

SQUAMISH NATION

ABORIGINAL INTERESTS AND USE STUDY



**AN ASSESSMENT OF THE IMPACTS OF THE PROPOSED
SEA-to-SKY HIGHWAY UPGRADE PROJECT
ON THE SQUAMISH NATION**

CONFIDENTIAL

Prepared by the Squamish Nation

for

The BC Ministry of Transportation
July 15, 2003

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

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SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

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SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Acknowledgments	i
Summary.....	1
1.0 Study Background.....	10
1.1 Purpose.....	10
1.2 Approach, Methods, Definitions.....	11
1.3 Sea to Sky Highway Upgrade Project Description.....	12
2.0 The Squamish Nation.....	12
2.1 Aboriginal Rights and Title – Summary of Legal Information	12
2.2 Squamish Nation Rights and Title Summary.....	16
2.3 Archaeological and Ethnographic Information.....	17
2.4 Activity Site Lists	30
2.5 Duty to Consult and Accommodate – Summary of Legal Information.....	43
2.6 Negotiating for Mitigation and Accommodation – Summary of Legal Information.....	44
3.0 A Brief History of Development in the Study Area	47
4.0 Squamish Nation Socio-economic Profile	51
4.1 Community Profile.....	51
4.2 Social Profile.....	54
5.0 Archaeological and Heritage Site Impacts.....	57
6.0 Nation Impacts	63
6.1 Social and Economic Inequalities	63
6.2 Disruption of Significant Sites and Areas.....	67
7.0 Land Impacts.....	74
7.1 Land Availability and Value	74
7.2 Direct Loss or Isolation of Land	78
7.3 Direct Loss of Resources	80
8.0 Community Impacts.....	86
8.1 Quality of Life – Construction Phase.....	86
8.2 Quality of Life – Operations Phase.....	91
9.0 Cumulative Effects.....	96
9.1 Cultural Interference	96

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Appendices	102
Appendix A. GIS Methodology for Land Usability Analysis	102
Appendix B. Squamish Nation Land Demand Analysis.....	104
Appendix C. Non-native Land Demand Analysis	107
References	109

List of Maps

Map1. AIUS Study Area.....	4
Map 2. Preliminary Alignment of the Sea to Sky Highway Upgrade Project	15
Map 3. Recorded Archaeological Sites.....	20
Map 4. General Constraints on Squamish Nation Use of the Study Area	52
Map 5. Usability and Slope of Land within 5 Kilometres of the Sea to Sky Highway	75

List of Tables

Table 1. Existing Squamish Nation Reserves	51
Table 2. Squamish Nation Total Membership, 2002	54
Table 3. Age Group Profile.....	55
Table 4. Horseshoe Bay to Squamish: Areas of Archaeological Investigation and Results.....	60
Table 5. Squamish to Whistler: Areas of Archaeological Investigation and Results	61
Table 6. Summary of Protected Archaeological Site Information.....	61
Table 7. Summary of Post-1846 Heritage Site Information	62
Table 8. Estimated Government Revenue – Construction Phase	65
Table 9. Estimated Government Revenue – Operations Phase.....	65
Table 10. Development Potential of Land in Proximity to Highway 99	76
Table 11. Estimated Value of Land Required by Squamish Nation for Housing.....	78
Table 12. Selected Plants of Interest in the Highway Corridor	82
Table 13. Value and Quantity of Imported Fresh and Chilled Mushrooms to Japan	83
Table 14. Selected BC Indigenous Medicinal Plants for Wildcrafting and Sales	84
Table 15. Market Prices: Timber	85
Table 16. Estimated Equipment Emissions during Construction	89
Table 17. Sources and Estimates of Dust during Construction	89
Table 18. Traffic Volume, Daily Trips	91
Table 19. Non-motorized Traffic on the Sea to Sky Highway through IR No. 24.....	92
Table 20. Existing Noise Levels on IR No. 24	93
Table 21. 1995 Emissions in the Sea to Sky Highway Airshed.....	94

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

SUMMARY

Project Background. The BC Ministry of Transportation (MoT) is proposing to make a number of upgrades to the Sea to Sky Highway between Horseshoe Bay and Function Junction, in order to improve safety. Detailed descriptions and maps of the proposed upgrades can be found on the BC Environmental Assessment Office website:

http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_project_doc_list_192_p_abc.html

MoT and the Squamish Nation have agreed to the preparation of an Aboriginal Interests and Use Study (AIUS) that looks at all past, present, and future interests and uses of the Squamish Nation territory that may be impacted by the proposed upgrades. Map 1 shows the study area.

The AIUS is a Squamish Nation study based on information provided by Squamish Nation members. Through a series of interviews, meetings and workshops, impact topics were determined by a focus group of Squamish Nation elders and other key community members.

Project specialists were also retained by the Squamish Nation and each specialist provided a report for submission solely to Squamish Nation. In some cases information from the specialists' reports has been summarized, but in many cases, information presented in the AIUS has been taken directly from the specialists' reports. Mitigation recommendations have been developed by the Focus Group, project specialists, Squamish Nation Chiefs and Council, and community members through a series of reviews, presentations, and community meetings.

It was proven difficult to separate the effects of increasing development and traffic that will occur without the upgrades, and the incremental effects of the upgrade project itself. It is clear that Squamish members understand the effects of the upgrade project may be incremental, but consider them to be extensions of existing highway impacts with high cumulative effects. In this study, impact descriptions may include consideration of existing and continuing impacts of the highway as well as the incremental effects of the upgrade project.

Aboriginal Rights and Title. Section 35 of the *Constitution Act, 1982* gives constitutional protection to the “existing aboriginal and treaty rights of the aboriginal peoples of Canada.” Aboriginal rights that have not been extinguished prior to 1982 are recognized by the common law and are enforceable by the courts. There are a number of sources of evidence which can be brought to prove aboriginal rights and title: oral histories, historical documents, archaeological and anthropological studies, linguistic analysis, geographic information which includes the place names from aboriginal nations, and expert opinions. Through extensive interviews with Squamish Nation members over the past thirty years, ethnographic work conducted on behalf of the Squamish Nation provides substantial details on the occupation and use of the study area.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Consultation with First Nations and accommodation of First Nations' interests is required to avoid a breach of the fiduciary duty owed by the Crown to aboriginal peoples and to justify any infringement on aboriginal title and/or rights. It is also the law that, to be meaningful or genuine, consultation and accommodation must occur early in the planning stages of the project and not after any decisions have been essentially made. Consultation and accommodation must take place before an infringement of aboriginal rights or title occurs, if it is to form part of the justification for the infringement. There must be a genuine intent to integrate First Nations' concerns with any proposal demonstrated. As well, the duty to consult, like the fiduciary duty of which it is an example, is a continuing duty.

