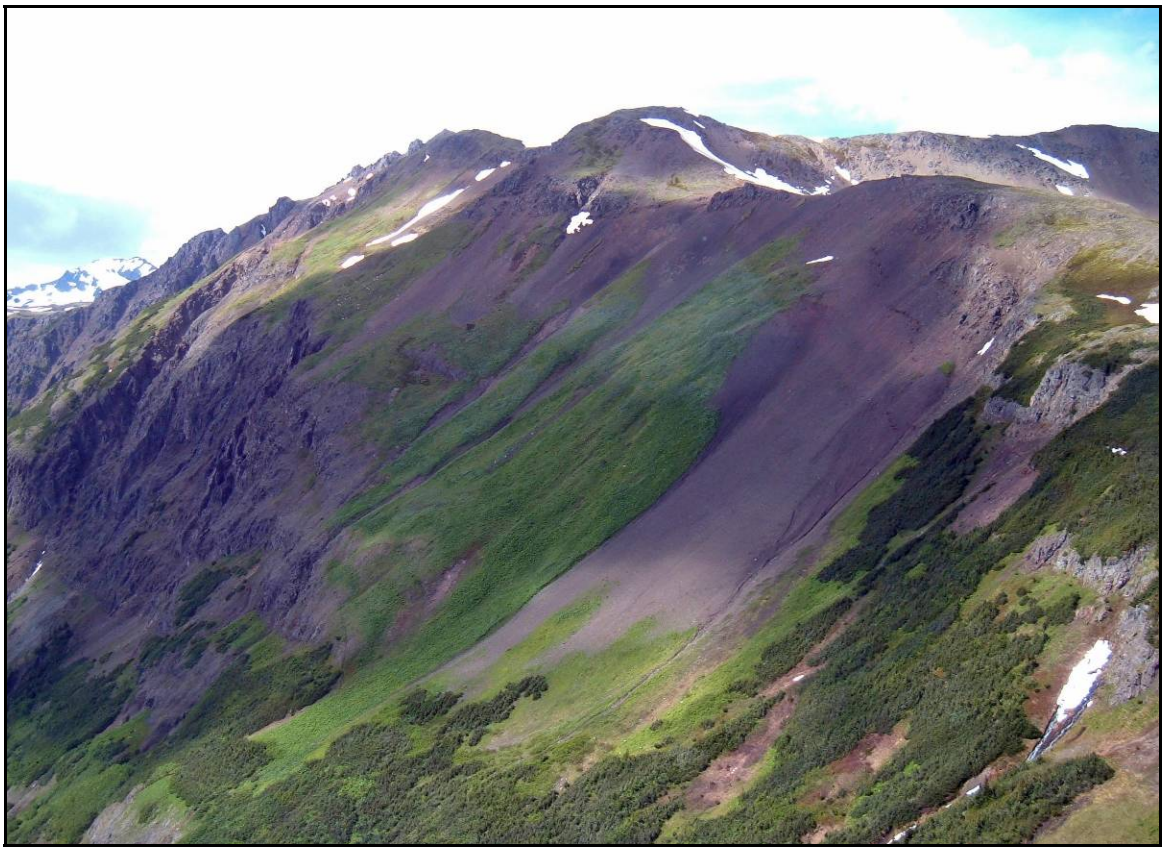


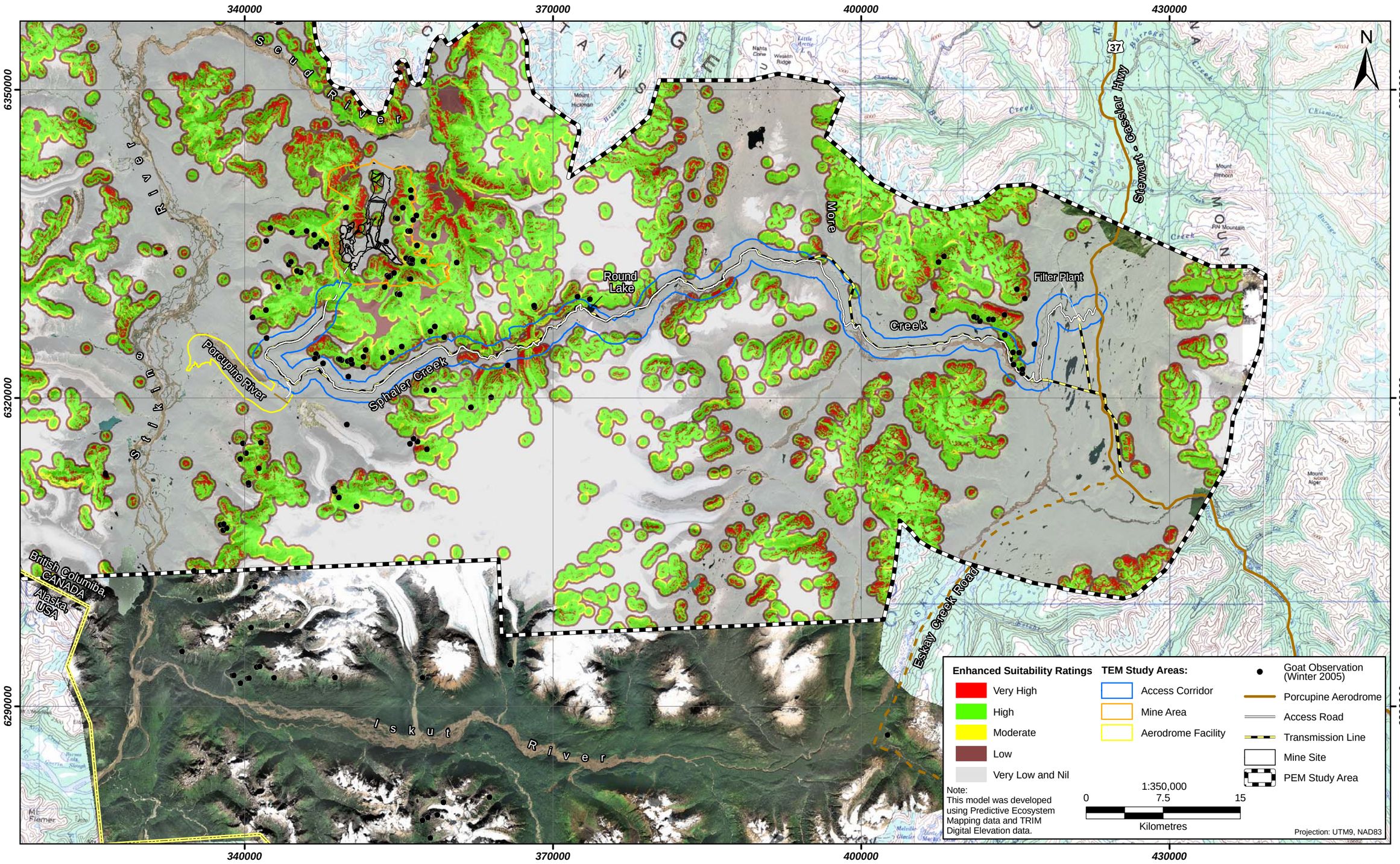
Plate 6.13-13 Highly suitable summer habitat for mountain goat, More Canyon, June 2005.

Aerodrome Facility

Given the low elevation and lack of accessible escape terrain, no suitable summer or winter habitat for mountain goats is associated with the aerodrome facility or proposed flight path along the Porcupine River.

Mine Area

Much of the escape terrain and resulting goat winter habitat identified by the TEM product in the Galore Creek Valley was isolated and primarily associated with the lower-elevation slumps and slides within the ESSFwvp and ATp BEC subzones of the valley. However, no goats were observed in this area during either summer or winter aerial flights (Figures 6.13-14 and 6.13-15). A greater amount of high-quality winter goat habitat was located along the west ridges of the mine site, and high-quality mountain goat summer habitat was identified on the north ridge of East Fork Creek within the ATp BEC zone. Goats were observed along this ridge during both summer and winter.

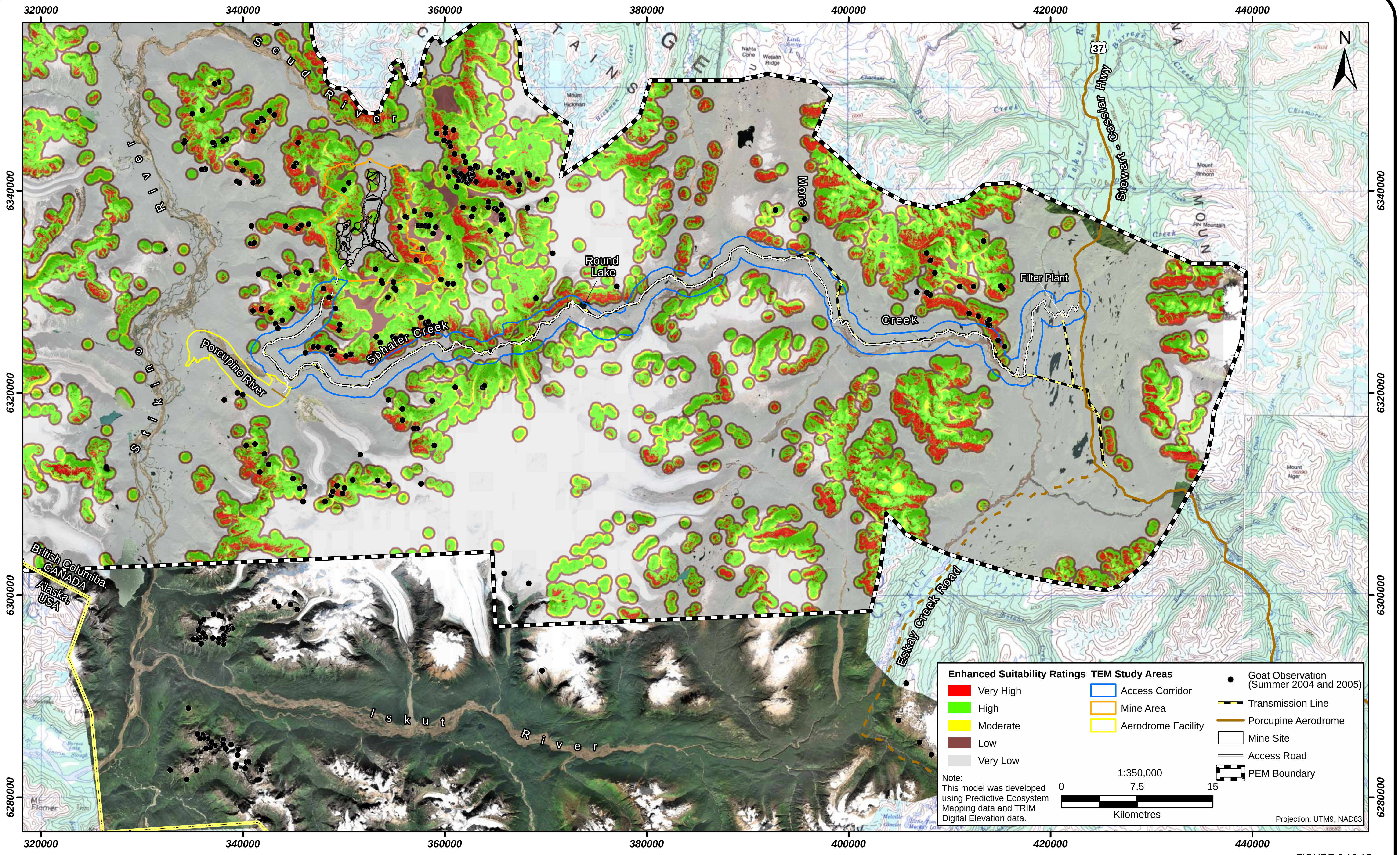


Enhanced Habitat Suitability Goat (Winter) Model and Goat Survey Observations

FIGURE 6.13-14

NovaGold Canada Inc.

Rescan



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Scud River
Stikine River
Porcupine River
Sphaler Creek
Round Lake
More Creek
Filter Plant
Stewart - Cassiar Hwy
37
Eskay Creek Road
Iskut River
British Columbia, CANADA
Alaska, USA
Enhanced Suitability Ratings
Very High
High
Moderate
Low
Very Low
TEM Study Areas
Access Corridor
Mine Area
Aerodrome Facility
Goat Observation (Summer 2004 and 2005)
Transmission Line
Porcupine Aerodrome
Mine Site
Access Road
PEM Boundary
Note:
This model was developed using Predictive Ecosystem Mapping data and TRIM Digital Elevation data.
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7.5
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Kilometres
Projection: UTM9, NAD83

FIGURE 6.13-15

Enhanced Habitat Suitability Goat (Summer) Model and Goat Survey Observations

6.13.4.3 Grizzly Bear

Grizzly bear are identified by regulators and stakeholders as one of the most important species requiring conservation consideration. Furthermore, given grizzly bear requirements for large untracked wilderness areas, the fitness of the grizzly bear population can be a measure of the ecological integrity of a landscape, and monitoring their population and habitat provides an opportunity for long-term assessment of development impacts. The focal habitat for grizzly bear includes areas that produce abundant forage during the spring, summer and fall (Figures 6.13-15, 6.13-16 and 6.13-17, respectively). Mclellan and Hovey (2001) observed the change in forage use by grizzly bear in the Kootenays through the growing season. This study noted a dependence on ungulates after emergence from the den and before vegetation flush in spring and found that grizzly bears selected grass (*Graminae*), horsetail (*Equistum* spp.) and cow parsnip (*Heracleum maximum*) at the first flush. Later in the season, as early seral stage vegetation matured, grizzly bears shifted to foraging berries in summer and fall. McLellan and Hovey were able to relate this to habitat types and suggested that grizzly bears selected riparian and avalanche chutes in spring, open forest burns and old burns in summer and riparian and forest types in fall.

Filter Plant and Access Corridor

Spring

Along the access corridor, suitable spring habitat was found within the ESSFwv and ESSFwvp BEC subzones east and west of Round Lake. The Scotsimpson Creek area was also found to support suitable grizzly bear spring habitat. This area is mainly MHmm2 and MHmmp2 subzones that include wetlands, avalanche slopes, wet meadows and riparian habitats important to grizzly bears during the spring.

Suitable grizzly bear habitat in early spring (April to late May) is associated with the low elevations of the CWH and ICH zones. The wetland and riparian areas in mid and lower More Creek provide the most favourable conditions for succulent forb and grass production. This area is further enhanced as grizzly bear spring habitat because it includes highly suitable moose winter range; moose succumbing to winter stress on winter ranges may potentially provide carrion for grizzly bears emerging from dens in early spring.

Late spring (late May to mid-June) grizzly bear habitat is represented by wetlands, wet meadows and marsh and swamp areas of the ICHwc, ESSFwv and ESSFvv BEC subzones along lower More Creek east toward the filter plant (Plate 6.13-14). Suitable late spring habitat also exists along the access road near the Porcupine River.

Summer

Along the access corridor, highly suitable grizzly bear summer habitat is found in the Scotsimpson Creek area. This includes the MHmm2 and MHmmp2 subzones and associated open canopy forests (structural stage 2 and 3), with herbs and berry-producing vegetation providing important grizzly bear summer forage. This area is enhanced for grizzly bear because it includes suitable hoary marmot habitat, indicating a potential prey source. Suitable summer habitat was also found to be interspersed throughout much of upper More Creek throughout the ESSFwv and ESSFwvp subzones. These riparian habitats and wetlands provide vegetation such

as cow parsnip and Indian hellebore as well as a variety of berry species (huckleberries, soopolallie and Saskatoons) during the summer.

Plate 6.13-14 Highly suitable late spring/early summer habitat for grizzly bear, east of Round Lake, 2005.

Fall

Suitable fall grizzly bear habitat was found mainly associated with Scotsimpson Creek, interspersed throughout the MHmm2 and MHmmp2 subzones. Important areas include avalanche paths and swamps with vegetative forage of lupine, cow parsnip and late-producing berries.

