considerable numbers of large bull trout were observed spawning during both years in Robertson Creek.

The 2008 proposal therefore was to continue with the same policy. The development of the Traditional Village site at Nemaia further encouraged removal of logjams with the potential of making sections of Nemaia available to canoeing should there be an increase in guided tourism within the Xeni Gwet'in Caretaker Area.

In the first week of August, an assessment of Robertson Creek revealed seven major beaver dams below the road crossing by the Nemaia highway. Canoeing down from Nemaia Lake to the mouth of Nemaia Creek at Chilko Lake revealed five more dams and one major logjam, likely to limit fish migration on the main stem. By August 14th sockeye were noted in some numbers at Henry's Crossing. The week starting August 18th was spent opening beaver dams and logjams on Nemaia and Robertson Creeks (photos 18, 19 and 20).

Photo 18: Beaver dam in Robertson Creek, 2008.

Photo 19: Dam from photo 18 breached.

Photo 20: Logjam being removed from Nemaia Creek, 2008.

Both streams were inspected for signs of spawning adults or barriers at the usual locations in the weeks starting August 25th, September 1st, September 8th, September 15th and September 22nd. At no point were any sockeye observed upstream of reach 1 on Nemaia Creek in 2008. The only adult count made was on September 8th when seven dead sockeye were enumerated in Reach 1. Five of these fish were recovered and none appeared to have successfully spawned. While it was undoubtedly a poor escapement of fish, even at the prime spawning sites for sockeye in 2008, it was disappointing to have so few fish enter the Nemaia system and none observed effectively spawning. Interestingly, the situation appeared to be mirrored by the bull trout populations. Inspection of the main spawning areas on Robertson Creek through mid August until the end of September recorded no visual sightings of fish or redds. However, one bull trout was captured in spawned out condition at the junction of Nemaia and Robertson Creek on September 2nd and a redd was observed in reach one of this creek, an area where spawning had not been previously noted. Other than one bull trout caught by angling by a band member on August 7th in reach two of Nemaia Creek and reported to be in spawning colours, no other sightings of spawning bull trout in Nemaia or Robertson Creeks was recorded in 2008.

While the lack of spawning sockeye is somewhat explained by the low numbers within the Chilko system, it seems odd that bull trout should fail to show up to spawn in 2008. It was noted, however, that water levels in 2008 were substantially lower than had been observed in 2006 and 2007. An estimate of this by comparing conditions for canoeing through the various sections of Nemaia Creek could have seen as much as a one foot drop

in the previous years levels. It is possible these low water levels and flows of 2008 were a disincentive to migratory fish entering the system and may have provided temperature and oxygen levels that discourage fish from proceeding beyond the small run noted in reach one.

4.3.1 Recommendations

Despite the fact that 2008 was a very disappointing year for the migration of fish into Nemaia Creek, it is felt that the practice of stream clearance and fish counts should be continued. This is necessary to gain a lengthened view of the health and changes occurring in this system. The clearance of logjams, particularly in the rodeo grounds area, has increased flow and exposed gravel there. This area was a noted spawning area for large Chilko Lake rainbow trout historically, and the presence of a few fish there in the spring 2008 was reported by Rocky Quilt (pers-comm). It is hoped that funding can be found for spring 2009 that will allow some assessment of, and if necessary, interventions, to facilitate this welcomed improvement to fish habitat in the system.

Some monitoring of spawning rainbow trout in the section between Konni Lake and Nemaia Lake is also required, particularly to assess the impact of the barrier culvert (Holmes 2008) in this section on stock recruitment to Konni Lake.

The contribution of the Nemaia Creek system to the Chilko Lake drainage as a whole has yet to be quantified. The productive rearing habitat noted and access to spawning potential should result in a very healthy flow of juveniles of all species downstream to Chilko Lake. It would be highly desirable to have some data to substantiate and quantify such outputs from the drainage. It is suggested that a suitable downstream trapping program be instituted and maintained on the creek that will give year-to-year data of relative numbers of species migrating down stream from the Nemaia drainage.