Impacts on Squamish Nation Interests and Use. Identified impacts and mitigation opportunities are:

Archaeological and Heritage Sites. No archaeological sites were identified as being in direct conflict with the proposed project impacts. Two archaeological sites were identified in proximity to the proposed project corridor, but at this time, it is expected that only indirect impacts might occur. Four heritage sites with culturally modified trees have been identified that may be cleared during construction. Tree ring counts of increment bore cores taken from a sample of the trees have indicated that none of them pre-date 1846. While these sites are not automatically protected under the *Heritage Conservation Act*, they should be considered as traditional use sites. Mitigation opportunities include:

- Retain a Squamish Nation archaeologist to monitor construction activities and provide direction when archaeological and heritage sites are impacted.
- Avoid clearing of cedar groves as these trees are particularly valuable to Squamish members, where cedar groves cannot be avoided, locate and protect alternate cedar groves for Squamish Nation use.
- Prior to disturbance of culturally modified trees, allow Squamish members to harvest valuable materials

Social and Economic Inequalities. Squamish Nation members believe that there is a considerable income disparity and social marginalization between Squamish Nation members and the non-aboriginal community, and that this will continue. As land values continue to rise and more people are attracted to the Sea to Sky Corridor area due to the presence of the existing highway and the proposed upgrades, closing the income gap will become a more significant challenge for the Squamish Nation people. Fiscal inequalities also exist, in that the Squamish Nation does not benefit from local development in the same way that other governments benefit.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Squamish Nation has a strong interest and a right in sharing the revenues that are generated on Xay Temixw (Squamish Nation traditional territory). Mitigation opportunities include:

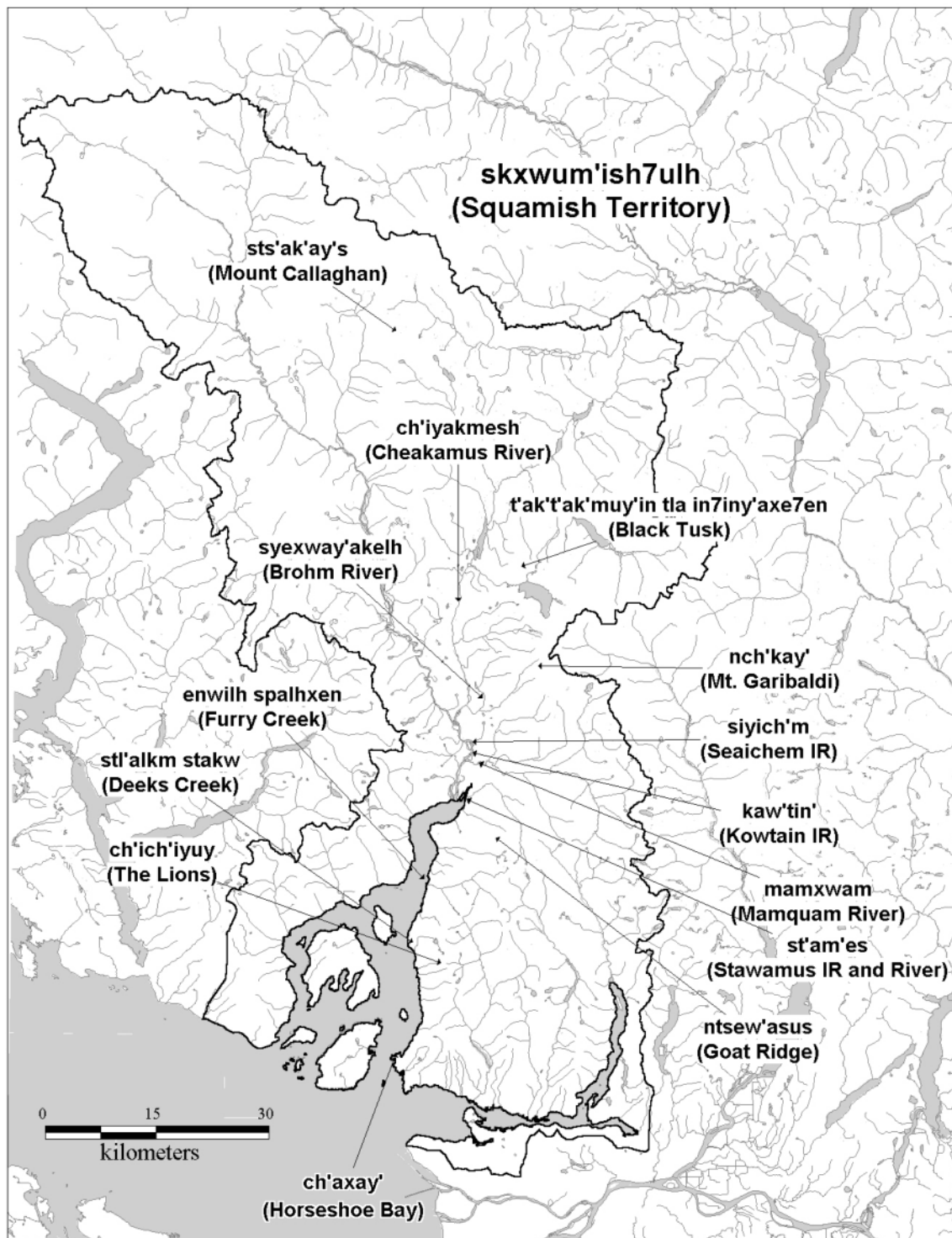
- Training and employment of Squamish Nation members for highway construction and maintenance.
- Long term contracts performing highway maintenance
- Provision of direct and safe highway access to commercially developable land on Squamish Nation reserves
- Establish revenue sharing agreements among Squamish Nation and other governments

Disruption of Significant Sites and Areas. The Sea to Sky Highway currently “runs up the backbone” of Squamish Nation territory, and many significant sites and areas have already sustained a high level of impact from the existing highway and associated induced impacts (such as increased development and tourism). The proposed highway upgrades will add to those impacts. Each of the important sites and areas may be impacted differently by the proposed upgrades - the usefulness of some sites may be diminished, others may be compromised enough that Squamish Nation members will no longer use them, or overcrowding by non-native recreationists may drive game away or decrease privacy at spiritual sites. Mitigation opportunities include:

- Protection of sites and areas through land acquisition or access management:
 - Pictographs at Sunset Marina
 - Deeks Creek ritual bathing site
 - Furry Creek ritual bathing site
 - Pictographs near Furry Creek
 - Brohm Creek ritual bathing site
 - Swift Creek ritual bathing site
 - Stawamus Creek River ritual bathing site
- Ensure Squamish Nation members are included in the development of access management plans:
 - Hunting area in the hills east of the highway between Lions Bay and Loggers Creek
 - Trails near Deeks Creek (Andrew Natrall’s trail)
 - Deer hunting areas between Kallahne Creek and Furry Creek
 - Hunting areas between Brohm Lake and Cheakamus Canyon
 - Trapping areas between Murrin Park and South Stawamus

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Map 1. Squamish AIUS Study Area



(Note: Note that exact transcriptions of Squamish language are not possible due to software limitations in available fonts. In many cases throughout this report, correct positions of apostrophes and underlining are not included. Correct representations of all Squamish language words can be obtained directly from the Squamish Nation.)