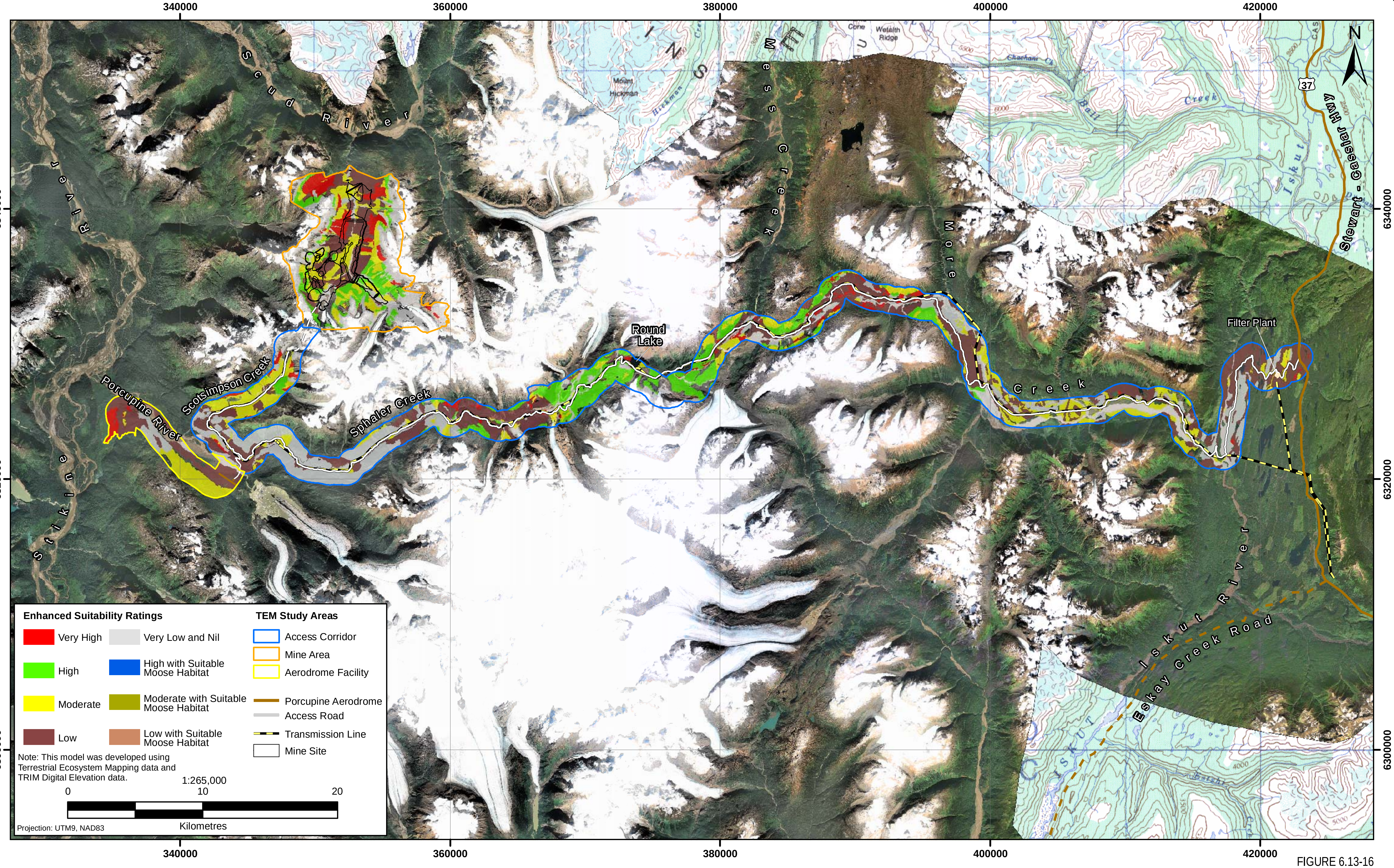
Aerodrome Facility

Spring

The aerodrome site and surrounding Porcupine River area include floodplain riverbank habitats with emerging grasses and sedges suitable for grizzly bear foraging in early and late spring.

Summer

Suitable summer habitat for grizzly bear was found within the ICHwc subzone of the Porcupine River area. Important areas include open canopy (<40%) forests where early vegetation consists of berry-producing shrubs and lush herbs.



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Porcupine River
Scotsimpson Creek
Sphaler Creek
Round Lake
Mess Creek
More Creek
Filter Plant
Iskut River
Eskay Creek Road
Stewart - Cassiar Hwy
37
N
Enhanced Suitability Ratings
Very High
High
Moderate
Low
Very Low and Nil
High with Suitable Moose Habitat
Moderate with Suitable Moose Habitat
Low with Suitable Moose Habitat
TEM Study Areas
Access Corridor
Mine Area
Aerodrome Facility
Porcupine Aerodrome
Access Road
Transmission Line
Mine Site
Note: This model was developed using Terrestrial Ecosystem Mapping data and TRIM Digital Elevation data.
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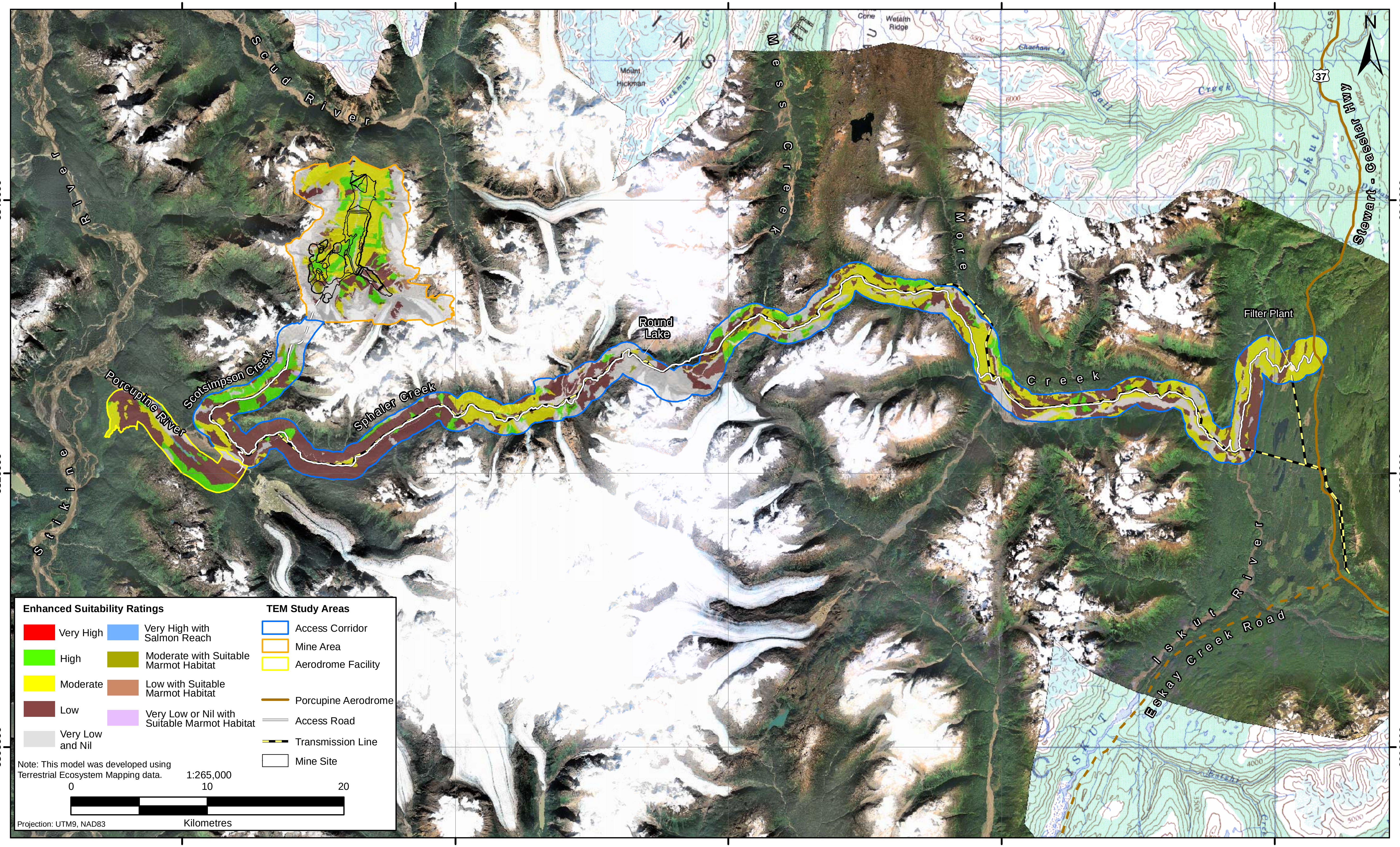
Kilometres
Projection: UTM9, NAD83

FIGURE 6.13-16

NovaGold Canada Inc.

Enhanced Habitat Suitability Model for Grizzly Bear (Spring)

Rescan



Scud River
Stikine River
Porcupine River
Scotsimpson Creek
Sphaler Creek
Round Lake
Mess Creek
More Creek
Filter Plant
Iskut River
Eskay Creek Road
Stewart - Cassiar Hwy
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6300000
Enhanced Suitability Ratings
Very High
High
Moderate
Low
Very Low and Nil
Very High with Salmon Reach
Moderate with Suitable Marmot Habitat
Low with Suitable Marmot Habitat
Very Low or Nil with Suitable Marmot Habitat
TEM Study Areas
Access Corridor
Mine Area
Aerodrome Facility
Porcupine Aerodrome
Access Road
Transmission Line
Mine Site
Note: This model was developed using Terrestrial Ecosystem Mapping data.
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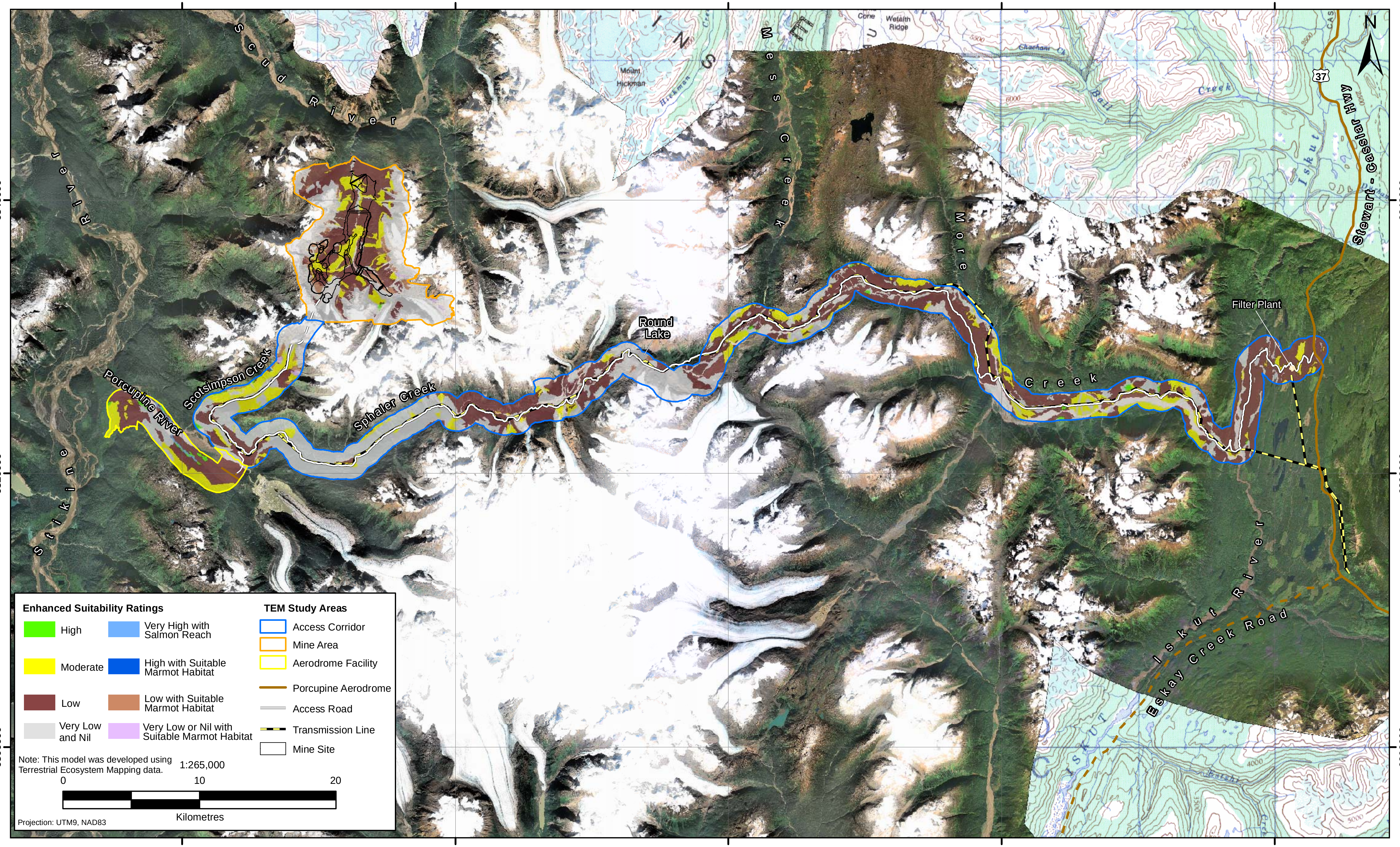
Kilometres
Projection: UTM9, NAD83

FIGURE 6.13-17

NovaGold Canada Inc.

Enhanced Habitat Suitability Model for Grizzly Bear (Summer)

Rescan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Stikine River
Porcupine River
Scotsimpson Creek
Sphaler Creek
Round Lake
Mess Creek
More Creek
Filter Plant
Stewart - Cassiar Hwy
Iskut River
Eskay Creek Road
Mount Hickman
Wetalth Ridge
Enhanced Suitability Ratings
High
Moderate
Low
Very Low and Nil
Very High with Salmon Reach
High with Suitable Marmot Habitat
Low with Suitable Marmot Habitat
Very Low or Nil with Suitable Marmot Habitat
TEM Study Areas
Access Corridor
Mine Area
Aerodrome Facility
Porcupine Aerodrome
Access Road
Transmission Line
Mine Site
Note: This model was developed using Terrestrial Ecosystem Mapping data.
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0 10 20
Kilometres
Projection: UTM9, NAD83

FIGURE 6.13-18

NovaGold Canada Inc.

Enhanced Habitat Suitability Model for Grizzly Bear (Fall)

Rescan™

In addition, the coastal grizzly bear population is extremely dependent on the Chinook and sockeye salmon resource of the Porcupine River as a summer food source. The spawning reaches identified along this river provide some of the most important habitat available to the local grizzly bear population.

Fall

Salmon-spawning streams and rivers are very important to grizzly bears in the fall. The reaches identified along the Porcupine River provide a fall food source of coho and are some of the most important habitat available to the local coastal bear population.

Mine Area

Spring

There is very little early or late spring habitat suitable for grizzly bears within the mine area. The only areas identified were the wet meadows and herbaceous avalanche paths associated with the ESSFwv and ESSFwvp subzones from mid-June to mid-July.

Summer

Grizzly bears prefer higher elevations during mid-July to early August. The TEM product identified suitable summer habitat for the coastal population of grizzly bears at higher elevations in the mine area, including important herbaceous avalanche paths, alder thickets and alpine sedge meadows within the ESSFwv and ESSFwvp subzones of the Galore Creek Valley (Plate 6.13-15). This area is also enhanced for grizzly bear by the presence of suitable hoary marmot habitat, indicating a potential prey source.

Plate 6.13-15 Highly suitable summer habitat for grizzly bear, mine area, 2005.

Fall

Suitable fall habitat for grizzly bears within the mine area includes alder thickets and berry-producing areas found within the ESSFwv subzone. Suitable denning habitat, while not modelled, was found near the mine site but was restricted to higher elevations.