4.4 Abelach'ez System (Site 6) (Appendix 1)

In 2007, (Holmes 2008) the discovery of salmonids in the Abelach'ez system led to a renewed interest in a drainage that, up until that date, had been considered unproductive for these species.

The main feature of this system is a large (45-ha.) lake. This was known to be of very recent origin (probably produced by beaver activity) and proved shallow, two meters at its deepest point. The lake was considered very productive and despite its shallow nature, water temperatures remained low throughout summer, due to its glacial feeder streams. A large population of whitefish were found to inhabit the lake, as were suckers and red side shiners. Extensive trapping and netting, however, produced only one bull trout juvenile and two juvenile rainbow trout. The lake is drained by a substantial stream (approx. 2 m in width) to Chilko Lake however this stream is rarely, if ever, directly connected to the lake. A high gravel bar exists (photo 21) at the outfall, built up by

prevailing onshore winds from the lake. Water filters through this bar and the low gradient of the stream at this point has insufficient energy to break through the gravel bar.

Photo 21: Gravel bar at outflow to Abelach'ez Creek.

In addition to the Abelach'ez Lake (Appendix 2-Google Earth Fig. 2) stream, a large lagoon area is impounded behind the gravel bar (Appendix 2-Google Earth Fig. 3). In effect, a very extensive rearing and spawning opportunity appears to be denied to the well known Chilko Lake population of bull trout and rainbow trout. Such warmer water habitats are in short supply in a lake that, in itself, is fundamentally of low productivity.

In 2008, it was decided to implement the proposal (Holmes) to breach the gravel bar at Chilko Lake (site 6), and try to establish at least seasonal access between the two systems allowing some freedom of movement of fry and adult fish between the two water bodies.

On August 19th, a first visit was made to the beach outfall at Chilko Lake. The gravel bar was in place and no connectivity existed. The coarse nature of the gravels ensured continuous slippage and maintaining a clear channel was difficult.

Photo 22: Trial channel cut through Abelach'ez Creek gravel bar.

The crew returned to the site on September 3rd and there was no evidence of the previously cut channel, wave activity on the lake had effectively rebuilt the gravel bar to its original level and form. As suspected, it would be required to construct a channel that had both its sides and entrance into the lake protected from slippage and wave action. Construction of this was started on September 3rd and a more obliquely angled channel was cut. The sides were then cribbed, utilizing driftwood from the beach site. Fence pole size wood was gathered and sharpened then driven into the gravels on either side of the channel, behind these vertical poles, long pieces of driftwood were secured to prevent gravel slippage into the channel. The "fence poles" on the side facing the prevailing wind were continued out into the lake to assist in preventing silting of the channel mouth by wind and wave action. The whole process is serially documented in photos 23 to 31.

Work was continued through August and September on days when the crew did not have other demands and by mid September, it was felt the channel was sufficiently established. Flow was continuous in the channel for much of the time during the construction. Whitefish, shiner and sucker fry were captured in transit between the systems. By late September, water levels in the lagoon and the input stream, observed at the road crossing at William Lulua's driveway, were so low that no water was flowing in the channel. The bed, however, remained clear and only a small gravel berm at the mouth existed, which should shift easily when flow returns (spring 2009).

Photo 23: The initial phase of construction of channel at Abelach'ez Creek gravel bar.

Photo 24: Phase 2, start of cribbing sides of proposed channel.

Photo 25: One side approaching completion.

Photo 26: Second side in place, flow starting and poles reach into the lake.

Photo 27: Poles extended into the lake and the start of willow planting along cribbing.

Photo 28: Completed restoration. View from the west.

Photo 29: Completed restoration. View from the east.

Photo 30: Planted willow along cribbing.

Photo 31: Project completed. View from the lake.

In the interest of trying to establish the channel on a permanent basis, both sides of the channel were planted with willow cuttings from the immediate area, and inserted below the water table using a bar.