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Ensure Squamish Nation members are included in the development of habitat mitigation strategies to ensure protection of fishing and hunting activities:
 - Stawamus River
 - Mamquam River
 - Mamquam Blind Channel
 - Brohm River (steelheads)
 - Important game habitat areas
- Acquisition or co-management of provincial parks:
 - Porteau Cove
 - Alice Lake
 - Brohm Lake
 - Murrin Lake
 - Shannon Falls
 - Brandywine
- Protect through land acquisition or access management, and protect from contamination by weed control activities:
 - Pine mushroom picking areas (between Cheakamus Canyon and North Garibaldi, northwest side of Daisy Lake)
 - Berry picking areas along the highway between North Garibaldi and Brandywine
- Special Sites:
 - George family memorial at M Creek – if the site is disturbed, a permanent marker should be constructed, with the family's input
 - Land in the Porteau Cove area – land stability assessments should be conducted to ensure construction does not impact the safety of land downslope

Decreased Land Availability and Associated Increased Cost of Land. The Squamish Nation's interest in acquiring land in the territory will occur in the face of increasing competition for land from non-native populations. As land is taken up by non-native populations, fewer areas of suitable land will be available for residential development or for satisfying agreements already reached by the Squamish Nation and other governments and industry. The cost of land is expected to rise with demand, and the increasing cost of land will reduce the amount of land the Squamish Nation can purchase in their territory once a treaty is reached (in potentially 5 to 10 years). Mitigation opportunities include:

- Provision of land for community development

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Institute a freeze on Crown Land privatization and tenure until Squamish Nation needs are met

Direct Loss of Land and Isolation of Land. New right-of-way for the upgraded highway will be required on IR No. 24 (Stawamus). Given the Nation's limited land base at Stawamus, the requirement for any additional land on IR No. 24 for highway upgrades could severely limit the economic development potential on reserve. In addition, the existing highway is not entirely contained within existing right-of-way and therefore constitutes an encroachment on the reserve.

There will also be increased impacts on the usability of reserve land. The existing highway, consisting of 2 lanes through IR No. 24, currently isolates portions of the reserve, particularly the 2-hectare site north of Valley Drive. Commercial development of this site requires safe and convenient vehicle access directly from the highway or from Valley Drive.

Opportunities for mitigation include:

- Provision of an alternate development site along the Sea to Sky Highway for economic development
- A legal surveyor should be retained to conduct a title search of documentation of right-of-ways that impact IR No. 24.
- A legal plan be prepared that defines the locations of the existing right-of-ways on IR No. 24.
- The right-of-ways be posted in the field and the amount of the road encroachment onto IR No. 24 land be determined.
- Compensation for the existing encroachment.

Direct Loss of Resources. Removal of resources for additional right of way and clearing resulting from the proposed upgrades will impact aboriginal use of and title to those resources. Areas cleared for highway upgrades will include plant species of importance to First Nations for food (i.e. berry picking), materials used in making implements and ceremonial items, and for medicinal purposes. Other key resources that will be removed for the highway upgrades include merchantable timber and rock. Mitigation opportunities include:

- Provide access to timber to be removed and/or employment in logging operations
- Provide access to the plants to be removed during clearing and grubbing
- Provide access to rock removed for development on First Nations lands, including rock required for dyke improvements and other flood proofing measures

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Provide financial compensation for loss of resources

Reduced Quality of Life – Construction Phase. Quality of life will be affected for communities of the Squamish Nation in the highway corridor by construction related delays, increased traffic hazards in construction zones, increased noise levels, and decreased air quality. Mitigation opportunities include:

- Conduct construction stage road safety audits throughout the construction phase of the highway upgrades.
- For the course of construction, a Squamish Nation member should be designated as a “Traffic Management Coordinator” to liaise, and facilitate all communications between the Nation and the MoT and their contractors. It is recommended this be a full-time paid position and be initiated as soon as construction is imminent.
- Concentrate the noisiest activities during daytime construction periods to reduce the associated noise impacts and update the noise report to reflect actual data and detour information as it becomes available.
- Reduce hauling of excavated and fill material; water and cover exposed soil to reduce dust. MoT should commit to diligently following these and other dust and emission control recommendations.
- Conduct air quality monitoring on the Stawamus Reserve during construction. If high levels of air pollution are identified, then remedial measures should be instituted or other mitigation measures discussed with representatives of the Squamish Nation.

Reduced Quality of Life – Operation Phase. Once construction is complete, increased traffic as a result of the highway upgrades will decrease road safety at highway intersections and on other roads in and around the Squamish Nation, increase noise, and reduce air quality. Mitigation opportunities include:

- A transition from the higher speed highway to an urban thoroughfare section should occur south of I.R. No 24, providing adequate facilities for motorized and non-motorized (e.g. pedestrians) users. The urban cross section should contain travel lanes, turning lanes (as required), bicycle lanes and sidewalks on both sides separated from the Sea to Sky Highway traffic by a boulevard strip.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Prior to detailed design, the MoT should consult with Squamish Nation regarding proposed road/access changes along the corridor potentially impacting access to traditional territories
- Noise mitigation measures should be examined to reduce the future predicted noise levels to the CMHC residential impact threshold of 55 dBA. The current MoT application of the 1993 “Revised Policy for Mitigating Effects of traffic Noise from Freeways and Expressways” to I.R. No. 24 appears to be inappropriate as the proposed upgrades of the Sea to Sky Highway at I.R. No. 24 is neither an expressway nor a freeway.
- MoT should conduct air quality monitoring before construction of the highway upgrades and periodically thereafter to determine the level of air emissions change associated with the signal operation and with increasing traffic volumes. The resulting information would allow the Squamish Nation and MoT to determine whether mitigation is needed, and if so, the kind and level of mitigation.