6.13.4.4 American Marten

Foraging opportunities for American marten are much greater in the growing season than during winter, and marten have been documented to use a more diverse range of structural stage habitat during summer (Spencer *et al*., 1987; Buskirk and Powell, 1994). As such, winter habitat has more-limited criteria for suitability and was the focus of the modelling exercise for this species. The regional economic value of marten to fur trappers necessitated a quantification of habitat potentially affected by the development in order to assess economic impacts to individual tenures.

Marten winter habitat is characterized by a combination of vegetative features that provide arboreal and subnivean shelter as well as abundant, accessible small mammal prey. Winter prey species include voles, mice, snowshoe hares, grouse and squirrels. Vegetation that supports this habitat is generally associated with mature and old growth conifer-dominated forests with moderate to closed canopies on mesic to hydric sites. Of additional importance is the presence of coarse woody debris, which allows marten to access areas below the snow to forage and seek shelter. Standing snags and stem structure also provide arboreal refuge (Keystone Wildlife Research, 1997; Oikas Ecological Services Ltd., 1998).

Filter Plant and Access Corridor

The access corridor provides suitable winter habitat for marten, including mature to old growth conifer forests with a closed canopy (>40%) and coarse woody debris within the understorey. Highly suitable habitat was found within the MHmm2 subzone along Sphaler Creek and within the ESSFwv and ICHwc subzones from upper More Creek east to the filter plant.

Aerodrome Facility

Suitable marten habitat within the Porcupine River area was found in association with the forested areas bordering the floodplain. The floodplain itself and the proposed airstrip location do not provide suitable winter habitat for marten.

Mine Area

Within the mine area, suitable winter habitat for marten was associated with the mature and intermediate forest (structural stage 5 and 6) of the ESSFwv subzone.

6.13.4.5 Hoary Marmot

Hoary marmots provide value for grizzly bears as a prey species and are important to the local Tahltan for consumptive use. As such, identification of important habitats suitable for supporting this species is considered relevant for project evaluation. Hoary marmots are relatively sedentary, with home ranges of between 11 and 16 ha and hibernation periods that last

up to eight months of the year (Nagorsen, 2005). Focus was on modelling habitat suitable to support this species during the growing season (spring, summer and fall).

Hoary marmot growing habitat includes open alpine and subalpine areas, meadows and open forest. Habitat is further enhanced by gentle slopes on warm (west to southeast) aspects. The marmot's reliance on burrows for escape from predators, and also as a source of hibernacula, requires that suitable soils also be available. This includes deep, well-graded mineral soils where the water table is well below the surface. The presence of some boulders, talus fields for basking and foraging and free water for drinking further enhances locations for marmots.

Filter Plant and Access Corridor

Small areas of highly suitable habitat for hoary marmot were found on the upper slopes along Scotsimpson Creek within the MHmmp2 subzone. In addition, a small portion of highly suitable habitat was identified adjacent to Round Lake within the ESSFwvp subzone.

Aerodrome Facility

The aerodrome facility area does not include suitable hoary marmot habitat. The low-elevation and wet areas of the Porcupine River floodplain are unsuitable for burrows and hibernacula.

Mine Area

Suitable growing habitat for hoary marmot is not extensive throughout the mine area, but some highly suitable areas were identified in association with herbaceous meadows within the ESSFwvp subzone.

6.13.4.6 Western Toad

Western toads are classified as a species of special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In accordance with the *Federal Species at Risk Act* (SARA), habitat loss for this species that originates from a development must be mitigated. Modelling is therefore required to quantify the amount of western toad habitat that could be affected by the project. Two types of habitat were identified as important, terrestrial habitat and breeding habitat (generally aquatic).

Western toad can exploit a diverse variety of terrestrial and aquatic ecosystems and have one of the widest ranges of elevation use of all B.C. amphibians – from sea level to the alpine tundra. Suitable terrestrial areas for feeding, security and thermal shelter can include numerous types of habitat with sufficient vegetation or soft soils/litter that permit toads to remain moist and safe from predators. An abundance of invertebrates for food further enhances the value of a given habitat.

For breeding, toads require open water habitat with sufficient shallow water (<0.5 m) to support egg laying but also of sufficient depth to prevent the eggs from drying before the young toads metamorphose. Water that warms quickly in spring and remains warm through the toad metamorphosis period is of greatest value because it enhances both tadpole development and algae (tadpole forage) growth. In colder areas, this could include geothermally warmed water such as hotsprings.

Filter Plant and Access Corridor

The access corridor includes a large amount of useable terrestrial habitat for western toad. High and moderate breeding habitats were identified throughout the access corridor; confirmed breeding habitats were found within the ICHwc subzone in lower More Creek and east of More Canyon. The area from lower More Creek east to the filter plant also supports multiple moderate breeding habitat areas for toads.

Aerodrome Facility

The Porcupine River area includes useable terrestrial toad habitat. Two potentially moderate breeding habitats were located within the CWHwm subzone associated with the Porcupine River floodplain area adjacent to the aerodrome facility.

Mine Area

One potential breeding habitat area was identified within the mine area. Toad observations were reported in the mine area and were associated with non-forested wetland habitats within the ESSFwv subzone.

6.14 Archaeological and Heritage Sites

6.14.1 Regional Project Area

The Galore Creek Project is situated in the Boundary Range of the Coast Mountains, within the Canadian Cordillera physiographic region (Clague, 1989). Except for the highest peaks of the Coast Mountains, the entire region was covered by a massive ice sheet during the most recent glacial age. The ice sheet is thought to have receded relatively rapidly and to have reached the limits of glaciation existing at present by 9,500 years ago (Ryder and Clague, 1989). This is therefore the earliest time the area would have been available for human habitation.

Extensive variability in topography and climate governs the distribution of crucial plant and animal resources in the region and consequently has significant bearing on human use patterns. Typical landscape features throughout the region include glaciers and glacial moraine, alpine vegetation, subalpine parkland ecotone and dense forests. In addition, the regional study area, which lies within the Stikine volcanic belt (Clague, 1989), hosts several inactive volcanoes, numerous cinder cones and expanses of basalt and obsidian. The early use of basalt and particularly of obsidian for making stone tools is notable throughout the region. (Obsidian was highly prized as a raw material because its flaking can be easily controlled.) Important deposits of obsidian are found at Mount Edziza and the adjacent northern extent of the Spectrum Range. The area known as Artifact Valley and Raspberry Pass, just north of the study area, contains a number of rich lithic quarry/workshop sites (Fladmark, 1985).

The Tahltan people who currently live in the study area are an Athapaskan-speaking Dene group who originated in the interior and moved into the Stikine region about 300 years ago. By all historic and ethnographic accounts, the Tahltan settled in the upper reaches of the Stikine drainage system, primarily between the mouths of the Tuya and Tanzilla rivers and Glenora Creek, but used a considerably larger territory to the northwest and southeast for hunting (Emmons, 1911; Duff, 1969). The Tahltan traditionally claimed the Stikine Valley and tributaries to the mouth of the Iskut River, as well as all of the Iskut drainage system, as their hunting grounds (Dawson, 1889). Emmons recorded that the Tahltan only occasionally used the lower Stikine (below Glenora) area, however, and shared it with the Tlingit people living on the coast at the mouth of the Stikine. Teit (1906) noted the absence of any permanent settlement between Glenora and the mouth of the Stikine, likely owing to the generally inhospitable climate, almost impenetrable vegetation and lack of animal resources compared to the Stikine Plateau. He also reported that Tahltan parties on trips to and from the coast occasionally hunted in the country adjoining the Stikine River (Teit, 1906).

Before the fur trade influenced their seasonal activities, the Tahltan generally congregated at fishing sites along the Stikine and major tributaries to catch and dry fish from June until September, then dispersed into small groups of generally two families (Emmons, 1911) to hunt from October to May (MacLachan, 1981; Albright, 1982), moving camp as frequently as necessary to pursue game resources. The Tahltan were originally big game hunters when they lived in the central interior, exploiting caribou, moose, wood buffalo, black and grizzly bear, bighorn sheep and mountain goat. Caribou were of prime importance and were probably one of the major reasons the Tahltan settled on the Stikine Plateau, where caribou were abundant. However, the people quickly adapted their lifestyle to take advantage of the plentiful salmon

resources of the Stikine drainage system. A wide variety of plant materials acquired from the river valleys to the alpine were used for food, medicines and the construction of dwellings and implements (Albright, 1982; Emmons, 1911).

Gold was discovered in the Stikine Valley in 1861 and led to some sporadic prospecting activities in the region. This was followed by a greater influx of people during the Cassiar mining rush in 1874 and again during the Klondike rush of 1898.

No archaeological studies had been conducted or sites identified in the project study area before July 2005. Earlier work in the region includes several research studies to the north (Fladmark, 1985; French, 1980; Smith, 1970) and some limited development-related studies to the east and southeast (Ham, 1988; Rousseau, 1990; Simonsen, 2002; Wilson *et al.*, 1981). In total, these studies have recorded nearly 300 archaeological sites in the upper Stikine drainage basin north of Glenora, along the Tahltan River, and in the vicinity of Mount Edziza. Those in the upper Stikine consist largely of fishing and fish processing sites along the rivers and hunting sites on the plateaus. Those associated with Mount Edziza are obsidian quarrying and processing sites and some camps, possibly related to the hunting of high-elevation animal resources such as mountain goat or marmot or procuring specific alpine plants. The two recorded sites closest to the study area are HeTq-1 and HfTw-1 (Appendix 6-R, *Galore Creek Project Archaeological Baseline Assessment, 2005*). The former is a collapsed log cabin recorded on the south side of the Iskut River, east of the mouth of McLymont Creek, which contained associated debris and a magazine fragment dating to the mid-1930s. The other site is a pictograph described as two red-painted designs on a rock point only a few feet above the medium water level on the west side of the Stikine River, near the mouth of the Anuk River (Kerr, 1948).

Given the information gathered on the distribution of available resources, the past uses of the general region and the types and distributions of previously recorded archaeological sites, it has been hypothesized that the degree of use of the immediate study area would have been relatively light and would have represented peripheral presence rather than intensive activity centres. Thus, any sites identified would be expected to be characterized by small, short-term camps. Archaeological features within the study area are hypothesized to consist of lithic workshop sites related to the proximity and relatively easy access to the Mount Edziza obsidian outcrops, and more recent Tahltan sites associated with hunting or plant resource gathering. Considering the high levels of snowfall and lack of readily available food, winter use of this area is considered highly unlikely, and sites would therefore represent spring, summer or fall use.

6.14.2 Filter Plant and Access Corridor

Archaeological inventory surveys conducted in 2005 along the proposed access corridor and within limited sections of the Iskut River Valley (Figure 6.14-1) resulted in the discovery of six sites: three archaeological sites characterized by lithic scatter, a recent helicopter crash site that was required by regulations to be recorded as a site, and two Tahltan cultural heritage sites (Table 6.14-1, Plates 6.14-1 to 6.14-4. Note that researchers shown in the plates are Don Asp, a Tahltan community member, and George Kaufman, a field archaeologist). Details are provided in Appendix 6-R.

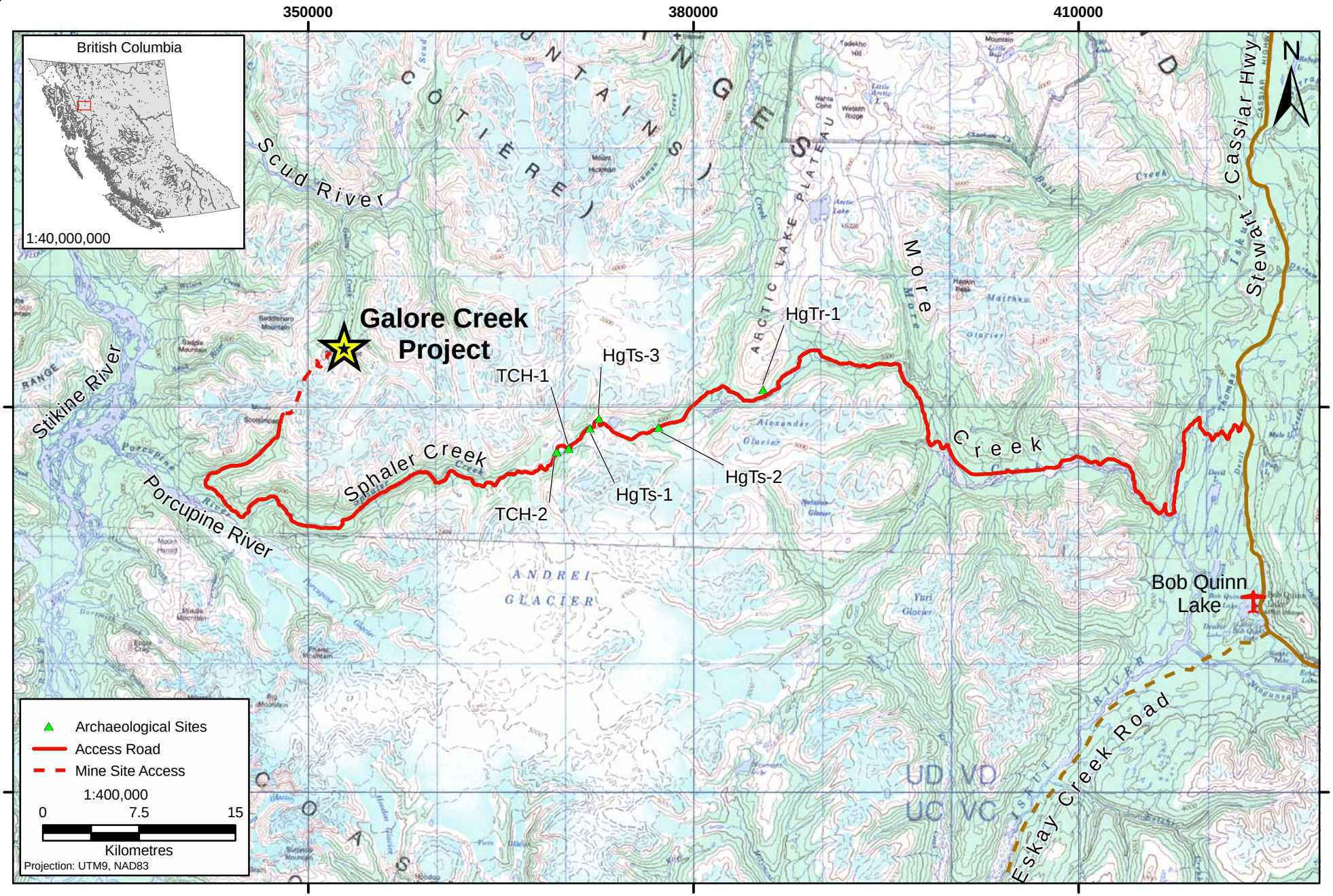

FIGURE 6.14-1

Locations of Heritage Sites Recorded for the Galore Creek Project

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Plate 6.14-1 George Kaufman and Don Asp testing at HgTs-2 looking north.