4.4.1 Recommendations :

While a substantial channel appears to have been established at the entrance to the Abelach'ez system at Chilko Lake, the power of the wave action on the beach cannot be underestimated. For this reason, the channel will require continuous inspection and probably maintenance. In the spring 2009, it will be critical to visit the site to see how the structure has survived winter storms and ice build up along the lakeshore, and affect the necessary repairs.

If the channel can be maintained, even through one season, it may allow sufficient numbers of rainbow trout and bull trout into the system to establish a sustainable spawning population. If it can be established permanently, it may contribute to the well-being of salmonids in both systems. When funding permits, it would be of interest to undertake fry trapping in the lower reaches of the creek from Abelach;ez to establish if rainbow and/or bull trout are spawning within the system.

4.5 Onion lake Road Crossing (W.S.C. 150-335700-13400-57300) (Site 7) (Appendix 1)

In 2008, (Holmes) a failed road crossing was identified at Onion Lake (site 7). The seasonal stream there had become diverted and now flows down the road with little, if any, water in the original channel (photo 32).

Photo 32: Onion Lake Creek drains down the road out of channel.

This stream represents the only major contributing stream to Onion Lake, presently a stocked rainbow trout fishery

returned. Presently, representation is being made by Chief and Council at the regional and ministerial level to encourage the department to implement its responsibility.

The proposal for 2008 had presumed that the road crossing at site 7 would have been rectified and that the crew could implement their intention to improve the potential spawning areas downstream of the crossing. As no distinct course or water is presently available, this intent was not possible. The effort and time allocated to this project was therefore re-directed.

In the event of failure by the Ministry of Transport to undertake required maintenance, it was decided the the Xeni Gwet'in fisheries crew could effect at least a partial redirection of flow themselves. The creek bed was dry in September 2008 and the crew endeavoured to remodel the forded road crossing with hand tools (photos 33 and 34), such that, when spring flow returns in 2009, it will return to its original channel, not flow down the road. It was necessary to excavate the roadbed, remove graded berms on the downstream side and cut a new channel (photo 35) to access remaining sections of the old channel.

Photo 33: Crew remodelling ford crossing.

Photo 34: Remodelled ford, view downstream.

Photo 35: Channel cut off road to rec

the time allocated to the Onion Lake project to
ulations in the relevant area. This, it was felt, would
abitat assessments as required.

ater body I.D. 01190TASK), photos 36 and 37,
ce of the re-directed stream there had been visited.
re there any visual sightings. An observation of
d crossing had alerted the crew to the possibility
from this lake. Therefore, in 2008, it was decided
In September 2008, 6 baited minnow traps were
left for three days. No fish were captured, though
ates (photo 38). There were not any visual
The lake was circumnavigated and one small
sonal contributing stream was located with some gravel areas present, but there is
f a resident fish population
the depth of this lake