Cumulative Effects - Cultural Interference. Those interviewed commonly expressed a sense of being overwhelmed by increasing numbers of non-aboriginal people coming into the Squamish Valley. Squamish Nation members perceive the result of this influx to be diminishment of a Squamish Nation presence. Squamish Nation people regard escalating non-native development as a reflection of the government’s indifference to the existence of Squamish Nation aboriginal title, for British Columbia is seen to be facilitating other citizens’ interests in Squamish Nation traditional lands and resources, to the detriment of the Squamish Nation. The proposed upgrading of the Sea to Sky Highway is seen as yet one more assault on aboriginal title, which is the Squamish Nation people’s primary concern.

Squamish Nation people are particularly concerned that areas of wilderness will not be available to future generations. Continuation of Squamish Nation religious practices requires on-going access to wilderness — remote areas devoid of other humans — but such areas are becoming harder to find. Squamish Nation people view their continuing access to wild foods as an essential element of being aboriginal, despite the history of encroachment throughout their territory that has displaced many traditional activities. Squamish Nation people regard the right to hunt and trap, and the opportunity to do so, as being fundamental to maintaining a distinct aboriginal Squamish Nation identity.

The cumulative environmental degradation resulting from increased development in Squamish Nation traditional territory is a great concern to Squamish Nation members, who have reported

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

numerous environmental abuses and broken promises that accompanied the current rail and highway corridors. Around Stawamus I.R. 24, “Indian Lake,” once a water supply, was filled with rock, and a spawning channel of the Stawamus River disappeared, both as a result of rail and highway construction. Fewer people fish today for salmon in the Stawamus River, due to decrease in the runs. Berries once picked alongside the easements are no longer available due to pesticide use on the right-of-ways, and more ubiquitous grime.

The cumulative impact of the loss of lands and resources has led directly to a reduction in the Squamish Nation people’s practice of traditional pursuits, and also in their ability to exercise these activities in the future. Places once visited for harvesting sustenance and material resources, or for finding spiritual assistance, are now the sites of housing developments, parks and ski-lifts, all linked by roads. Squamish Nation people anticipate that the impact of further highway construction will be yet another erosion of their aboriginal rights and title, as non-aboriginals penetrate deeper and more intensely into the Squamish Nation wilderness, pushing the Squamish Nation into quickly-disappearing enclaves.

Mitigation opportunities include:

- Consultation with Squamish Nation regarding proposed road/access changes along the corridor within traditional land territories prior to construction.
- Access controls and management plans that aid in preserving backcountry areas as well as culturally important sites and areas should be developed with Squamish Nation input. The effects of increasing recreational access and preserving culturally significant area must be reconciled.
- Protection of special sites through acquisition of land.
- Publicly-distributed maps and highway signs that promote the use of indigenous place names, as well as local names throughout Squamish Nation territory, as a way of increasing awareness of the Squamish Nation culture.
- The development of a Squamish Nation interpretive centre could also increase the visibility of the Squamish Nation in the territory.

1.0 Study Background

1.1 Purpose

The BC Ministry of Transportation (MoT) is proposing to make a number of upgrades to the Sea to Sky Highway between Horseshoe Bay and Function Junction, in order to improve safety. The proposed improvements will also accommodate increased traffic attributable to the Vancouver Whistler 2010 Olympics. MoT must apply for a project certificate from the BC Environmental Assessment Office (EAO) before any construction can begin. Typically, the province requires an Archaeological Impact Assessment (AIA) before approving the proposed highway upgrades, but an AIA looks only at archaeological sites, and not at any other impacts that might occur. In order to ensure that all of the impacts are identified and assessed, MoT and the Squamish Nation have agreed to the preparation of an Aboriginal Interests and Use Study (AIUS) that looks at all past, present, and future interests and uses.

Squamish Nation has prepared this AIUS for their traditional territory. The purpose of the AIUS is to identify all impacts on aboriginal title and rights from the proposed highway upgrades, and to recommend mitigation or compensation for impacts that cannot be avoided.

The Squamish Nation has provided their extensive expertise and knowledge of the study area as means of establishing interests and use, identifying impacts, assessing the level of impact, and developing mitigation recommendations. Squamish Nation also retained a number of specialists to provide technical studies, including a Planner, Economist, Transportation Planner, Ethnographers, and Archaeologist.

Squamish and Lil'wat Nations have cooperated in data collection and other project activities where traditional territories are shared, and Lil'wat Nation is preparing a separate AIUS.

1.2 Approach

The AIUS is a Squamish Nation study based primarily on information provided by Squamish members. Through a series of interviews, meetings and workshops, impact topics were determined by a focus group of Squamish elders and other key members. Interview participants are listed in the Acknowledgements. The Squamish Nation Focus Group was comprised of the following individuals:

- Chief Ronald Newman, Elder
- George Jacob Sr., Elder
- Alex Williams, Elder
- Robert D. Baker, Elder
- Gwen M. Harry, Elder
- Dale Harry, Councillor
- Donna Billy, Councillor
- Carla George, Aboriginal Secretariat, Vancouver Olympic Bid 2010

Project specialists and Squamish members worked together to address each of the impact topics identified in the issue-scoping phase through data collection and analyses designed to illustrate the impacts as they were expressed. Each specialist provided a report for submission solely to Squamish Nation; these reports have been used to develop the AIUS. In some cases information from the specialists' reports has been summarized, but in many cases, information presented in the AIUS has been taken directly from the specialists' reports. These excerpts have not been explicitly referenced in the AIUS, but are acknowledged here:

Ethnographic Report:	Dorothy Kennedy and Randy Bouchard, Bouchard & Kennedy Research Consultants
Community Planning Report:	Kathleen Callow, UMA Engineering
Transportation Planning Report:	Mark Mertz, UMA Engineering
Archaeology Report:	Rudy Reimer (archaeologist), Kevin Rivers (field crew)
Economic Report:	Jason Calla, Fiscal Realities
Legal Report:	Greg McDade and Lesley Giroday, Ratcliff and Company

Project coordination and management was provided by Eleanor Setton of Westland Resource Group, who also prepared the draft AIUS report with input from the Squamish Nation, their legal counsel, and their ethnographic consultants. The final AIUS report has been prepared by the Squamish Nation.

Mitigation opportunities have been developed by the Focus Group, project specialists, Squamish Nation Chiefs and Councils, and community members through a series of reviews, presentations, and community meetings.

Cumulative effects are considered for the impacts of proposed upgrades only. The interactions between inmitigable residual effects of the highway upgrades on the Squamish Nation and residual effects of other projects in the study have not been assessed. It has proven difficult to separate the effects of increasing development and traffic that will occur without the upgrades, and the incremental effects of the upgrade project itself. It is clear that Squamish Nation members understand the effects of the upgrade project may be incremental, but consider them to be extensions of existing highway impacts with profound and far-reaching cumulative effects. In some parts of this study, impact descriptions may include consideration of existing and continuing impacts of the highway as well as the incremental effects of the upgrade project.