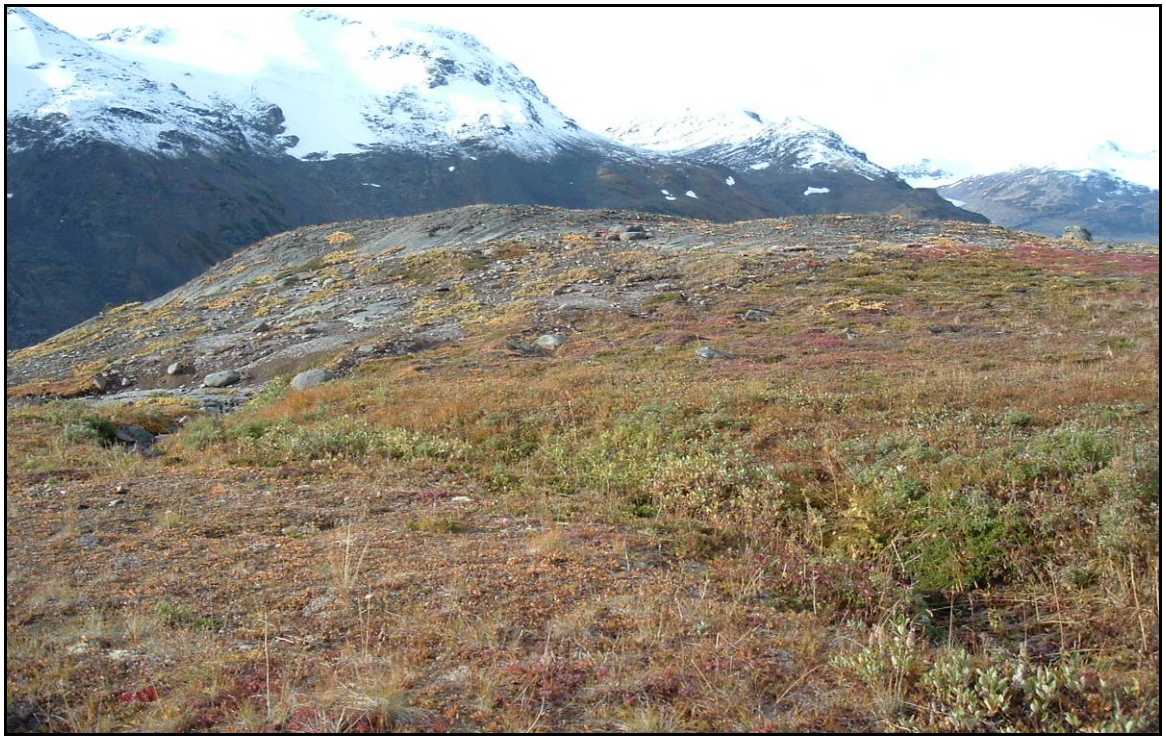

Plate 6.14-2 View of HgTr-1 looking south.

Plate 6.14-3 Don Asp and George Kaufman at cabin remains at TCH-T1.

Plate 6.14-4 Don Asp at lean-to remains at TCH-T2.

Table 6.14-1
Heritage Sites Recorded in Galore Creek Project Area

Site #	Type/Content	Location	Status
HgTs-1	lithic scatter/obsidian bifaces + debitage	Sphaler Creek headwaters	to be avoided
HgTs-2	lithic scatter/obsidian + chert debitage	More Creek headwaters	to be avoided
HgTs-3	helicopter crash/metal, glass, plastic frags.	Sphaler Creek uplands	to be affected
HgTr-1	lithic scatter/obsidian + basalt flakes	Upper More Creek Valley	out of limits
TCH-T1	cabin/wood remains, stumps	Sphaler Creek uplands	to be avoided
TCH-T2	lean-to/wood poles + wire lashing	Sphaler Creek uplands	outside ROW

These sites are all in the highlands, within the subalpine zone; no sites were found in the lower valleys (Figure 6.14-1). This confirms a number of aspects of the background information, particularly that people chose the easier travel routes, above the thick vegetation, and probably did not spend much time in the lower valleys because of the comparatively difficult surface conditions. The location of HgTr-1 on the upper side-slope of the More Creek Valley is noteworthy in suggesting that travel routes were chosen primarily on the basis of degree of vegetation cover and that the degree of slope was a secondary factor. The nature of the lithic sites, their content (Plate 6.14-5) and their proximity indicate a likely association with the Mount Edziza-Spectrum Range obsidian deposits and also suggest a possible route of travel to the south from those areas along the Mess and More/Sphaler valleys. Another noteworthy feature of these sites is their general sparse nature, suggesting short-term use and probably indicating brief hunting and/or tool repair stops. The fact that there are both lithic sites and Tahltan sites indicates continuity of use of these upper areas, albeit at low frequency. The sites most likely date to early summer or fall, when animals were present, travel was relatively easy and berries were ripe.

Plate 6.14-5 One of the artifacts found at HgTs-1.

Sites HgTs-1 and HgTs-2 were both within the proposed mine access road right-of-way. Since their discovery, the road route has been realigned to avoid direct impacts, but the sites are still in close proximity; therefore, care must be taken to avoid indirect effects. HgTs-3 is also within the proposed right-of-way. This site is a recent helicopter crash site, and most of the remains have been removed, leaving only a few bits of plastic, glass and metal. Site HgTr-1 is located well above the currently proposed road right-of-way.

One of the two Tahltan cultural heritage sites, cabin remains labelled site TCH-T1, was originally within the proposed road right-of-way. The site has been recorded and assessed by shovel testing, mapping and photography, and the road centre-line was moved so that the site is now on the edge of the right-of-way. Site TCH-T2 is a lean-to and is interpreted to be even more recent, given the presence of the wire lashing the poles together. It is a short distance just outside the proposed road right-of-way, but because of its young age it is not protected under the *Heritage Conservation Act*.

In summary, all documentary and archaeological evidence suggests that this particular area was peripheral to the intensive use areas of Mount Edziza, the upper Stikine drainage system and the Klappan Plateau. Consequently, although it has been shown that archaeological resources are present in the study area, the number of artifacts and types of sites are not as significant as those found in the regions to the north and east.

6.14.3 Aerodrome Facility

At present, no archaeological sites have been recorded in the vicinity of the aerodrome facility in the Porcupine River Valley. Preliminary overview assessments conducted in 2004 and 2005 indicated moderate archaeological potential for the valley terraces and low potential for the floodplain. Although parts of this valley were undoubtedly used in the past, repeated flooding and the alternating sediment deposition/scouring action in the valley bottom would likely preclude the possibility of finding any intact archaeological remains.

6.14.4 Mine Area

Archaeological overview assessments and ground reconnaissance of selected parts of the mine area in the Galore Creek Valley were conducted in 2004 and 2005. No archaeological remains were found, and the potential for finding archaeological resources in this valley is considered low, largely because there are no reasonable travel connections, and the possibilities for game and plant resource exploitation are limited compared to other, more accessible areas in the vicinity. Furthermore, the valley has been heavily disturbed over several decades of exploration activities, virtually eliminating the possibility of finding intact archaeological deposits, even if any sites were originally present.

6.15 Traditional Land Use

The Galore Creek Project lies within Tahltan traditional territory. Ethno-archaeological and ethno-historical evidence (Albright, 1984; Teit, 1906; Teit, 1914; Emmons, 1911; Dawson, 1889; MacLachlan, 1981) confirms that the Tahltan, Athapaskan-speaking people of Dene descent, moved into the upper Stikine region approximately 300 years ago. Tahltan traditional territory includes a large area stretching from the drainage basin of the Stikine River and its tributaries as far south as Dease Lake, the Iskut, Cottonwood and upper Rancheria rivers and the northern sources of the Nass and Skeena rivers (Emmons 1911; Teit, 1956 in Albright, 1984).

Topography, material culture and modes of subsistence are binary. Albright (1984) suggests that the diverse geographical and topographic features that are characteristic of Tahltan traditional territory resulted in unique subsistence patterns that entailed seasonal migrations to hunting, fishing and trapping areas throughout the territory. As concerns material culture, the Tahltan drew upon a variety of localized resources – plant materials, animal bone, antler (Teit, 1914 in Rescan 2006a) and obsidian from Mt. Edziza (Albright, 1984) to create, for example, items such as tools, clothing, hunting, fishing and trapping implements. Archaeological evidence suggests that the land around the localized study area (LSA; refer to Figure 6.15-1) was probably used seasonally in the pursuit of resources as they became available. Archaeological sites providing evidence of past use, and occupation in the LSA, can be expected at all elevations. These sites, however, are most frequently small, short-term camps. At higher elevations, camps were erected to exploit resources such as mountain goat, plants and/or berries and stone raw materials. Camps and sites at lower elevations could be linked to activities such as hunting, fishing, plant harvesting and wood collecting (Rescan, 2006a).

The numerous lakes, streams and rivers within Tahltan traditional territory produce a variety of different fish resources. Anadromous salmon and freshwater fish have been exploited throughout the RSA since the Tahltans first occupied the area. Fish resources, sockeye salmon in particular, are a phenomenally important economic resource for the Tahltan. Salmon resources abound throughout the RSA: they are found in the Taku River system, the Sheslay River, Tatsamenie Lake, Nahlin River and the Skeena and Nass rivers. Teit (n.d. in Albright, 1984) suggests that the value of the resource was such that it may have been a source of conflict between the Tahltan and the Kitwancool as both Nations attempted to gain access to the salmon in the area between Bowser and Meziadin lakes.

The Tahltan spent the summer months of June and July at fishing villages situated along the major salmon-producing rivers. For two to three months, large extended families gathered in one localized area to catch and dry fish, collect and dry berries and participate in a number of cultural festivities such as feasts (Albright, 1984).

While studying the Tahltans in 1904 and 1906, Emmons observed seasonal rounds of Tahltan occupancy along the Stikine. Emmons (1911) noted that the Stikine River and its tributaries are swift streams, rushing through deep gorges with precipitous walls and offering few vantage grounds for fishing. However, when access to shorelines was possible, summer huts were built of sapling, roofed with bark and branches.

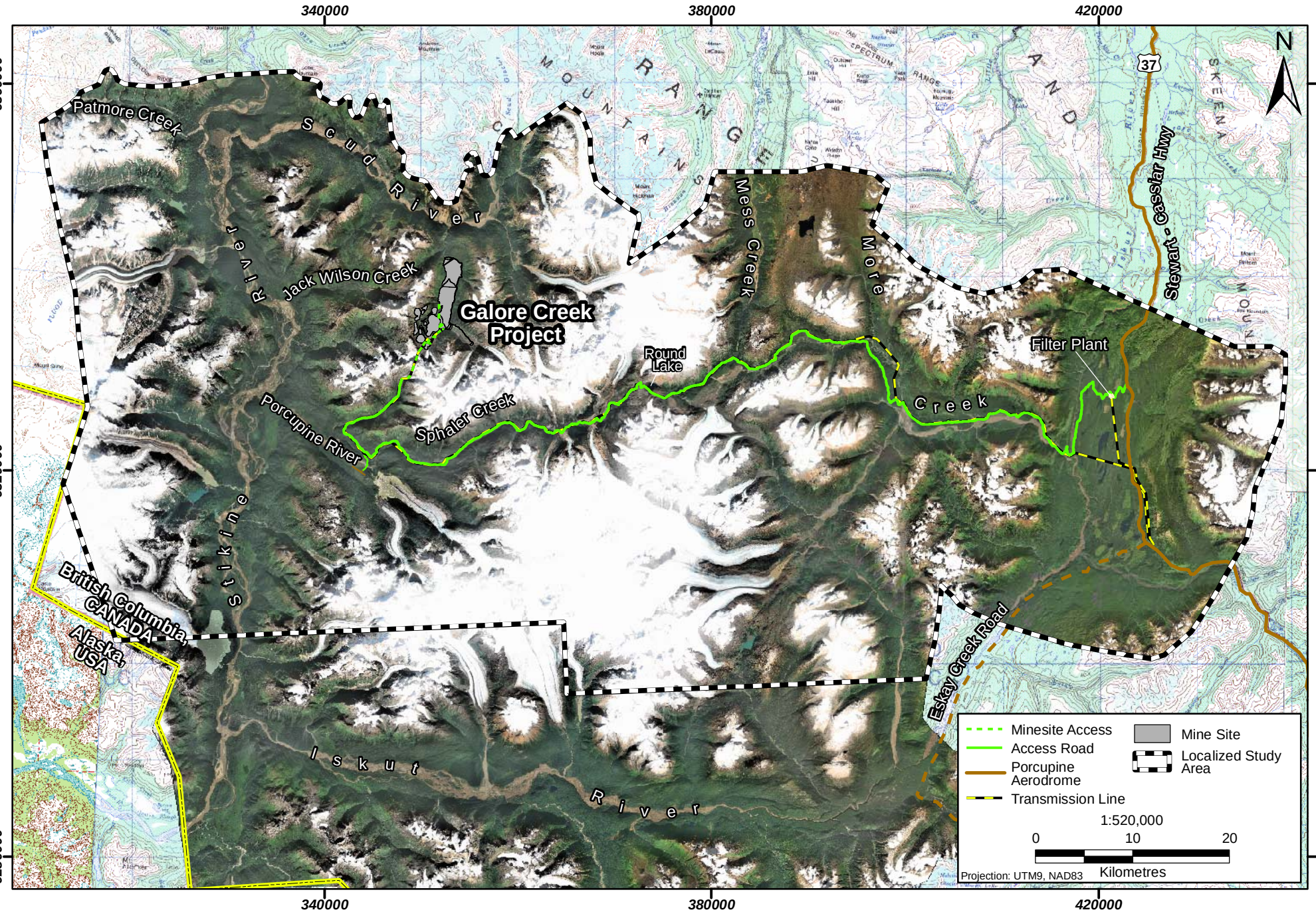

FIGURE 6.15-1

Traditional Land Use – Localized Study Area

NovaGold Canada Inc.

Rescan™

These summerhouses served both as seasonal homes and smokehouses (Emmons, 1911). While the coastal Tlingit ascended the Stikine as far north as Glenora in the summer months to engage in trade and to dry salmon and berries, throughout the winter months the Tahltan had exclusive rights and access to land and resources in the lower Stikine.

The collection of plants, berries, shoots and tenders formed an important part of Tahltan land-based economic activity. In addition to being consumed for their nutritional content, the plant materials were used as medicines (*whozeeclownah* [Noel, 1970]) and were harvested throughout the territory, most intensely during the summer months.

Once fishing season came to a close, the larger familial groups divided into smaller units and headed to more upland areas where they trapped marmots/groundhogs (*de'diah)* and ground squirrels, which, similar to fish, were dried for winter consumption. Albright notes (1984) that the Stikine plateau is one of the last remaining natural areas in North America to support such diverse as well as abundant populations of large game animals. The Tahltan, from environment and through necessity, have always been trappers and hunters (Emmons, 1911).

Big game were hunted in the fall, when "the she animals get fat" (Emmons, 1911). Members of the Tahltan Nation had designated family hunting grounds to which they returned annually. Movement throughout the territory was extensive and exhaustive: Tahltan hunters travelled around the territory and were subject not only to adverse weather conditions but challenging terrain. Many Tahltans exploited multiple family hunting grounds and often chased the herd until spring.

The Tahltan's proximity to other Nations, and the use of the Stikine as a navigation route, led to activities such as warfare and raiding, trade and intermarriage. The Tahltan enjoyed trading relationships with interior Nations and the Coastal Tlingit "…the Tahltan…acted as middlemen, exchanging goods obtained from the Tlingit for furs from the Kaska and other interior groups" (Albright, 1984). The role of the Tahltan Nation as trade facilitator was further accelerated once European merchant trade ships and Russian fur traders arrived off the coast of British Columbia. It should be noted that while the European fur trade did increase the aggressiveness of Tahltan hunting throughout the territory, what remained consistent was the importance of hunting for subsistence purposes. Traditional practices and the importance of the hunt did not diminish during this period.

There are three main communities based within Tahltan traditional territory: Telegraph Creek, Dease Lake and Iskut. Contemporary land-based economic activities (hunting, fishing, trapping and plant harvesting) continue in many regions of Tahltan traditional territory.

6.16 Socio-economic

This socio-economics chapter is derived from Appendix 6-S, *Galore Creek Project Socio-Economic Impact Assessment*. For the purposes of this socio-economic assessment, northwestern British Columbia refers to the part of the province accessible from Highway 37, from its junction with Highway 16 northward to the its junction with the Alaska Highway at the Yukon border (Figure 6.16-1). Encompassed within this description is Highway 37A and the community of Stewart. Northwestern B.C. is relatively remote from the rest of the province and supports a small population generally dependent upon the region's resource base. Except for Stewart, the residents of northwestern B.C. are largely members of the Tahltan Nation living in the communities of Dease Lake, Iskut and Telegraph Creek. Stewart and these Tahltan communities are considered to lie within the primary area of impact of the Galore Creek Project. The nearest large communities to the project site are Terrace and Smithers to the south and southeast; these communities lie within the secondary area of impact of the Galore Creek Project.

The Tahltan people represent two-thirds of the residents in the Galore Creek area and have identified the long-term viability of the regional mining sector as an essential driver for the economic, cultural and political advancement of the Tahltan Nation.