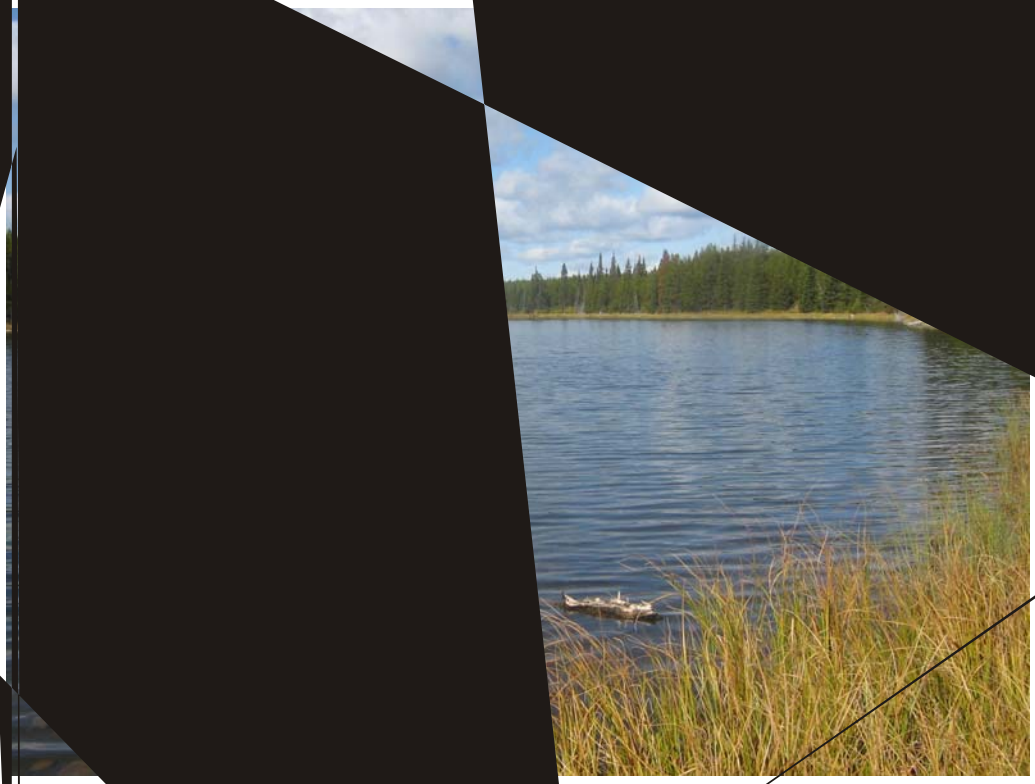

Photo 36:

Photo 37: View to southern end of lake.

Photo 38: Invertebrates caught in minnow trap at upper lake.

In 2007 (Holmes), survey of Beece Creek, the stream is clearly identified as a bull trout stream of some significance and also has a run of spawning chinook. Personal communication from Norman William, a member of the Xeni Gwet'in fisheries crew who grew up in this area remembered his mother fishing large bull trout high on Beece Creek in the fall. The 2007 survey had been limited to the lower four reaches of the stream by access issues. The road to the upper sections have collapsed and is in a dangerous condition. In 2008 this road was somewhat repaired and it was decided on September 25th to access further up on Beece Creek to evaluate habitat, connectivity and fish presence.

The crew were able to drive to a previous road-crossing site (site 8) on Beece Creek. A bridge here has long since been removed, though it was possible to ford the creek by vehicle in the low water conditions. Up to this point, no barriers exist to fish passage and from here, the crew hiked upstream a further two miles. The creek is shallow, for the most part, and bouldery with gradients between one and three degrees. There is little for pool development, however the two or three pools noted, were angled with some success. Both rainbow trout (photo 39) and bull trout (photo 40) were captured. The presence of such a large bull trout this high in the drainage adds weight to the argument that Taseko Lake bull trout may migrate into this system to spawn and it would appear there is no barriers to them proceeding very high in the system. The fish caught was quite obviously spawned out, as would be expected by this date in this locality and appears too large to be resident in the habitat noted. Such a migration would explain the traditional fishery reported by Norman William.

Photo 39: Rainbow trout caught high upstream on Beece Creek.

Photo 40: Spawned out bull trout caught above site 8 on Beece Creek.

4.5.1 Recommendations:

In spring 2009, it will be necessary to re-inspect the road crossing at Onion Lake to appraise how water is crossing the forded area and failing any input from the Ministry of Transportation, make any further interventions required. The route of the flow downstream to Onion Lake should be followed and marked such that any improvements to potential spawning habitats may be considered for future projects.

5.0 Conclusions

The Xeni Gwet'in fisheries crew has now operated seasonally for three years. In 2006 training was primarily based on gaining an intimate knowledge of the Nemaia drainage. In 2007, the crew sought to and succeeded in expanding fisheries knowledge beyond the boundaries of the Nemaia Valley to much of the northern area of the territorial claim. Add4Tw ow 0.0nd tertry oe ro6

In 2008, the crew effectively moved on from data gathering to implementation and fisheries management. This report details a series of interventions undertaken with a view to either fisheries restoration or enhancement.