1.3 Sea to Sky Highway Upgrade Project Description

The BC Ministry of Transportation has provided a general description of the proposed upgrades to the Sea to Sky Highway, available at the BC Environmental Assessment Office website: http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_project_doc_list_192_p_abc.html Upgrades are planned to start just south of Horseshoe Bay and continue to Function Junction, just south of Whistler. For descriptive purposes, the route has been divided into ‘preliminary alignment’ sections (PA1 through PA16) as shown on Map 2.

2.0 The Squamish Nation

2.1 Aboriginal Rights and Title – Summary of Legal Information

Section 35 of the *Constitution Act, 1982* gives constitutional protection to the “existing aboriginal and treaty rights of the aboriginal peoples of Canada.” Aboriginal rights that have not been extinguished prior to 1982 are recognized by the common law and are enforceable by the courts.

Aboriginal Rights. Canadian case law has established that the test for determining whether a right can be established as an aboriginal right that is protected by s. 35(1) requires that the activity so claimed must be an element of a practice, custom or tradition integral to the distinct

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

culture of the aboriginal group claiming that right. The test requires the aboriginal person or group claiming the right to:

- identify the right that is claimed;
- demonstrate that the activity claimed to be an aboriginal right was an aspect of a custom, practice or tradition that was integral to the distinctive aboriginal culture prior to the time of contact with Europeans; and
- demonstrate that the custom, practice or activity continues to be integral to the distinctive aboriginal culture today.

The evidence required to establish that an aboriginal right exists as claimed will vary depending on the aboriginal right asserted and on a case-by-case fact-specific basis.

The activity claimed as a right must be shown to have been integral to the distinct culture before contact. That is to say, it must be of central significance to the distinct aboriginal culture. These activities declared as rights must be so important to the First Nation culture that the activity was one of the things that made the society what it was.

There must also be continuity between the pre-contact activity that was integral to the distinctive aboriginal society and the present day activity that is claimed as the aboriginal right. The activity must still be integral to the distinctive aboriginal culture. While there does not need to be an unbroken chain of continuity through time, some connection demonstrated between the present day activity and the pre-contact activity need be shown. The present day activity need not precisely mirror the pre-contact activity. Aboriginal rights are to be interpreted flexibly so as to permit their evolution over time. Such rights are not to be cemented in their pre-contact form such as to frustrate their modern exercise.

Aboriginal Title. When aboriginal title is asserted, the aboriginal group asserting title must prove the following:

- that the land was occupied prior to sovereignty;
- that if present occupation is relied on as proof of occupation pre-sovereignty that there is a continuity between present and pre-sovereignty occupation; and
- that sovereignty occupation was exclusive.

The land claimed as title land must be integral to the distinctive culture of the aboriginal group claiming that title. However, the group showing that it exclusively occupied the land prior to sovereignty can demonstrate this integral connection between the land and the group asserting the claim. The source of aboriginal title is grounded both in the common law and in the aboriginal perspective on land. Both perspectives need to be considered in determining if an

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

aboriginal group has proven the exclusive use and occupation of the land sufficient to prove aboriginal title.

Aboriginal systems of traditional laws affecting the land would be evidence of the aboriginal perspective on the occupation of the land. Physical occupation is sufficient to prove title to land from the perspective of the common law. This is because physical occupation is proof of possession at common law. However, physical occupation does not necessarily mean actual physical presence on the land on a permanent basis.

While there must be continuity between pre-sovereignty occupation and present occupation, a group claiming title is not required to prove an unbroken chain of continuity. Courts recognize that it would be very difficult to prove occupation at the time of sovereignty since it happened such a long time ago and that there have likely been disruptions in the occupation of aboriginal peoples to their lands between sovereignty and the present day. A substantial maintenance of the connection must be demonstrated.

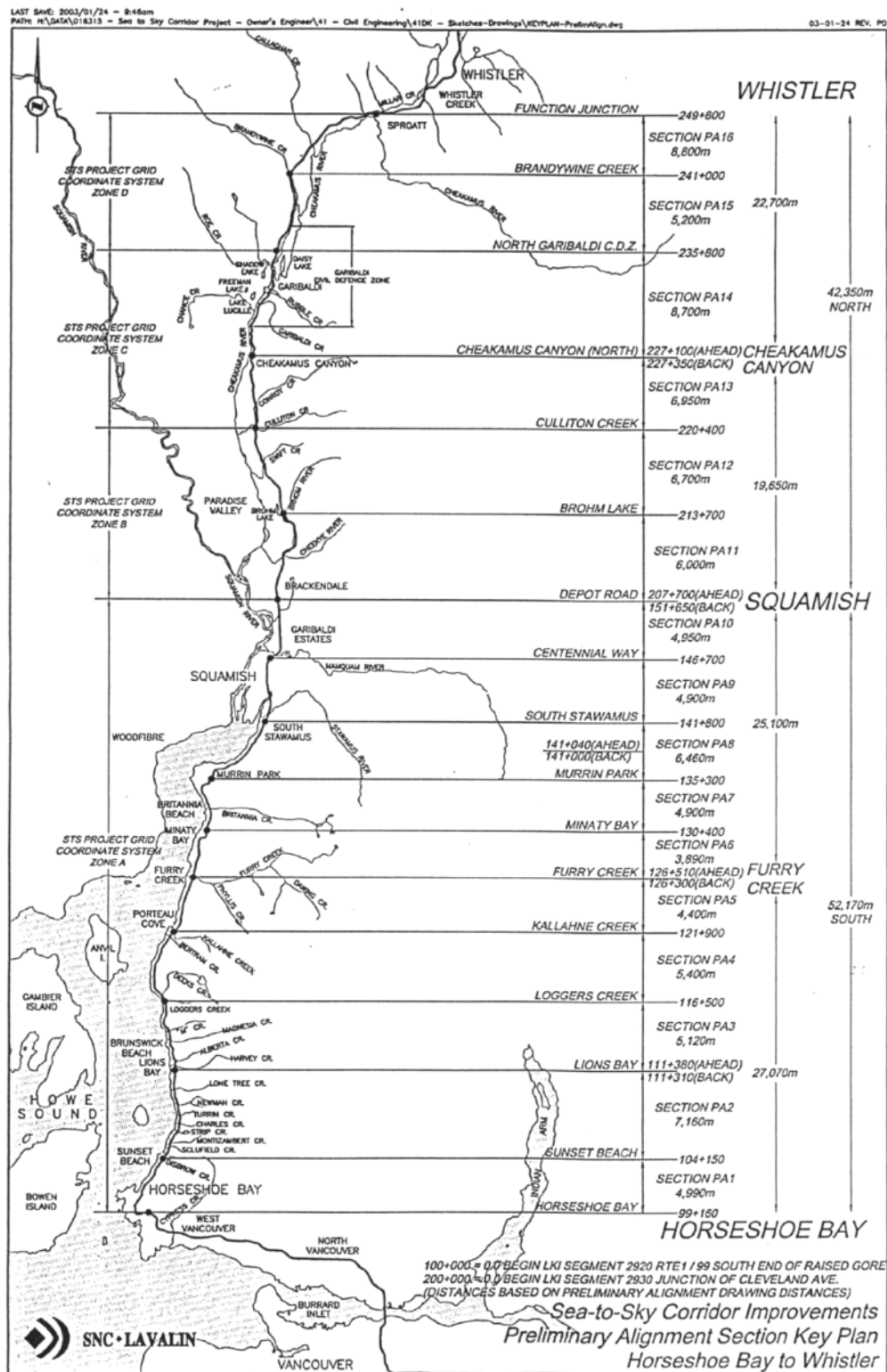
Exclusivity of the use and occupation of the land can be established through both the perspectives of the common law and the aboriginal perspective. This exclusivity need not be demonstrated by the complete lack of other aboriginal groups who were present or frequented the claimed lands. However, that exclusivity would be demonstrated by an intention and capacity to exert exclusive control. In fact, the use and presence of other aboriginal groups might reinforce the finding of exclusivity where those groups had to request access to the lands and where permission was given. Shared exclusive possession is recognized at common law such that two aboriginal nations may have lived on a particular piece of land and recognized each other's entitlement to the land.