6.16.1 Regional Mine Development Planning

Northwestern B.C. is a rich geological environment where mining has been characteristic of economic activity since the 1850s. However, reliance on mining has led to a boom-and-bust pattern of population and economic growth throughout the region. Economic development is hampered by limited infrastructure, the long distance to markets, long, cold winters and a small and scattered resident population that to date has been able to provide only a limited range of goods and services to the mining industry.

The Galore Creek Project will take place in the context of the imminent closure of two mines, the potential start-up of two others and the expansion of an existing operation. The Eskay Creek and Huckleberry mines are scheduled to cease operations in 2007 and 2008, respectively, which will mean a loss of direct employment for 138 residents of Dease Lake, Iskut, Telegraph Creek and Stewart. Red Chris is scheduled for start-up in 2007, Mt. Klappan in 2008 and Galore in 2010. Development of the Mt. Klappan Project, which has entered the B.C. environmental assessment review process, is conditional upon acquisition of all certificates and permits; expansion of the Kemess mine is also conditional upon receipt of all required permits.

In December 2005, the British Columbia Transmission Corporation (BCTC) received approval to interconnect with the Coast Mountain Power Corporation Forrest Kerr hydroelectric project. This could encourage the development of other, more-distant projects.

Tables 6.16-1 and 6.16-2 summarize the data on mine closures and start-ups and related effects on employment.

NovaGold Canada Inc.

Socio-Economic Impact Areas

FIGURE 6.16-1

Rescan™

Calibre Strategic Services Inc.

Table 6.16-1
Mine Closures and Employment Losses by Community, by Year

Community	2007	2008	Cumulative
Primary Impact Area			
Iskut	35	-	35
Dease Lake*	51	-	51
Telegraph Creek	12	-	12
Stewart	35	5	40
Subtotal	**133**	**5**	**-138**
Highway 16			
Terrace	42	10	52
Hazelton	6	10	16
Smithers	74	99	173
Telkwa	10	20	30
Houston	7	72	79
Prince Rupert	3	2	5
Subtotal	**142**	**213**	**355**
Total	**275**	**218**	**-93**

*** Includes Good Hope Lake**
Adapted and Updated from BC Ministry of Small Business and Economic Development, *Northwest BC Mining Projects: Socio Economic Impact Assessment*, prepared by G.E. Bridges and Associates Inc., Consulting Economists, July 2005.

Table 6.16-2
Mine Closures and Start-Ups

	Eskay Creek	Huckleberry	Red Chris	Mt. Klappan	Galore Creek
Owner	Barrick Gold	Huckleberry	BC Metals	Fortune Minerals	NovaGold Resources
Type	silver/gold	copper/moly	copper/gold	anthracite	copper/gold
Start-Up Year	1993	1997	2007	2008	2010
Closure Year	2007	2008	2032	2028	2030
Mine Life Remaining	2 years	2 years	18 years	21 years	20 years
Mining Jobs	**278**	**214**	**256**	**247**	**553**
Contractor Jobs	**90**	**69**	**132**	**81**	**220**
Total Jobs	**368**	**283**	**388**	**328**	**773**

Adapted and updated from BC Ministry of Small Business and Economic Development, *Northwest BC Mining Projects: Socio Economic Impact Assessment*, prepared by G.E. Bridges and Associates Inc., Consulting Economists, July 2005.

It can be seen in Table 6.16-1 that closure of the Eskay Creek mine in 2007 will have the most impact on the communities in the primary project impact area. Approximately 98 Tahltan are employed at the mine. Of these approximately 25 to 30 live outside the primary impact area, in Prince George, Smithers, Terrace or other communities. The rest live at Telegraph Creek, Iskut and Dease Lake.

6.16.2 Tahltan Nation

6.16.2.1 General Demography and Culture

The Tahltan people migrated to northwestern B.C. from the Athabasca region thousands of years ago and claim extensive territorial hunting and fishing grounds. Tahltan connections to Whitehorse and the Yukon are as strong as or stronger than their connections to Terrace or other B.C. communities to the south.

The Skeena Native Development Society (2003) has documented Tahltan membership and residency characteristics since 1994. Total Tahltan membership in 1994 was 1,899, increasing by 26% to 2,387 in 2003. This population represents Tahltan membership based at Iskut, Telegraph Creek and Dease River. The population statistics presented by the Society reveal that more than two-thirds of the Tahltan people do not live at reserve locations. In 1994, 522 persons (31% of Tahltan membership) lived in the Tahltan communities of Telegraph Creek, Dease River and Iskut; this increased to 694 (29% of Tahltan membership) in 2003.[1] Of these 634 lived at Iskut and Telegraph Creek. This corroborates anecdotal evidence that a large percentage of the Tahltan have moved outside the area to acquire employment. In 2003, the total Iskut and Telegraph Creek Tahltan membership on and off reserve, was 2,229.

Not including the community of Stewart, which is primarily non-Aboriginal, approximately 200 to 300 non-Aboriginal people are believed to live along Highway 37 in 2004. The non-Aboriginal population on reserve in 2003 was 35 persons.[2] Many of the 318 residents of Dease Lake community in 2001 are believed to be non-Aboriginals, but the community is also the place of residence for a large but unknown population of Tahltan.

Populations in 2001 are summarized in Table 6.16-3.

Table 6.16-3
Summary of Tahltan Population in Immediate Impact Area

	Tahltan Population, 2003*		
	Band Membership	Resident Population	Stats Canada, 2001
Iskut	608	309	***
Telegraph Creek	1,621	325	***
Dease Lake Reserve 9	NA**	NA**	66
Subtotal	2,229	634	
Dease River	158	60	***
Subtotal	158	60	
Dease Lake Community			318
Total	2,387	694	384

*** Skeena Native Development Society (SNDS)**
**** Not available**
***** Alternative SNDS data more reliable**

[1] Skeena Native Development Society, 2003 Labour Market Census.
[2] Skeena Native Development Society, 2003 Labour Market Census.

The total population resident along Highway 37 is approximately 1,000, two-thirds of whom are Tahltan.

The remoteness of Dease Lake, Iskut, Telegraph Creek and Stewart and the limited availability of employment opportunities have contributed to extensive out-migration of residents. Some of those remaining in northwestern B.C. are employed in public service or the resurgent mining industry, but until recently unemployment rates have been high. Employment remains subject to the vagaries of outside economic influences and decisions. These negative economic circumstances are exacerbated locally by a range of social issues including low education attainment, substance abuse, lack of or inadequate local infrastructure and services, family stresses arising from spousal absences and lack of money management skills.

The extensive out-migration of Tahltan, together with cultural pressures from outside and small resident populations, have contributed to the loss of Tahltan culture among the Tahltan Nation. Stats Canada reports in its 2001 census that of the total Iskut on-reserve population of 270only about 13.0% who learned Iskut as their first language still understand it, only 12.7% speak the language at home and approximately 74.1% understand English only.

Against this background, the Tahltan see a long-term sustainable mining industry as providing the means to encourage and sustain their culture (Bridges, 2005). Key factors would be the bargaining power of First Nations who have not signed treaties, who favour economic development that will benefit the Tahltan people and culture, and who would welcome ex-patriot Tahltan back to their home communities.

6.16.2.2 Description of Tahltan Communities

Employment and economic opportunities in Telegraph Creek, Iskut and Dease Lake are largely directed and encouraged by the by the Tahltan Nation Development Corporation (TNDC), which is described further in Section 6.16.2.3. Following are brief descriptions of the current work force activities and facilities in these communities.

Dease Lake

Located 236 km south of the Alaska Highway and 83 km north of Iskut, Dease Lake is the service centre for Highway 37, with government, health, education, recreation, commercial and other services. Because of the small regional and community populations, however, services are basic.

In 2001, the Dease Lake area had a population of approximately 384, including 66 living on the nearby Tahltan reserve, Dease Lake No. 9, near the south end of Dease Lake, opposite the non-native community of Dease Lake on Highway 37. The population of Dease Lake fluctuates during the year, reflecting the seasonal nature of most employment opportunities. The

population has declined significantly since the 1990s as government services became centralized in Smithers.[3]

The TNDC headquarters are on Dease Lake Reserve No. 9. The reserve and the community of Dease Lake are the focal operating centres for direct TNDC employees, as well as TNDC construction, camp and environmental services, in Dease Lake, Telegraph creek and Iskut.

Approximately 20 Dease Lake residents are employed at the Eskay Creek mine.[4]

The Dease Lake business community has focused on the provision of goods and services to local and regional residents and to travellers along Highway 37. Businesses include accommodation, meals, gas, limited automotive repair and tourism-related activities.

Iskut

Iskut is l83 km south of Dease Lake, 163 km from the Eskay Creek mine and 20 km from the proposed Red Chris mine site. Most of the approximately 310 residents of Iskut are members of the Iskut First Nation. In 2003, only 105 people in the total work force of 152 were employed, representing an unemployment rate of 31%. About 62% of the jobs are in the public sector, followed by 30% in mining and 8% listed as "other." Iskut has a post office, a gas station and a grocery store, and serves as a staging area for the Mount Edziza and Spatsizi Plateau wilderness parks. Eddontennajon is a small non-native community adjacent to Iskut.[5]

Iskut is the home of the Iskut First Nation and is the focus of all services relating to Iskut First Nation administration, health, education, recreation and economic development. First Nation-operated construction services are equipped with one backhoe, two dump trucks, one water/dump truck and scaffolding.

The Eskay Creek mine is the single largest employer of Iskut residents, currently employing approximately 20 to 25 Iskut residents on a two-weeks-in / two-weeks-out schedule.

To date, local talent in the design and creation of traditional Iskut arts and crafts products – snowshoes and drums, for example – has not been transformed into a sustainable economic activity. No one has been available locally to spearhead or assume responsibility for economic development opportunities, and little economic development funding has been available.[6]

Local businesses at and near Iskut are heavily reliant on the tourism industry. Three lodge/outfitter establishments are supported by highway services located in Iskut.

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[3] Northwest BC Mining Projects, Socio Economic Impact Assessment prepared for BC Ministry of Small Business and Economic Development by G.E. Bridges & Associates Inc., July 2005, p.13.
[4] N. Jones, Human Resources Superintendent, Eskay Creek Mine, Barrick Gold Corporation, Personal Communication, November 15, 2005
[5] Northwest BC Mining Projects, Socio Economic Impact Assessment, Prepared for BC Ministry of Small Business and Economic Development by G.E. Bridges and Associates Inc. Consulting Economists, July, 2005, p.14.
[6] Ibid.

Telegraph Creek

Telegraph Creek is a remote community 112 km south of Dease Lake situated beside the Stikine River at the foot of the Stikine River Canyon. The population is about 350. Telegraph Creek has a nursing station, but the nearest doctor is in Dease Lake, and the nearest full-service hospital is in Terrace, more than 700 km south by road.

In 2003, Telegraph Creek had a work force of 171 people, of whom 97 were employed, yielding an unemployment rate of 44%. About 50% of the jobs are in the public sector, followed by 35% in mining and 9% listed as "other."[7]

Most of the Tahltan reserves are located around Telegraph Creek, and the community represents the heart of the Tahltan culture. Telegraph Creek is home to several Tahltan artists, including Stan Bevan, Dale Campbell and Terrence Campbell,[8] who display and sell their works through the Alcheringa Gallery in Victoria. The Tahltan Music Festival, held annually during the first long weekend in August, is another expression of the community's cultural significance; 2006 will be the fourth year of operation. The festival is growing and needs some facility improvement to sustain further development.

Telegraph Creek provides a limited number of commercial services to local residents; other social, medical and educational services are available to Tahltan residents through the Tahltan First Nation administration.

Approximately 15 residents of Telegraph Creek are currently employed at the Eskay Creek mine.[9]

Telegraph Creek has considerable potential for economic development focusing on tourism activities such as recreational fishing, photography and touring/viewing in the Stikine River Grand Canyon and Mount Edziza areas. Road access to Telegraph Creek would need to be improved to realize this potential.[10]

The lower Stikine River and its tributaries are the base for several tourism outfitters. These include Stikine RiverSong, Glenora Guest Ranch, Bear Paw Ranch Resort (Iskut) and Up the Creek Bed and Breakfast. RiverSong has facilities for canoeing and kayaking on the Stikine River, as well as for day trips and extended motor/float trips down the river through the Coast Mountains and the Stikine LaConte Wilderness Area to the Pacific Ocean and Alaska.

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[7] Northwest BC Mining Projects, Socio Economic Impact Assessment, Prepared for BC Ministry of Small Business and Economic Development by G.E. Bridges and Associates Inc. Consulting Economists, July, 2005, p.14.

[8] http://www.alcheringa-gallery.com/about.html

[9] N. Jones, Human Resources Superintendent, Barrick Gold Corporation, Personal Communication, November 15, 2005.

[10] R. Edzerza, Iskut Band Manager, Tahltan First Nation, Personal Communication, August 24, 2005.

6.16.2.3 Talhtan Economic Development

Historical

While many native and non-native residents rely on hunting, fishing and berry-picking for their primary food supply, and these activities continue to be an important part of First Nations economy and culture, the Tahltan have been consistently and regularly employed in mining endeavours since the 1850s when placer gold was discovered on the banks of the Stikine near Telegraph Creek and Glenora.

Before gold mining, archaeological evidence indicates Tahltan involvement in a number of very rich obsidian processing sites in the Mount Edziza-Raspberry Pass-Artifact Valley area.

The Cassiar gold rush from 1874 to 1876 and the Klondike gold rush in 1897 brought successive waves of miners up the Stikine River en route to the Dease Lake area. The Klondike miners were seeking an alternative route to the gold fields of the Yukon. By 1928 supplies were being delivered regularly up the Stikine by steamboat and overland into the interior via Dease Lake. The Stikine, Telegraph Creek and Dease Lake became essential links in transportation between southern B.C. and the northern interior of the province. In 1941 and 1942 the Stikine was used to transport heavy equipment and supplies during the construction of the Alaska Highway, introducing a brief influx of people.[11] Another population boom followed the completion of Highway 37 in 1972 as homesteaders moved into the Iskut-Stikine area from southern B.C. and the United States.

In addition to mining, the main sources of employment for the Tahltan have been government administration, construction and tourism (*e.g.*, guide outfitting). However, the Tahltan recognize that mining increasingly offers the best potential as an economic base in the region. Intensive exploration investment in recent years, increasing commodity prices, alternative government policy to encourage economic development with First Nations without compromising land claims negotiations, changes in tax policy – these have all led to increased mining activity in northwestern B.C.

At the same time, there is general consensus that Dease Lake and the other communities along Highway 37 are not equipped to accommodate the requirements of large-scale industrial investments such as mines. Recognizing this, organizations such as the Tahltan Central Council and the Tahltan Nation Development Company (TNDC) have taken community leadership roles in leveraging economic development opportunities to achieve a broad range of other economic, social, health, cultural and broader community sustainability objectives.

The Tahltan have made limited use of the commercial fish resources; these is no viable forestry operation in the north; mining is finite.[12] The TNDC is a therefore a tool for economic

[11] BC Ministry of Sustainable Resource Management, Cassiar Iskut-Stikine Land and Resource Management Plan, 2000.

[12] J. Asp, President, Tahltan Nation Development Corporation, personal communication, August 22, 2005.

development for the Tahltan. As expressed in *"Out of Respect,"*[13] sustainability is central to Tahltan development strategies and reflects the First Nation's determination to overcome the boom-and-bust economic and development cycles of the past. As described further below, the TNDC is determined to ensure that the Tahltan are full partners in the region's mining future.

Tahltan Nation Development Corporation (TNDC)

While non-Aboriginals tend to occupy many of the government and public sector positions in northwestern B.C., and some non-Aboriginals own businesses in Dease Lake, it is nevertheless reasonable to assert that the economy of this part of the province has been a Tahltan economy. The TNDC is the largest agglomeration of businesses and is one of the largest employers in the impact area.