It is felt that the crew, already blessed with enormous "big fish" knowledge, has learned its trade from a fry first perspective up and recognise the importance of even the smallest streams and pond areas and their connectivity. The program has substantially increased knowledge within the band members and contributed to many areas of the provincial and federal fisheries databases. Hopefully by the interventions and the reporting of fish barriers the program has been able to enhance fisheries values within the territory.

With fish at the heart of Xeni Gwet'in culture and food supply (Holmes 2006) it is hoped that funding will continue in 2009 and that the crew can expand and embark on a series of new projects.

Firstly, this report details under the individual sites, the required work to maintain and monitor the works completed in 2008. Several of these tasks have a spring component that needs to be completed and it is hoped that an early start in the 2009 season can be achieved.

There remains much to be done, as large areas of the Xeni Gwet'in Caretaker Area remain uncharted in regards to knowledge of fish species present, critical habitats and potential enhancement. Of particular importance in this regard are all the streams entering Chilko Lake south of Nemaia Creek on both the east and west shores. Where money is available, an expanded survey should be undertaken to add both local knowledge and to fisheries databases.

Monitoring of the health, productivity and any changes in the two mainstreams (Elkin Creek and Nemaia Creek) draining the heartland of Xeni Gwet'in territory is essential. To this end, there is a proposal that the crew set up a downstream trapping program on each of these creeks that would quantify outputs of salmonids from these system into the larger Fraser drainage.

The Department of Fisheries and Oceans has also been approached with a view to the Xeni Gwet'in First Nation developing a limited commercial in stream fishery in the Chilko River to add to their annual food fishery. The development of terminal fisheries is a favoured tool in fisheries management, where specified stocks of known volume and species can be harvested. This has a very substantial advantage over estuarine and ocean fisheries where large numbers of brood stocks and species, often from streams with small or seasonally impacted runs can be devastated.

The Chilko River site offers the ideal opportunity for a truly terminal fishery with a D.F.O. presence giving accurate daily run estimates. The Xeni Gwet'in maintains their traditional knowledge of the site, fisheries techniques and processing which develops a unique wind dried product. With the development of their Traditional Village site in 2008, the Information Center under construction and a desire to expand a guided tourism economy, they will develop a ready market for traditional product lines, both fish and

forest based. It is hoped D.F.O. will sanction the development of a trial fishery, which would initially allow the capture of sufficient fish to research product development and appropriate marketing opportunities.

It has as ever, been the total pleasure of Richard Holmes and Paddy Smith to have the opportunity and privilege to live and learn with the Xeni Gwet'in people in the Nemaia Valley in 2008.

Appendix 1 Google Earth Images

Appendix 2 Project Map

List of Sites

Site 1: Water diversion at Potato Mountian Choelquoit system.

Site 2: Connector stream between upper lake (Tommy's Meadow) and Choelquoit.

Site 3: Location of logjam at stream out fall, upper lake (Tommy's Meadow).

Site 4: Potential spawning site on diverted stream at Tommy's Meadow.

Site 5: Off channel habitat, Taseko River.

Site 6: Outlet of Abelach'ez system at Ckilko Lake.

Site 7: Onion Lake crossing.

Site 8: Beece Creek road crossing.

Site 9: Nemaia Valley.

Site 10: Robertson Creek.