The existence of a customary aboriginal law system existing at the time of sovereignty governing land use would be evidence going to prove aboriginal title. Physical occupation on the land including construction of dwellings, cultivation, enclosure of fields, and the regular use of definitive tracts of land for hunting, fishing or otherwise using the land's resources would also be evidence towards a title claim. Further, an intention and an exercise capacity to retain exclusive control of the land would also demonstrate a title interest.

There are a number of sources of evidence which can be brought to prove aboriginal rights and title: oral histories, historical documents, archaeological and anthropological studies, linguistic analysis, geographic information which includes the place names from aboriginal nations, and expert opinions.

SQUAMISH NATION ABORIGINAL INTERESTS AND USE STUDY BC MINISTRY OF TRANSPORTATION - SEA TO SKY HIGHWAY UPGRADE PROJECT

MAP 2. Preliminary Alignment of the Sea to Sky Highway Upgrades



Source: SNC Lavalin

2.2 Squamish Nation Rights and Title Summary

The Squamish Nation has used since time immemorial, and continues to use, the lands and resources within their traditional territory. They have an undeniable claim to aboriginal title throughout their traditional territory. The forbearers of the current Squamish Nation people lived and moved throughout this territory in pursuit of the resources that supported them. The variation in resource availability over the seasons dictated yearly movements between winter villages in the Squamish and Cheakamus River valleys and summer harvesting camps in Howe Sound and Burrard Inlet. The number and variety of sites utilized by Squamish Nation people throughout their territory for sustenance and material resources, trade and ceremonial practices is substantial and is documented in the site charts and maps produced herein.

The early historical records of the Hudson's Bay Company puts the Squamish Nation as a recognized distinct aboriginal group in the Burrard Inlet/Howe Sound area as early as 1827, well before the recognized date for the declaration of sovereignty in British Columbia. Given movement patterns dictated by resource availability, Squamish Nation people would certainly have also been extensively using the northern part of their territory at that time as well. The archeological record supports this, with the presence of sites (villages, campsites, middens, culturally modified trees, etc.) throughout the territory, some dating back as far as 8,000 to 10,000 years ago, based on the dating of artifacts. For example, there is a lithic scatter site on Brohm Ridge with artifacts dating back 8,000 years. The oral record of the Squamish Nation further buttresses this, with stories told of ancient events that place the Squamish Nation in the Squamish and Cheakamus River valleys thousands of years ago – e.g., at the time of the Great Flood when the Squamish Nation people rescued themselves by getting in a large canoe which was tied to Mt. Garibaldi (Nch'kay'). Squamish Nation place names for lakes, mountains, rivers and other landscape features abound, providing further evidence of the Squamish Nation presence throughout their territory.

Evidence of physical occupation over time is present throughout the territory with over 200 archeological sites demonstrating a long and unbroken history of habitation and use of all areas of the territory from high elevation terrestrial habitats to intertidal and deep ocean aquatic areas. Villages, middens, burial grounds, old canoes, lithic scatters, pictographs, culturally modified trees, and cache pit sites make up the archeological record which is, at least in the northern portion of the territory, very incomplete.

The Squamish Nation people had an internal system of customs and traditions that dictated resource access and use. Certain families had priority access to defined resource harvesting and culturally significant sites. These privileges were recognized and respected by the community at large. Most resource harvesting sites were for the use of all members of the group. The

Squamish Nation people recognized the parameters of their extensive territory and controlled and enforced access to it, including access to village sites and owned resource sites within the territory. Other tribes could use these sites as guests where they had kin ties with the Squamish Nation. Aboriginal groups that lacked such bonds of kinship with the Squamish Nation were attacked if they entered Squamish Nation territory.

The interaction between the Squamish Nation people and the land and resources of their territory has been, and remains, the defining characteristic of this people. The Squamish Nation people have stewarded the lands and resources of their territory for centuries, and, in return, have lived off its bounty and garnered their identity from it. The connection between the Nation and the territory has always been, and remains, integral to defining who the Squamish Nation people are: Their “Squamishness” depends on access to their territory for sustenance, cultural and ceremonial purposes. The ancestors of the present day members of the Nation marked their presence throughout the territory with their sustenance, cultural and ceremonial activities and the modern Nation continues to hunt, fish, bathe and dance on these same lands and waters, celebrating their connection to this territory which is their home.

2.3 Ethnographic and Archaeological Information

The Squamish Nation has existed and prospered within their traditional territory since time immemorial. The Squamish Nation people are Coast Salish people. Their language is the Squamish language. Their society is, and always has been, organized and sophisticated, with complex laws and rules governing all forms of social relations, economic rights and relations with other First Nations.

Archaeological sites reflect the presence of the Squamish Nation, showing a long and unbroken history of habitation and use of all areas of the territory from high elevation terrestrial habitats to intertidal and deep ocean aquatic areas. The territory was and still is used for travel, sustenance, and numerous other cultural uses. Squamish Nation place names still remain on the lakes, rivers, mountains, and other geographical features of the landscape. The whole traditional territory holds a legacy of use, language, oral tradition, and spirituality that closely links the people to their territory.