The TNDC was created through the collaborative efforts of the predominantly Iskut and Tahltan populations of Dease Lake, Iskut and Telegraph Creek. Representing the Iskut First Nation, the Tahltan Band and the Tahltan Central Council, the TNDC has evolved into a major local and regional employer and a force for Tahltan economic development through its own activities and through joint-venture relationships with other companies. It has established a range of long-term initiatives geared to increasing Tahltan employment, enhancing skill levels and otherwise ensuring sustainable economic livelihoods for greater numbers of Tahltan people. The TNDC currently employs over 80 persons in roadwork and other construction and catering contracts and services.[14]

Without excluding other opportunities, the TNDC has capitalized on the economic development potential offered by the region's mining potential. The first Tahltan joint venture was with Golden Bear Mines in 1988 to upgrade and maintain the Golden Bear road. The TNDC's construction division was started with the support of provincial contracts and the Native Economic Development Program (NEDP), now Aboriginal Business Canada (ABC). The next joint venture was with Grant Stewart Construction, creating Tahltan Stewart Construction.

Since then, Spatsizi Remote Services Corporation was created to provide catering and janitorial services to the Eskay Creek mine. Spatsizi now also provides similar services to NovaGold's work camp at Galore Creek. In 2005, Spatsizi employed a total of 108 persons, of whom 43 were male and 65 were female. In 2005, 46 Spatsizi employees were engaged at Galore Creek and 62 at Eskay Creek.[15]

As discussed elsewhere, approximately 98 Tahltan are employed at the Eskay Creek mine. About half of these people are employed directly by Barrick Gold Corporation and its

[13] Tahltan First Nation and the International Institute for Sustainable Development. 2003. *Out of Respect: The Tahltan, Mining, and the Seven Questions to Sustainability*. Prepared for the Tahltan Mining Symposium by the Tahltan First Nation and the International Institute for Sustainable Development. April, 2003.

[14] Northwest BC Mining Projects, Socio Economic Impact Assessment prepared for BC Ministry of Small Business and Economic Development by G.E. Bridges & Associates Inc., July 2005.

[15] M. Fraser, Manager, Spatsizi Remote Services Corporation, Personal Communication, February 9, 2006

underground mining contractor, Procon Engineering, while the other half are employed by TNDC and Spatsizi.[16]

A joint venture (Arrow Transport) was established between TNDC and Arrow Mining Services Inc. (49% TNDC, 51% Arrow) for hauling ore to Stewart was established, but by September 2005 no Tahltan drivers were employed by the joint venture, and the one Tahltan machinist employed at Arrow's shop facilities in Stewart had resigned to take a job with NovaGold at Galore Creek. The apparent reason for the lack of employment of Tahltan with the joint venture has been the tax treatment of Tahltan employees.[17]

More recently, a joint venture (RTEC) between TNDC and Rescan Environmental Services Ltd. (50% TNDC, 50% Rescan) has been created to provide environmental monitoring services. According to the TNDC representative, about 14 to 16 people were working in 2005 and more in 2006 at Mt. Klappan, Galore Creek and for Shell Canada (coal-bed methane exploration).[18]

Frog Lake-Tahltan Oilfield Services (51% TNDC), a joint venture with the Frog Lake First Nation at Lloydminster, represents both diversification and market expansion of TNDC services. This initiative is designed to facilitate Tahltan participation in potential Alaska pipeline development, part of which would cross Tahltan traditional territory. The Frog Lake joint venture represents an expansion of services into a different but related construction sector and into a different geographic area. Few Tahltans have been employed by this company to date, but this is expected to change shortly.[19]

Construction represents a major thrust of the TNDC. The TNDC was involved in building the private, 59 km long Eskay Creek road from Highway 37 to the mine, which was completed in 1994, and has a $1.0 million, life-of-mine contract to maintain the road. The TNDC has also acquired construction contracts from Shell Canada. The TNDC hopes to establish sustainable equipment maintenance and repair facilities if it can secure enough construction contracts.[20]

The TNDC has provided training services financed through Human Resources and Skills Development Canada (HRSDC) and the Northern Lights College. Training has included chefs (Spatsizi), mechanics and carpenters.

To date, mine service and construction enterprises have formed the core of Tahltan economic development initiatives. The TNDC does have a logging licence in the Iskut Boundary Timber Supply Block, but no logging has been done since 2002, and no harvesting in the block is expected during the foreseeable future.

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[16] N. Jones, Human Resources Superintendent, Eskay Creek Mine, Barrick Gold Corporation, Personal Communication, November 15, 2005.
[17] J. Hill, Division Manager, Arrow Mining Services Inc., Personal Communications, September 23, 2005.
[18] Northwest BC Mining Projects, Socio Economic Impact Assessment prepared for BC Ministry of Small Business and Economic Development by G.E. Bridges & Associates Inc., July 2005.
[19] J. Asp, President, Tahltan Nation Development Corporation, Personal Communication, August 22, 2005 (Mr. Asp is now Consultant to the TNDC).
[20] Ibid.

The TNDC was established as a non-profit organization, but as the joint ventures started to earn revenues and profits, the TNDC could no longer maintain its tax-free status. Accordingly, in 2005 the TNDC was restructured from a Trust Fund into a profit-generating business venture, and the Tahltan Nation Commercial Development Corporation has been created as an umbrella non-profit organization that can make loans to individual entrepreneurs.

6.16.3 District of Stewart

Stewart is primarily a non-Aboriginal community on the Pacific coast that has a more diversified economy than the interior communities. Although it has an ice-free port from which ore concentrate is shipped to overseas markets, Stewart has been subject to the same boom-and-bust cycles experienced by Dease Lake, Iskut and Telegraph Creek. Stewart has been a mining centre since the inception of the town in the early 20th century. Historically, dependence on the mining industry has been pronounced, and Stewart's commercial, industrial and residential bases fluctuated with mine openings and closures. The District had a population of approximately 1,500 in the early 1980s when the Granduc/Newmont copper mine was in operation. The population collapsed in 1984 when the mine closed but increased again to approximately 1,200 in 1987 when the Premier mine was reactivated. By 1996, after the Premier mine had closed, Stewart's population fell to approximately 900 and has stabilized at approximately 700 persons since 1999.

Currently, no mines are operating near Stewart, although four mining companies are undertaking exploration activity in the region: Bell Resources Corporation (re-examining the closed Granduc mine), Tenajon Resources Corp., the Pinnacle-Mountain Boy Joint Venture and Rimfire Minerals Corporation. In 2004 Ascot Resources Ltd. purchased a large sand-and-gravel deposit at Swamp Point on the Portland Canal approximately 60 km south of Stewart. Current plans are for initial production to begin in 2006.[21]

Unlike Dease Lake, Iskut and Telegraph Creek, Stewart's economy benefits significantly from forestry, and it is a centre for the export of raw logs from the lower Stikine River and the area east of Stewart. A few small sawmills have been in intermittent operation, but lumber production to date has been insignificant. High costs have hindered development, and forest resources over much of the area have yet to be exploited. To help the forestry industry in the region, the provincial government passed an Order-in-Council to allow 35% of the raw logs from the Kispiox, Kalum and North Coast Timber supply Areas (TSAs) to be exported; the logs from these TSAs reach tidewater at Stewart.

The North Coast TSA covers 1,947,531 ha, but only 6%, or 114,000 ha, is available for long-term integrated forest management.[22] The Kalum TSA centres on the City of Terrace and covers 539,319 ha. The current allowable annual cut for the Kalum TSA is 436,884 m^3. The Kispiox TSA centres on the community of Hazelton and extends westward to Kitwanga.

[21] http://www.ascotresources.ca/presmess04.pdf
[22] http://www.for.gov.bc.ca/dnc/facts/facts.htm

Since the mid 1980s truck logging has played a major role in the community's economy and currently provides a significant share of Stewart municipal tax revenue. Throughput charges on logs shipped overseas contributed $186,000 to Stewart's revenues of $1,400,000 in 2004.[23]

While Stewart's economy is still largely resource based, Stewart also provides a regional service role that extends to Highway 37 communities. Stewart-based transportation companies haul concentrate from mills to port and have developed shop facilities that employ heavy-duty mechanics and related support personnel. Stewart has a larger industrial labour force than Dease Lake, Iskut or Telegraph Creek.

Stewart Bulk Terminals Inc. is the destination for ore concentrate transported by truck from the Eskay Creek and Huckleberry mines for transshipment to overseas markets. Eskay Creek currently ships three to five truckloads of ore concentrate daily to either Kitwanga for rail transport to Noranda, or to Stewart. The terminal currently employs approximately 7 persons full time and 20 persons part time, but employment is endangered with the expected closure of the Eskay Creek mine.

Stewart's tourism initiatives, focusing on skiing, snowmobiling, wildlife, wilderness and scenery, have led to gradual increases in the number of visitors to Stewart, although traffic in 2005 was lower than in 2004. Summer visits have fluctuated between 10,000 and 12,000 since 1999, with registrations peaking during the early 2000s. Visitor registrations at the Stewart Information Centre do not account for increasing winter tourism visitation, however, and it is understood that the overall pattern of tourism growth at Stewart has resulted from winter tourism. Stewart benefitted from the poor 2004-2005 winter season at Whistler, when more snowmobilers travelled further north to Stewart.

Snowmobilers and snowboarders represent the largest winter tourism population. With a season that extends from November through June, this has come to represent a critically important market for Stewart's accommodation sector. Some snowboarders and snowmobilers have purchased houses in Stewart to ensure availability of on-demand accommodation. Winter tourists are primarily Canadian, although some Alaskan snowmobilers are also regular visitors. Canadian traffic arrives and departs by motor vehicle; Alaskan visitors arrive and depart by boat. Winter tourism data are not available, but one hotel operator acknowledged that Stewart has accommodated as many as 100 snowmobile sleds and their owners, operators and guests on a May long weekend. Winter visitors are increasing in number. Skiers are less frequent visitors because the ski season is only about six weeks long, but Stewart businesses also receive spin-offs from the heli-skiing services at the Bell II Lodge. [24]

Summer tourists focus on sightseeing and bears. The tourists are primarily Canadian, plus a significant number of Americans stopping through on their way from Alaska to the Lower 48 and Europeans on bus tours.[25]

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[23] J. Holland, Chief Administrative Officer, Stewart, Personal Communication, October 6, 2005.
[24] J. Hyslop, King Edward Hotel, Personal Communication, January 3, 2006.
[25] Ibid.

6.16.4 Secondary Impact Area

The communities of Smithers and Terrace both have direct air and road connections to Dease Lake and the other primary impact communities, and provide a range of public and private sector services to northern residents and communities. Smithers has evolved as a mine service centre for northern B.C. Terrace also provides some mine services but also offers a spectrum of government, health, educational and other infrastructural services to northwestern B.C. Residents of Highway 37 communities tend to purchase goods and services from Terrace. From a consumer perspective, Highway 37 communities are located within the economic hinterland or service area of Terrace; from a business and mine service perspective, Highway 37 communities are more likely to fall within Smithers' business hinterland than Terrace's.

6.16.5 Land Use

6.16.5.1 Traditional Activities

The Galore Creek Project is located within Tahltan Traditional Territory, which has been and continues to be used by Tahltan people. The Territory extends from the drainage basin of the Stikine River and its tributaries as far south as Dease Lake and the Iskut and Cottonwood rivers; the upper Rancheria rivers; and the northern sources of the Nass and Skeena rivers.[26] This large area supports a wide variety of wildlife, fish and plants that have served as basic sustenance and material resources for the continued presence of the Tahltan in their Territory. However, the archaeological evidence suggests limited historical use of land in the immediate Local Study Area (LSA) (see Sections 6.14 and 6.15 for more detail).

Fishing and hunting continue to be important economic activities for Tahltan people throughout the Regional Study Area. Individuals and families occupy numerous traditional fishing camps along the Stikine River and other waterways during the salmon spawning season; the extent of current use of waterways in the LSA is unknown. Moose are also considered to be an extremely important food source and are hunted locally, generally in areas accessible by road, snowmobile or ATV. Hunters routinely acquire moose for themselves, their immediate families and their extended families. Few of the traplines within the study area have been active since the 1950s, although some have been leased and worked by individuals other than the registered owners.

Because of the lack of road access, there is little harvesting of country foods within the project area at present. The level of harvesting is expected to increase when the project access road becomes available. The primary users of country foods in the project area are the Tahltan. In total, 27 plant species and two species of fungi have been identified as country foods harvested and used for medicinal and nutritional purposes by the Tahltan. [27]

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[26] Emmons, G.T. 1911. The Tahltan Indians. In: *University of Pennsylvania The Museum of Anthropological Publications* Vol. IV, No. 1; Teit, James. Tahltan Tales. In: Albright, Sylvia L. 1984. *Tahltan Ethnoarchaeology*. Department of Archaeology, Simon Fraser University, Burnaby, B.C. Publication Number 15.

27 Rescan. 2006. Galore Country Foods Baseline Assessment. Prepared for NovaGold Canada Inc. Inc., January 2006, p.2-1.

6.16.5.2 Commercial Activities

Apart from some small, privately held parcels of land along the Stikine River, almost all of the land in the Regional and Local Study Areas is held by the Crown. There are a number of interests on the land, as expressed through land reserves (*e.g.,* Protected Areas), traplines, guiding territories and grazing permits.

Mining

From a commercial perspective, the Stikine-Iskut area is one of the richest and most actively exploited for mineral exploration in British Columbia. The area has numerous known mineral deposits and widespread staked mineral claims.[28] As listed in Table 16.6.1, several mines are currently in operation or planned for development in the region, and planning is underway for an expansion of the Kemess mine. The Golden Bear and Snip mines have recently closed. Other intermittent mineral-based operations include three jade quarries and several sand and gravel pits.

In addition to mineral resources, there is moderate to high oil and conventional gas potential, though no development, in the Telegraph Creek and Klappan areas, and Shell Canada is actively drilling and investigating methane gas potential in the Mt. Klappan area.

Forestry

The Tahltans have held the timber licence for harvesting near Bob Quinn and Devil's Creek since February 1, 2002, but have not undertaken logging operations. Two independent operators are currently harvesting approximately 250 m^3 of timber from a burn area as well as standing green timber from within designated harvest areas. The TNDC holds the licence to log in the Iskut Boundary Timber Supply Block, whose annual allowable cut is 120,000 m^3 per year. No harvesting has been done during the past three years, however, and none is planned for the foreseeable future.[29]

In 2005, Coast Mountain Hydro Corp harvested some timber along its access road in the Forrest Kerr-Iskut River area. Other logging is actively carried out south of Bell II, and several portable sawmills operate intermittently in Dease Lake, Iskut and Telegraph Creek, primarily for domestic consumption.

Guiding and Outfitting

Two hunting guide outfitters have tenures that fall within the study area. One has stated that although the hunting area falls within the Galore Creek study area, he does not actually use it.

Both companies market the wilderness and the pristine character of the northwest and expressed concern that road access, even gated, would allow hunter access into the tenured areas. This

[28] June 2005 Galore Creek Project Description Canadian Environmental Assessment Agency, NovaGold Canada Inc. 2–30 Rescan™ Environmental Services Ltd. (Proj. #670-2), p.3-39.
[29] C. Rygaard, Timber Tenures Specialist, Dease Lake, BC Ministry of Forests and Range, Personal Communication, February 21, 2006.

concern was based on the experience of hunter access on the gated Muddy Lake/Golden Bear road and the disruption to big game caused by construction and operation access. One company indicated having lost its first client because of the access issue.