Appendix 1


Image © 2008 Province of British Columbia
51°23'29.88" N 123°37'36.78" W
elev 4308 ft
2005

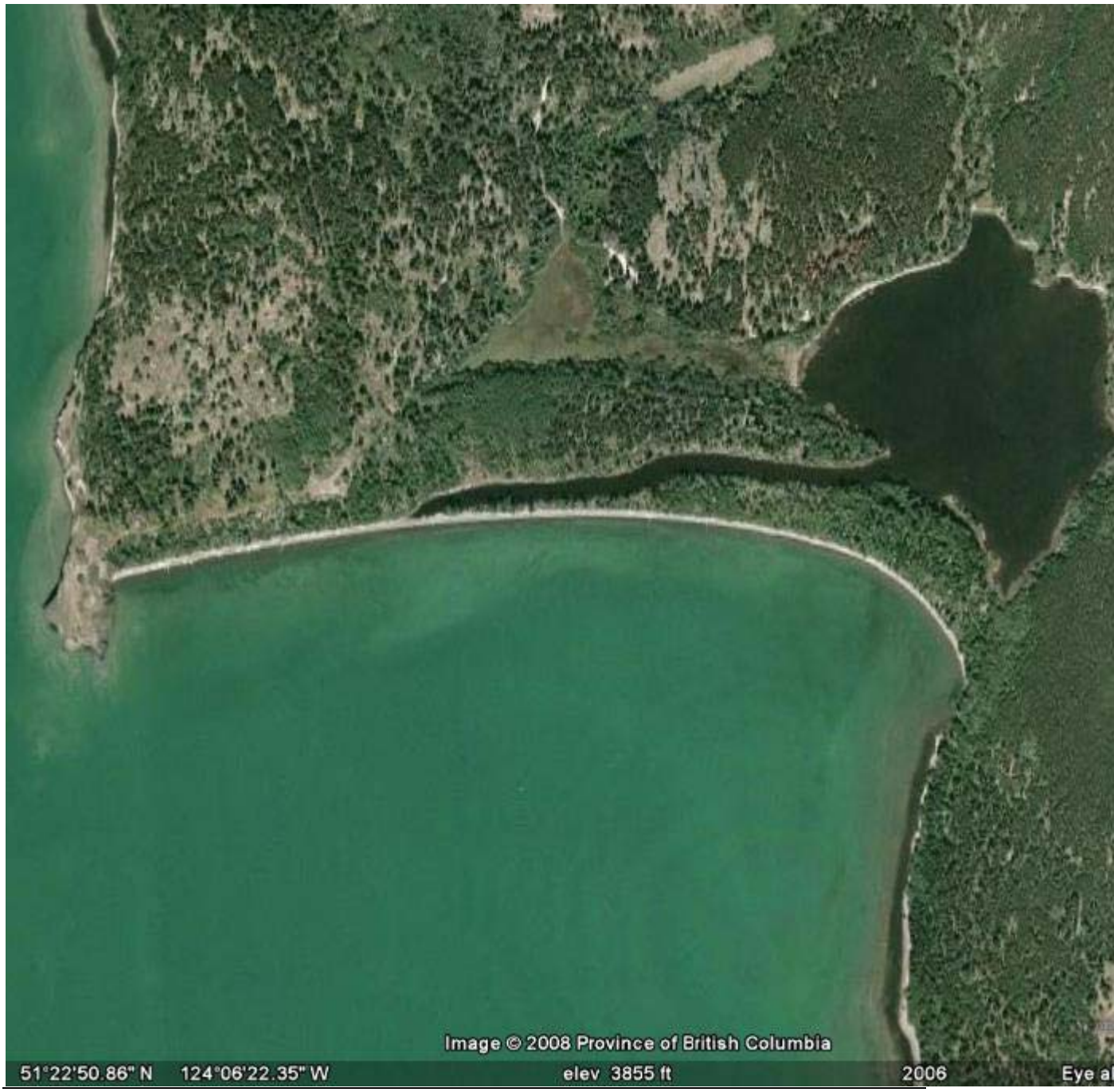
Image © 2008 Province of British Columbia
51°22'50.86" N 124°06'22.35" W
elev 3855 ft
2006
Eye al