In total there are over 200 recorded archaeological sites within Squamish Nation traditional territory. The types of sites being found include villages, shell middens, burial grounds, old canoes, lithic scatters, pictographs, culturally modified trees, cache pits and isolated finds. Many of these sites are located in the southern and central portions of Squamish Nation territory; this reflects a number of variables such as settlement patterns, resource use and the lack of research done in the northern section of Squamish Nation territory. Currently, as a result of industrial activities and developments (forestry, residential and highway), the number of newly recorded

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

sites in the northern section of Squamish Nation territory is increasing, but many areas have yet to be properly surveyed and many recorded sites have only been cursorily examined. Map 3 shows the general location of known archaeological sites.

The presence of the Squamish Nation is not shown only in archaeological sites – the Squamish Nation is recognized in the earliest recorded non-native accounts of contact with and exploration in Squamish Nation territory. *Skxwúṃ'ish* ("Squamish")¹, transcribed as "Chomes," is first known to have been recorded on August 20th, 1827 in the Hudson's Bay Company's *Fort Langley Journal*. Other transcriptions of this same term appearing in this journal include "Whooms," "Whoomes," and "Whoomus." On 25th September 1828, for example, the Fort Langley Journal noted that "200 Canoes of Whooms [Squamish]" stopped at Fort Langley "on their way to Burrards Canal [Burrard Inlet] for the winter" (McMillan and McDonald 1827-1830:80), thus providing a brief but important reference establishing the Squamish Nation's association with Burrard Inlet. It was reported in this same HBC Journal entry that the "Whooms" had with them the body of their Chief who had died three days earlier, and that they were "Carrying him to their lands up Burrards Canal [Burrard Inlet]" (McMillan and McDonald 1827-1830:80). This HBC reference to Burrard Inlet as part of Squamish Nation territory in the late 1820s is consistent with McDonald's (1830) contemporaneous identification of the "Hoomus" (Squamish) as one of the tribes living along the "E. [east] shore [of the Strait of Georgia] N. [north] of Fraser's River."

Complementing information provided by archaeological sites and non-native accounts is the rich and complex oral history of the Squamish Nation, showing unequivocally the connection between the Squamish Nation and their territory. Two important sources of traditional knowledge about Squamish Nation territory are geographical place names and oral tradition. For example, the name of the Squamish Nation village of *ch'iyákmesh* (anglicized as "Cheakamus") meaning 'fish trap place' is a memorial of the days when this village stood beside a salmon-harvesting site where a fish trap was used together with a weir, even though traps and weirs have not been built here for several generations. The village name *skemín* meaning 'underground or pithouse,' evokes a time in the distant past when this type of dwelling was used during hard winters in the Squamish Valley. Place names in the Squamish Nation language cluster around the shoreline and river channels, the focus of their village locations, but mark also the interior, forested hunting grounds and haunts of mysterious beings. These place names are a testament to the Squamish Nation presence throughout the traditional territory since time immemorial.

¹ Note that exact transcriptions of Squamish language are not possible due to software limitations in available fonts. In many cases throughout this report, certain consonants that should have an apostrophe above are written with an apostrophe following. Correct representations of all Squamish language words can be obtained directly from the Squamish Nation.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Oral tradition records the extent of the Squamish Nation territory. For example, one traditional story tells that when a group of Squamish Nation people camped north from Whistler, too close to the Líl'wat Nation people — the people of the Mount Currie/Pemberton area — the mythological Transformers proclaimed it was wrong for them to do so. Hence, the Transformers changed these Squamish Nation people into a pile of rocks that can still be seen alongside the present-day Highway near Rutherford ("Six-Mile") Creek (Bouchard and Kennedy 1977:17).

While meetings between Squamish Nation and Líl'wat Nation people were generally amicable, both groups tell stories of less than friendly relations on some previous occasions. For example, in 1858, Hudson's Bay Company employee J.W. McKay found during his exploration from Pemberton to Howe Sound that the residents of the Squamish Nation village of Stawamus, near the Squamish River mouth, wanted to kill his Native guides from Líl'wat and that they considered themselves to be "at war" with all neighbouring tribes (McKay 1858).

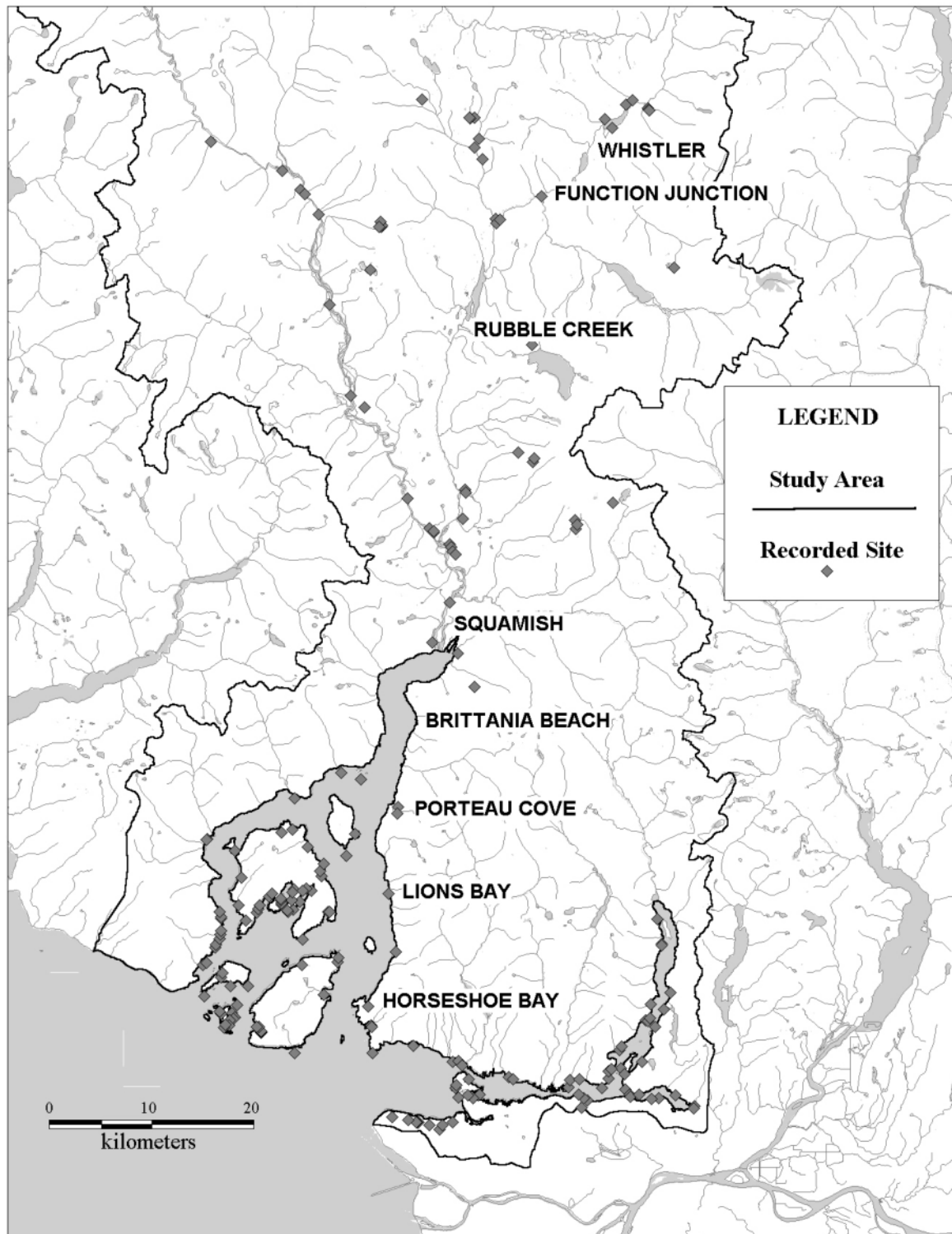
The Squamish Nation recognized the general parameters of this extensive territory, and controlled access to areas in the environs of their villages and to their owned resource sites. Members of other tribes with kin ties to Squamish Nation families would enter this territory as guests, however, just as Squamish Nation families would travel outside their own territory to places like Musqueam, the Fraser River Valley, or Sechelt where they, too, had established kin ties. Parties of aboriginal groups lacking such bonds of kinship — principally the Chilcotin and the Lekwiltok ("Northern people") — would generally be attacked when they entered Squamish Nation territory.