Recreation and Tourism

The Cassiar Iskut-Stikine Land Management and Resource Management Plan (LRMP) of 2000 created 14 new Protected Areas in the study area, covering a total of 441,552 ha of land; most of those areas are also intended for recreational use. [30]Extensive areas of wilderness, remote rivers, striking viewscapes and excellent conditions for backcountry recreation support a small nature-based tourism sector. Approximately 600 people visit Mount Edziza Park, Spatsizi Park and the Stikine and Mt Edziza Recreation Areas every tear.[31]

As discussed in Section 16.6.3, tourism along the Highway 37 and 37A corridor attracts visitors from Canada, the United States and overseas. The region has substantial potential for increased recreation and tourism, during both summer and winter. [32]

6.16.6 Transportation

Concentrate from the Galore Creek process plant will be transported by truck along Highways 37 and 37A to port facilities in Stewart. Highway 37 runs northward from Kitimat and Terrace to the Yukon and is one of two overland routes to Alaska. The distance from the junction with Highway 16 in the south to the junction with of the Alaska Highway in the north is 727 km (454 miles). Highway 37A branches off the main highway at the Meziadin Junction and runs to Stewart.

Most of Highway 37 is hard surface (either pavement or sealcoat), but some sections are gravel. Road conditions vary depending on the weather and the time of year. Since the late 1990s, the B.C. Ministry of Transportation has managed highway upgrading and repairs, particularly north of Dease Lake. No weight restrictions have applied to Highway 37 south of the Eskay Creek mine access road in 2005, and no weight restrictions will apply anywhere on Highway 37 after 2006. The entire roadway is expected to be hard surfaced by 2008-2009.[33]

Highway 37A is a paved highway and is considered to be in good repair. No weight restrictions apply. The highway is designed to accommodate the current levels of mining and logging and would likely need more maintenance effort if traffic levels were to increase significantly. Increased traffic is also likely to trigger a re-examination of the highway, paying particular

[30] June 2005 Galore Creek Project Description Canadian Environmental Assessment Agency, NovaGold Canada Inc. 2–30 Rescan™ Environmental Services Ltd. (Proj. #670-2), p.3-35.
[31] BC Ministry of Sustainable Resource Management, Cassiar Iskut-Stikine Land and Resource Management Plan, 2000.
[32] June 2005 Galore Creek Project Description Canadian Environmental Assessment Agency, NovaGold Canada Inc. 2–30 Rescan™ Environmental Services Ltd. (Proj. #670-2), p.3-41.
[33] W. Maitland, BC Ministry of Transportation, Dease Lake, Personal Communication, August 23, 2005.

attention to curves and sight lines, and the possible need for capital expenditure for improvements.[34]

Without further economic development, consistent traffic data for Highway 37 from the mid 1990s suggest that traffic along Highway 37 is likely to continue at approximate ±670 vehicles per day annually (average annual daily traffic, or AADT)[35] and ±860 vehicles per day during the summer (summer average daily traffic, or SADT)[36] south of Dease Lake; and ±500 AADT and ±650 SADT immediately north of Meziadin Junction. Highway traffic counts are unavailable for Highway 37A.

Increases in traffic along Highway 37 are most probable if the proposed mine developments in northwestern B.C. (and Yukon) become operational. Closure of the Eskay Creek mine will reduce truck traffic on Highway 37 and 37A to Stewart by three to five trucks (six to ten trips) per day. Transport of copper concentrate from the Huckleberry mine to Stewart comprises approximately ten trucks per day, but will terminate when milling stops in 2007.[37] The Huckleberry traffic has no effect on Highway 37 traffic north of Meziadin Junction. After 2007, the reductions in Eskay Creek and Huckleberry mine truck traffic will be most notable on Highway 37A.

Beginning in 2006, Yukon Zinc will transport concentrate to Stewart, possibly followed by Red Chris in 2007, Mt. Klappan in 2008 and Galore Creek in 2010. Galore Creek traffic alone will approximate 50 trucks per day (100 round trips). From all of these mining operations as many as 95 trucks will be making 190 round trips daily to port facilities at Stewart in 2010.

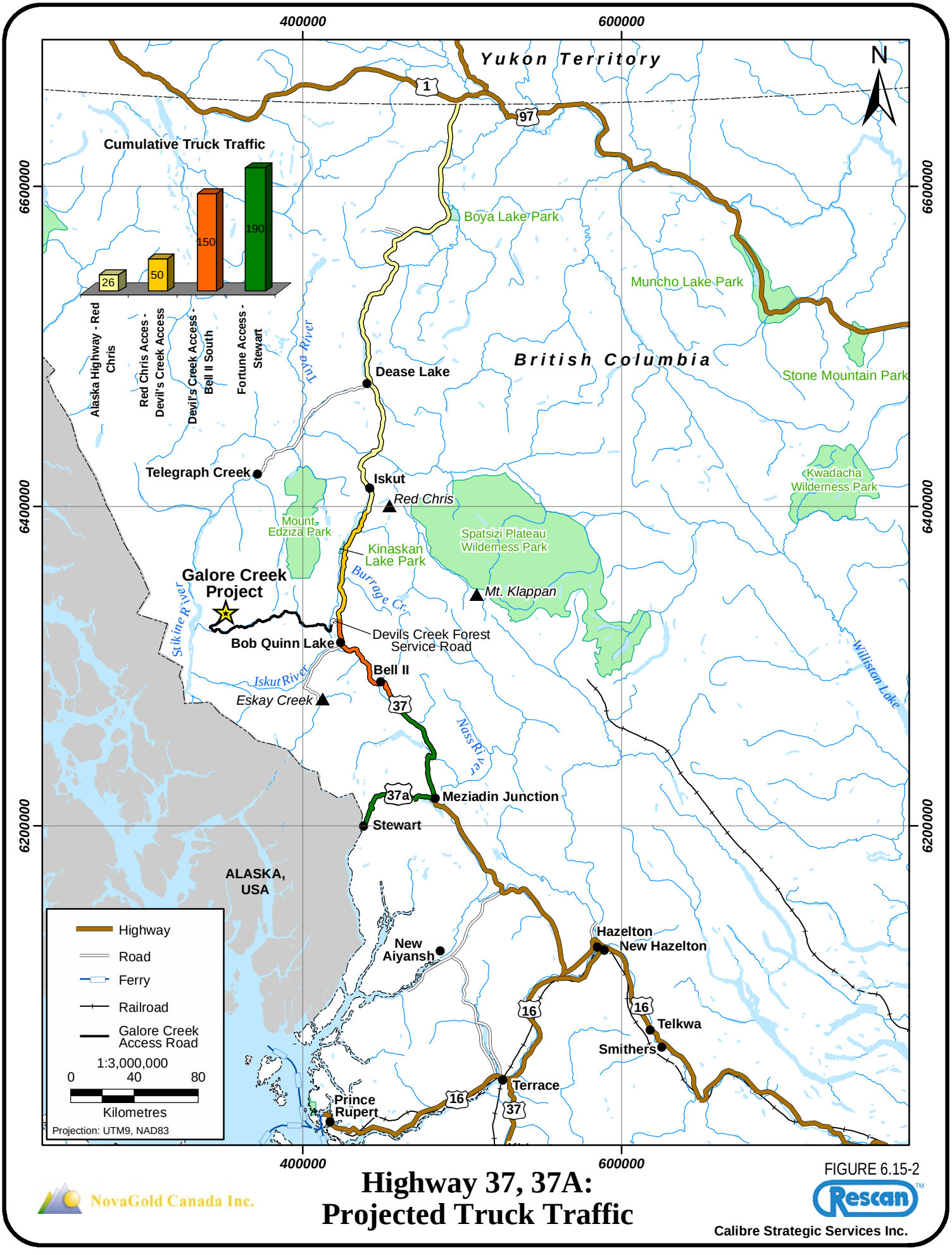
Projected increases in truck traffic along Highway 37 and 37A are presented in Figure 6.15-2.

34 G. Nelson, District Area Manager, Smithers, BC Ministry of Transportation, Personal Xommunicatiopn, February 9, 2006.

35 AADT: Average Annual Daily Traffic.

36 SADT: Summer Average Daily Traffic.

37 Imperial Metals Corporation, Annual Information Form, 2005, p.37 http://www.imperialmetals.com/s/Huckleberry.asp



Highway 37, 37A: Projected Truck Traffic

FIGURE 6.15-2

NovaGold Canada Inc.

Rescan™

Calibre Strategic Services Inc.

6.17 Country Foods

There is currently little harvesting of country foods within the project area because there is no road access; however, this is expected to change as project development brings more people into the area. Therefore, a baseline assessment of country foods was conducted. The assessment estimated the quality of country foods prior to project development and thus is reflective of naturally occurring levels of metals. Although it does not predict future potential risks, it does provide a baseline for additional future country foods assessments if changes in soil and water quality are found in association with mine development and operation. The following paragraphs present the main findings of the baseline assessment. Detailed methodology and results can be found in Appendix 6-T, *Country Foods Baseline Assessment*.

The primary collectors of country foods in the vicinity of the project are community members of the Tahltan Nation and are therefore the human receptors evaluated in this baseline assessment. To facilitate this assessment a series of interviews were conducted with Tahltan members.

The following country foods, all of which are found within the project area, were evaluated: caribou weed (leaves/stems) (*Artemesia spp.*), blueberry (berries) (*Vaccinium spp.*), moose (muscle tissue and organs), hoary marmot (muscle tissue), grouse (muscle tissue) (*Phasiandidae spp.*) and salmon (muscle tissue). These species were identified as the most frequently consumed country foods or are of cultural importance to the Tahltan. The focus of the baseline assessment was on metals, primarily because these are the only contaminants of potential concern (COPCs) at present and have been measured in environmental media. Seventeen metals of potential concern were evaluated (Al, As, Ba, Cd, Cr, Co, Cu, Pb, Mn, Mg, Hg, Mo, Ni, Se, Sr, V, Zn).

This study predicted no unacceptable risks to human receptors from consumption of caribou weed, blueberry, animal muscle (moose, marmot and grouse) and salmon muscle under the baseline exposure scenarios evaluated. Based on the empirical and estimated levels of metals in these foods, the amounts currently consumed are within the recommended maximum weekly intakes (RMWIs) (Table 6.17-1). Thus, people may safely continue to eat these country foods in a manner consistent with Tahltan tradition. This should provide Tahltan members with a level of comfort with regard to their consumption of these country foods.

Potential unacceptable risks to human receptors (toddlers and adults) were found for the consumption of moose organs under the baseline exposure scenario evaluated (28 servings per year) (Table 6.17-2). However, due to the conservativeness in the assumptions made in estimating the organ tissue concentrations, the potential risks have likely been overestimated and the RMWIs underestimated. Nonetheless, elevated baseline concentrations of metals in the kidneys and livers of wildlife have been measured in various parts of Canada.

The only way to reduce the uncertainty in predicted moose tissue concentrations is to sample and analyze moose tissues from the project area to establish actual baseline concentrations. Sampling and analysis could be conducted by Health Canada in conjunction with the country food harvesters. The more certainty there is in the baseline risks, the easier it will be to assess additional risks (if any) from mine development and operation.

Table 6.17-1
Comparison of Current and Recommended Maximum Weekly Intakes of Animal Muscle, Caribou Weed and Blueberries

Country Food	Human Receptor	Currrent Servings Per Week	Maximum Servings Per Week
Moose Muscle	Toddler	6	88
	Adult	6	162
Marmot Muscle	Toddler	0.2	48
	Adult	0.2	4365
Grouse Muscle	Toddler	0.6	16
	Adult	0.6	29
Caribou Weed	Toddler	3	74
	Adult	3	136
Blueberry	Toddler	0.8	7
	Adult	0.8	12

Table 6.17-2
Comparison of Current and Recommended Maximum Annual Intakes of Moose Organs

Country Food	Human Receptor	Currrent Servings Per Year	Maximum Servings Per Year
Moose Organs	Toddler	28	4
	Adult	28	8

6.18 Traditional Knowledge Studies

The NovaGold Galore Creek Project is located within an area of Tahltan Traditional Territory that has been used and continues to be used by the Tahltan. Tahltan Territory as defined by Tahltan Elders covers 96,000 sq. miles (Isaac, 1995). The Tahltan are an Athapaskan-speaking people of Dene descent, who moved into the upper Stikine region approximately 300 years ago. In contemporary terms, Tahltan Traditional Territory includes a large area stretching from the drainage basin of the Stikine River and its tributaries as far south as Dease Lake, the Iskut, Cottonwood; upper Rancheria Rivers; and the northern sources of the Nass and Skeena Rivers (Emmons, 1911; Teit, 1956; Albright 1984). This is an extensive area which has supported and continues to support a wide variety of wildlife, fish, and plants; these basic sources of sustenance and materials have been critical for the continued presence of the Tahltan Nation in their Territory. Within current Tahltan Traditional Territory there are three main communities based in Telegraph Creek, Dease Lake, and Iskut. Traditional Knowledge studies were conducted in a way that invites and considers input from people with Traditional Knowledge of the project area towards this environmental assessment. The acquisition and use of Tahltan Traditional Knowledge is addressed in the Participation Agreement between NovaGold and the Tahltan Central Council.

Traditional Knowledge is particularized, localized and experiential knowledge; it is owned by those who breathe its expression in actions. Traditional Knowledge is often developed as an intellectual response to the necessities of life (WIPO, 2005) and thus falls under intellectual property rights. Including Traditional Knowledge in developments creates comprehensive studies. As articulated by Johannes (Johannes, 1993), "locations of rare or endangered species are more likely to be identified by local resource users than by outside researchers… Animal migration pathways and aggregation sites known to local people may not always coincide with areas judged to be important based on common criteria for identifying sensitive areas" (Johannes, 1993).

Individuals and families who are most dependent on local resources for spiritual, cultural and basic needs are often best positioned to not only articulate the importance of certain places and spaces, but also share valuable knowledge that is grounded in learned experience. In this light, in the winter of 2003, NovaGold began working with Tahltan community members and Tahltan Elders as a means of gathering Traditional Knowledge about both the broad Cassiar Iskut-Stikine region and the local project area.

In 2005, NovaGold employed two Tahltan community researchers to undertake desk and fieldbased research. Additionally, NovaGold funded an archival project so that a Tahltan archivist could work full-time collecting, documenting, and transcribing invaluable Tahltan Traditional Knowledge. Once completed, the Tahltan Central Council will have the beginnings of a comprehensive Tahltan Traditional Knowledge archive located in Dease Lake.

The objectives of the Tahltan Traditional Knowledge research program for the NovaGold Galore Creek project were to:

- complete a comprehensive qualitative and quantitative study

- build relationships with the Tahltan Nation
- create opportunities for capacity-building among Tahltan community researchers
- consider and incorporate Tahltan Traditional Knowledge provided by the Tahltan Nation into the planning and decision making for the Environmental Assessment (EA) Application and as it relates to completing the EA.

6.18.1 Study Methodology and Consultation

The Tahltan community researchers drew on a variety of standard social science methodologies to obtain quantitative and qualitative data. The initial step the researchers took in conducting the Traditional Knowledge study was to gather and review all possible background data including historic accounts, and ethnographic studies. Information included the following primary and secondary sources:

- Albright, Sylvia L. 1984. Tahltan Ethnoarchaeology. Department of Archaeology, Simon Fraser University, Burnaby, B.C.. Publication Number 15.
- Dawson, George. 1887. "Notes of the Indian Tribes of the Yukon District and Adjacent Northern Portion of British Columbia". In: *Annual Report of Geological Survey of Canada*; 1887.
- Emmons, G.T. 1911. The Tahltan Indians. In: *University of Pennsylvania The Museum of Anthropological Publications* Vol. IV, No. 1.
- Gardner, James S. General Environment. In: Handbook of North American Indians, Vol. 6. Subarctic. Gen. Ed.: Sturtevant, W.C.; Volume Ed.: Helm, June. 1981. Smithsonian Institute Washington, D.C. Pp.: 5-14.
- MacLachlan, Bruce. Tahltan. In: Handbook of North American Indians, Vol. 6.
- Unknown. *Subarctic*. Gen. Ed.: Sturtevant, W.C.; Volume Ed.: Helm, June. 1981. Smithsonian Institute Washington, D.C. Pp.: 458-467.
- Tahltan Native Studies. 1970. Stikine School District #87.
- Teit, James. Tahltan Tales. In: *Journal of North American Folklore*. Vol. 34, July-September, 1921. No. 133. New Era Printing; Lancaster PA.