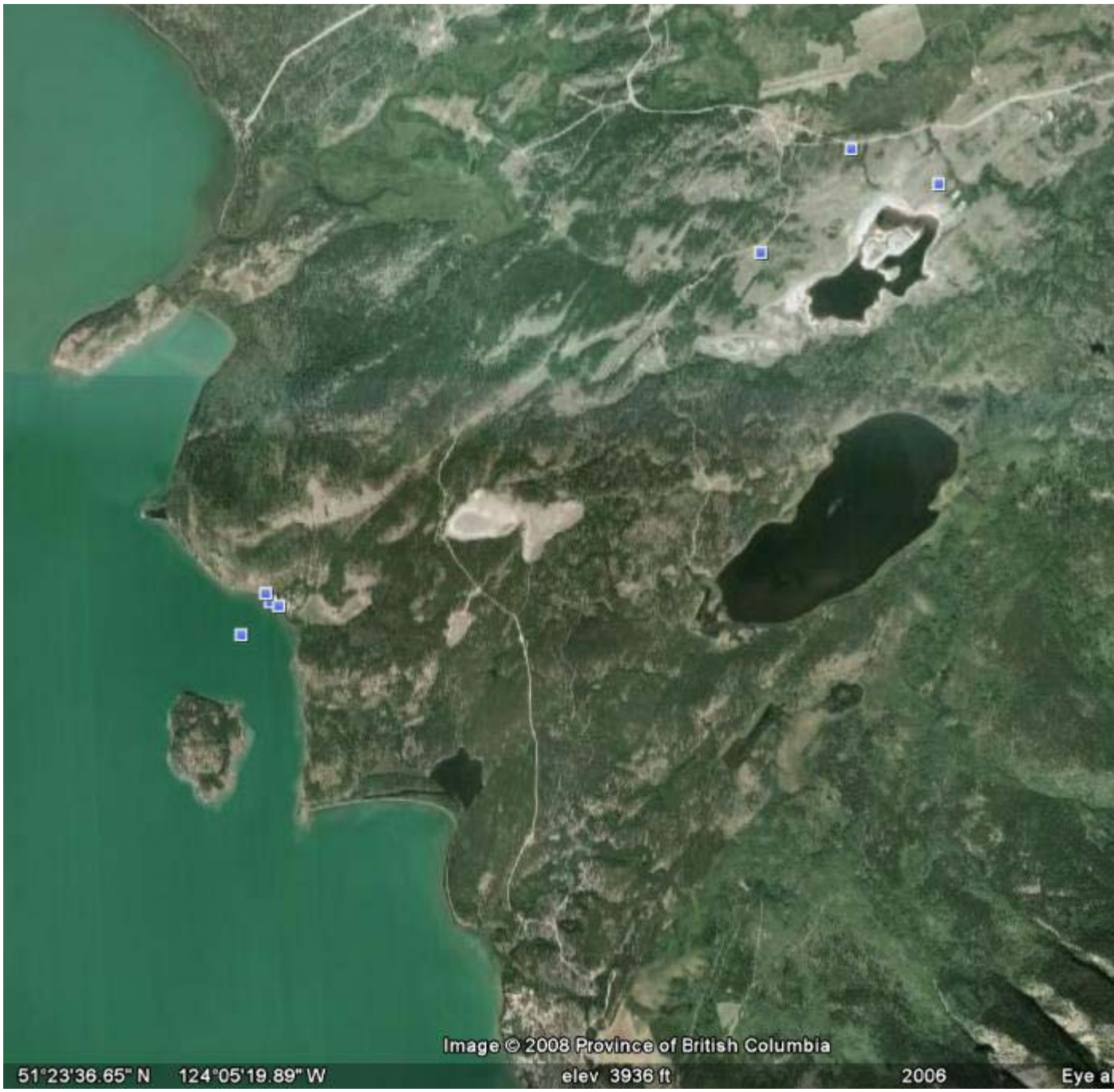
Image © 2008 Province of British Columbia
51°23'36.65" N 124°05'19.89" W
elev 3936 ft
2006
Eye a