Upon completion of the literature review, the researchers conferred with key Tahltan community leaders to assemble a list of potential Elders who they felt were best suited to participate in and contribute to the study. Recognizing that there are numerous types of knowledge, ecological – and gender-specific, for example, and striving to complete a holistic study, the researchers sought out Elders who offered different yet complementary information. Tahltan Traditional Knowledge study participants included trapline holders, big game outfitters, hunters, prospectors, matriarchs of high-ranking families and researchers from the Tahltan 1983-1985 Land Use and Occupancy Study. Twenty-two Tahltan Elders were earmarked as key contributors – eighteen men and four women. Field research was initiated in the summer of 2005.

The Tahltan Traditional Knowledge research team endeavored to acquire a broad spectrum of information: land use, travel and transportation routes (aquatic and terrestrial); identity, cultural

practices, customs, songs, dances and stories about high-powered animals; location of cultural heritage sites, wildlife trails and fishing spots; weather patterns, including heavy snow and rain fall years; seasonal subsistence rounds and methods for processing foods; and division of labour. Overarching themes and interview questions were developed to help guide the discussions.

6.18.2 Field Research

Field research methods varied depending on the individuals being interviewed and included participant observation, semi-structured and structured interviews and life history methods. The general field plan entailed visiting Tahltan Elders participating in the study at least three times over the course of the summer. The first meeting was to introduce the Tahltan Elder to the NovaGold Galore Creek Project, to approach them about participating in the Tahltan Traditional knowledge study and explain to how Tahltan Traditional Knowledge would be used in the EA. At the end of the first meeting, a mutually agreed upon interview date, location and time was established for the second meeting, which was then held at the predetermined place and time.

The night before the second meeting, the Elder was contacted to discuss which methods they preferred (structured interview, discussion, participant observation). Most of the field research was undertaken during the summer of 2005 and winter 2005/2006. The field research during the summer of 2005 was done when the fish were running. Consequently, many Elders were busy working in summer fishing camps. When this was the case, the researchers assisted in land-based economic activities such as processing fish or harvesting berries, while also engaging the Elder in discussions.

The interviews sometimes involved more individuals than just the Tahltan Traditional Knowledge research team and the participating Elder. At the onset of each discussion, the purpose for the discussion and the use of the Tahltan Traditional Knowledge was explained or reiterated.

Whenever possible, interview sessions were digitally (audio and video) recorded. All interviews, even those held while undertaking land-based activities, were transcribed and provided to the Tahltan Elder for their review and comment. Additionally, whenever possible, Tahltan Elders were asked to create cognitive maps at highlighted areas they viewed to be of importance. Direct personal interviews were conducted in areas around Dease Lake, Telegraph Creek, Tahltan Village and Dawson City, whereas telephone interviews were conducted with Tahltan Elders living in Smithers, Prince Rupert and Terrace.

The third meeting was scheduled much later, once the interview notes had been transcribed. The researchers returned to meet with the Elder and present, review and discuss the Traditional Knowledge transcription. Researchers verified that the written document appropriately reflected the discussion. Permission to use the information as presented in the written format was confirmed.

Traditional Knowledge research often proves to be challenging. The Galore Creek Tahltan Traditional Knowledge studies were no exception. During the summer of 2005, the Nation was confronted by a number of losses – some respected Elders passed away and there were some

suicides. Adding to this was a climate of internal political conflict; many Tahltan Elders were hesitant to participating in the study, expressing a discomfort with the research. Tahltan Traditional Knowledge researchers developed and utilized a tracking document to record their attempts. Of the 22 identified Elders, 10 interviews were completed.

6.18.3 Recent and Current Traditional Knowledge Studies

Additionally, NovaGold completed a number of studies throughout the EA process that involved obtaining insights, views and information from Tahltan community members and Tahltan Elders.

In the winter of 2004-2005, scientists engaged by NovaGold worked with Tahltan trappers, guide outfitters and hunters to acquire information about wildlife use of the Galore Creek and associated valleys. The purpose of the study was to obtain information on the presence/not detected, relative abundance, and observed population trends of consumable wildlife species.

Equally, in November and December 2005, a Tahltan community researcher interviewed 10 Tahltan Elders to determine which country foods are currently collected; the purpose for which the country foods are used (*i.e.*, nutritional, medicinal or both); which part of the country food is used; what quantities of the country foods are used; and how often the country foods are used.

While each of these studies was particularized to a fairly narrow scope and did not discuss socioeconomic components, cultural values or land use and practices, the information acquired from engaging Tahltan community members proved invaluable in determining Tahltan Valued Ecosystem Components (VECs) for the cumulative effects assessment (CEA) of this EA. Tahltan Traditional Knowledge will be used throughout the Galore Creek Project cycle. Some examples of the use of Tahltan Traditional Knowledge in the environmental impact assessment follow.

- NovaGold's decision to select the modified Northern Access Route as opposed to the Southern Access Route was based heavily on information provided by Tahltan Traditional Knowledge. The importance of the Iskut and Stikine rivers; the fish and wildlife habitats; the wetlands; and the vegetation found along the Southern Access Route influenced the final decision to develop the modified Northern Access Route.
- A number of wildlife and aquatic Valued Ecosystem Components (VECs) were identified or confirmed through interviews with Tahltan Elders. Examples include groundhog and martin.
- Water management options, such as timings of discharges from the tailings storage facility, were guided by the needs of aquatic life (*e.g.*, pacing discharges from the storage facility to match natural flow conditions). Traditional Knowledge interviews emphasized the economic importance of fish and the importance of preserving the integrity of aquatic resources.
- Interviews with Tahltan Elders provided information about seasonal rainfalls,
    - specifically, when heavy rains usually occur. This information helped guide water
    - management options for discharges from the tailings storage facility.

- Interviews with Tahltan Elders confirmed the importance of protecting hunting grounds and wildlife stocks in the localized study area. NovaGold is aware of the concern and a road access protocol will be developed jointly between the Tahltan and NovaGold.
- A number of Tahltan Elders spoke to the increased observation of wildlife apparently suffering from neurological impairment (bears for instance). During the wildlife consumptive interviews, Tahltan Elders expressed concern over the toxic impacts that the Galore Creek Project could have on wildlife if the concentrate were to spill into the environment. NovaGold acknowledged these concerns and decided to use a pipeline, as opposed to 40 tonne trucks, to pump the concentrate from the processing plant to Highway 37.
- Traditional Knowledge provided NovaGold with an understanding of traditional land use both in the broad Cassiar Iskut-Stikine region and the local project area. This information was used during numerous baseline studies; for example, heritage sites known to Tahltan Elders were identified and then confirmed during the archaeological assessment.
- NovaGold funded a Tahltan Traditional Knowledge pilot project through the Tahltan Central Council Kime Traditional Knowledge Project, which is housed in Dease Lake at the Tahltan Central Council office.

6.18.3.1 Galore Creek Pilot Project

As part of the Tahtlan Central Council Kime Traditional Knowledge project, NovaGold funded a data and documentation archive project focused in the Galore Creek area. The goal of the Galore Creek Pilot Project was to create a geographic-specific Traditional Knowledge repository and archive for Tahltan Traditional Knowledge based on the Tahltan Historical Land Use and Occupancy Study (1983-1985) and on current research resulting from interviews with members of the Tahltan Nation. All work abided by terms and conditions laid out in a Traditional Knowledge Protocol Agreement between NovaGold and the Tahltan Central Council. The project incorporated a variety of media (electronic, paper, sound recordings, mapping) into an integrated database capable of indexing, multi-keyword searching and ranking by relevance linked to a GIS system. The proposed geographic area would cover the southern half of NTS 1:250,000 Map Sheet 104G and the northern half of NTS 1:250,000 Map Sheet 104B.

Methodology

4. Tahltan Historical Land Use and Occupancy Study:
   - located hard copies of the documents and maps associated with this study, as well as Oral Tradition tapes
   - transported maps to Vancouver for digitization and reproduction
   - prioritized, digitized and transcribed Oral Tradition tapes covering the geographic area
   - located references in text/tapes to sites identified on digitized maps
   - entered these sites into the integrated database.

5. Traditional Knowledge study as part of the Cassiar-Iskut Stikine Land and Resource Management Plan (CIS-LRMP):
   - obtained maps and digital copy of the study from the Integrated Land Management Bureau, Skeena Region
   - digitized data available from this study for incorporation into the database.

This work was supervised by the Manager of the Kime Traditional Knowledge Project. Promotion of the project within the community was also the responsibility of the Manager. This involved newsletters describing the project and the benefits of participating in it as a means of preserving Tahltan Traditional Knowledge as well as use and occupancy in a geographic specific area. This project also followed up and continued with the interviews that had originally begun in spring of 2005.

Results

Over 66 hours of tapes were digitized and transcribed from the Tahltan Historical Land Use and Occupancy Study. Focusing in on this work, over 70 locations identified on the maps were linked to the information contained within the tapes. From this, a map (Figure 6.18-1) showing the study area and corresponding table of information (Table 6.18-1) were created.

The digital copy of the database from the Traditional Knowledge Study associated with the CIS-LRMP could not be migrated to newer technology and was therefore not useable. After the completion of an extensive search, no transcripts or recordings of the original interviews with Elders from this study have been located at the Integrated Land Management Bureau, Skeena Region, or at the former offices of Tahltan Tribal Council.

Table 6.18-1
Map Sheet Sites Identified by Tahltan People from the 1983 to 1986 Study

Map Number	Place	Description
120	Refuge lake (S)	This is an old line cabin called Nine Mile cabin.
122	Durham creek (N)	This creek is called sled or sleigh creek.
123	Devil lake	This lake is called Devil's lake.
124	Lake	From Devil's lake we go to One Mile lake.
125	Raspberry Pass (adjacent)	In Raspberry Pass, we had a hunting base camp.
126	Spectrum range	This is good sheep hunting range south of Raspberry Pass.
128	Mess creek (along)	We bumped into a grizzly near Mess lake one summer.
132	Scud river	Our home cabin was right at Scud Portage.
133	Scud river	Navo creek we call Eaglenest creek. Our first camp was here.
134	Scud river (along)	We trapped both sides of the Scud river right up to Scud glacier.
135	Saddle Mtn (NW)	I also trapped up this tributary of Scud river.
136	Scud river	We had a trapping camp on an island in the middle of the Scud. Snow slides are so bad in there that you have to camp in the middle of the valley.
138	Skud river	In the fall, there is thousands of coho in the Scud. You can get them right till freeze up. Some trout too. Grizzlies feed along here right into December.

(continued)

Table 6.18-1
Map Sheet Sites Identified by Tahltan People from the 1983 to 1986 Study (continued)

Map Number	Place	Description
139	Scud river (along)	I had to shoot one grizzly at the cabin here. He was into the fish.
140	Klottchmen Mtn (below)	Trapping cabin here.
141	Scud river (mouth)	Just below Patmore creek another trapping cabin.
142	Cone Mtn (below)	Cabin here was called the cut-off cabin.
143	Little Canyon (upper)	Just above Little Canyon he had another little cabin.
144	Stikine river (along)	Trapping from Klootchman Canyon to Beaver Point.
147	Wiggle creek (W)	Trapping on the north side of the Chutine (Clearwater).
148	Porcupine river (on)	Trapping on the Porcupine.
160	Taweh	There is a hunting camp at the head of Big Sheep creek.
161	Buckinghorse creek (E)	Taweh creek is known as Sheep creek.
216	Klootchman Canyon (above)	The Stikine river is pronounced _____ (115) meaning “that the water is so rough it’s like its boiling or fighting and biting”.
227	Raspberry Pass (N)	From 10 mile, an old Tahltan trail goes up Mess creek and over to Kinaskan.
263	Night Out Mtn (top)	There is another campsite here.
264	Yehiniko lake	Yehiniko lake is called _____ (155) meaning “Glacier lake”. That’s as far as I been down this way.
265	Yehiniko creek N (end)	At the outlet of Yehiniko lake there is a hunter’s camp.
266	Yehiniko creek (near)	I know Yehiniko creek as Glacier creek.
267	Yehiniko creek (near)	There is a sheep lick here.
268	Taweh	Where Taweh creek crosses the Telegraph line there is a cabin.
269	Raspberry Pass (N)	On Raspberry creek at the line, there is a cabin.
270	Raspberry Pass (adjacent)	In Raspberry Pass near timberline, there is another cabin.
276	Little Iskut river (along)	This creek is known as Little Iskut river.
277	Spectrum range (E)	This mountain is called _____ (422) because when the people in the south can’t get game, they rush to this mountain to get goats.
278	Refuge lake (around)	There is a cabin at the outlet of Refuge lake.
279	Refuge lake	Refuge lake has always been called that.
280	Chutine river (mouth)	The boundary follows the Stikine up from the Iskut to the mouth of the Clearwater (Chutine) then up the Clearwater.
291	Beginning of trail (Chutine river)	There is a village site here near the mouth of Clearwater. They fish here.
292	Ugly creek (E)	Twenty miles up the Clearwater, shown as Chutine on the map, there is a village and fish site.
293	Pendant creek (mouth)	The Chutine river is called _____ (897). It is locally known as Clearwater.
300	Raspberry Pass	Around Raspberry Pass, we hunted goat, sheep, moose, caribou and bear.

(continued)

Table 6.18-1
Map Sheet Sites Identified by Tahltan People from the 1983 to 1986 Study (completed)

Map Number	Place	Description
310	Mink creek or Spatsizi river NE	Guiding from Glenora to Chutine for grizzly hunters.
322	Wiggle creek (E)	From Telegraph to Clear water is a preferred hunting area year round.
328	Mess creek	Sheep come off Stingy mountain right down to the canyons of Mess creek.
330	Raspberry creek	There is a great big lick in this basin used by everything.
331	Night Out Mtn (top)	This is a horse trail from Ball's ranch.
377	Spectrum range lake (on top)	We had a hunting camp on this lake last fall.
388	Dokdoan	Dokdoan creek means "there is an echo". (Bobby Quock (45), tape 21a-B, Feb 21, 1983).
389	Devil Elbow Mtn (below)	On Devils Elbow mountain there are boulders set in circles about 10 feet in diameter. We found arrow heads inside.
391	Saddle Mtn	Above Anuk river, there is an also a stone fort with arrowheads.
392	Alpha Mtn	There is a square rock fort here on Alpha mountain.
393	Telegraph Creek trail	We had a trapping base camp on Devils creek.
394	Refuge lake (S)	We cross Burrage creek here on the trapping route.
395	Refuge lake (S)	The cabin here is known as the Nine Mile cabin and also as the White House.
396	Durham creek (S)	This is our trapping route to Devils creek after it leaves the line trail.
398	Porcupine river (mouth)	Trapping around the Porcupine river.
399	Scud river (mouth)	Trapping about 20 miles up the Scud. Our main cabin was at the mouth of the Scud.
407	Schaft creek	Shaft creek is called _____ (097)
469	Yehiniko creek (near)	This hunting and trapping trail leads to Glacier lake from the Stikine river.
470	Yehiniko creek (near)	There is a campsite on the trail, three miles from the Stikine river.
471	Yehiniko creek (near)	We camped four miles below Glacier lake.
478	Refuge lake (S)	There is a campsite at Durham creek.
479	Refuge lake (S)	Durham creek is called _____ (802).
480	Refuge lake (S)	There is a camp site at Devil creek.
481	Refuge lake (S)	There is a camp site near Mule lake.
482	Vourgeaux creek	Bourgeaux creek is called _____ (819)
484	Taweh	Just above the line trail, we camped at a trapper's camp.
486	Mess Creek	This lake on Mess creek is called _____ (104)
487	Mess creek (along)	This creek is called _____ (108) meaning ice water creek.
488	Mouez creek	Ambition mountain, Mt. Hickman, Saddlehorn mountain are all called by one name which is _____ (135).
489	Iskut river	The Iskut river is called _____ (169).
509	Refuge lake (S)	Devil creek is called that because it's so hard to cross with horses.
510	Refuge lake (S)	There used to be a line cabin near the camp site at Pup lake.
521	Refuge lake (around)	There is a campground at Refuge lake.