The Squamish Nation people camped on the Fraser River with other Coast Salish "tribes", such as the Nanaimo and Cowichan, who camped independently of them. The Squamish Nation people used the same sites annually during the summer sockeye fishing season. This suggests that their regular presence affirmed perpetual rights that were independent of their kinship with those who resided more permanently along the Fraser River.

The Squamish Nation possessed enough social unity aboriginally to be recognized as a named group, had its own distinct language, and identification with a specific area. At least in the 1800s, most Squamish Nation people selected for their children mates within the speech community, suggesting that the aboriginal population was sufficiently large to accommodate culturally imposed marriage rules forbidding second-cousin marriage. Exogamous marriages (marriage to an individual from another village) and high rates of patrilocal (i.e., living with one's father) residency, at least among those families of high status, anchored core groups of kinfolk to specific areas in which they took the leading proprietary interest.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION - SEA to SKY HIGHWAY UPGRADE PROJECT

MAP 3. Recorded Archaeological Sites in the Study Area (sites pre-dating 1846)



SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

At the time of British sovereignty in 1846, Squamish Nation people occupied many villages along the Squamish and Cheakamus Rivers, as well as a few sites in Howe Sound and Burrard Inlet. Each village contained one or more cedar plank houses constructed along the shoreline or riverbank at a site that offered defence from their enemies, fresh water and an easy transportation route. Squamish River residents also maintained seasonally occupied villages in Burrard Inlet, at places such as *sen'ákw* (False Creek), *slha7an'* (Mission I.R. No.1) and *xwmelech'stn* (Capilano River).

A Landscape Imbued with Mythology

Squamish Nation traditions speak of a time when the world was different from what it is today. It is said that “Transformers” came through and set things right, changing animals and plants into their present form and leaving a landscape marked with rocks and cliffs where transformations occurred. These locations, far from being seemingly innocuous places, are hubs of cultural significance within a vast aboriginal landscape, possessing meaning for those who know the associated traditional stories. One of the best known in the Vancouver area is the rock pinnacle known locally as “Siwash Rock” but referred to by the Squamish Nation as *slhxí7elsh* which means ‘standing up’ in the Squamish Nation language. Many versions of the story of this rock have been recorded. Some Squamish Nation people tell how this rock was once a fisherman; a reluctance to share his catch resulted in his transformation to stone. Recalling this profound event, Squamish Nation fishermen used to toss bits of food, especially a fish from the day’s catch, or coins, into the water here to show that they were not like this selfish man.

Several other transformation rocks that once marked the landscape are known to have been destroyed by construction of the railway from North Vancouver along the east shore of Howe Sound to the town of Squamish. A few other culturally significant landmarks remain, nevertheless, including the imposing “Stawamus Chief Mountain” that greets northbound travellers and draws rock climbers from around the world to its sheer cliffs.

Squamish Nation Resource Use

The Strait of Georgia environment is characterized by a variety of natural resources, local diversity, seasonal variation, and year-to-year fluctuation in the abundance of resources. These factors significantly impacted resource use strategies employed by the Squamish nation people, as well as by other Central Coast Salish groups. The fluctuations in seasonal availability of resources dictated Squamish Nation movement throughout their territory to harvest these resources and meet their needs. The following section describes briefly the types of resources available to the Squamish Nation and their movements throughout their territory to access these resources.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

At least 24 species of fish, 15 species of beach foods, 10 species of land mammals, 3 species of sea mammals, 25 species of birds, and 47 species of plants comprised the traditional Squamish Nation diet (Kennedy and Bouchard 1976a, 1976b; Bouchard and Turner 1976).

While the Squamish Nation diet was varied, by far its single most important element — shared by other Central Coast Salish groups — was the five species of anadromous Pacific salmon. Concerning the importance of salmon to the Squamish Nation people, one ethnographer commented in the 1890s that salmon to the Squamish Nation was “what bread is to the European and rice to the Oriental, and great was the distress and famine if the salmon catch was poor” (Hill-Tout 1900:490-491).

The Squamish Nation honoured the first of each salmon species caught annually with a special ritual. Anthropologist Homer Barnett described this “first-salmon” ceremony performed by a Squamish Nation ritualist when the first of each of the salmon species was caught. He noted that inherited prerogatives associated with this rite belonged to a family from one of the upriver Squamish Nation villages, although his performance of the ritual benefited the entire community who shared in the salmon harvest. The salmon runs were so important that a Squamish Nation calendrical system that divided the year into lunar units, each identified by observable changes in the natural world reckoned their arrival times.

The Squamish Nation continue to value most highly the October-running chum, or dog salmon (*Oncorhynchus keta*), which is well suited to smoke-drying and storage because of its low fat content, and because of the absence of flies during the time it goes into the rivers to spawn. Large numbers of chum salmon were taken from the Squamish and Cheakamus Rivers in the Squamish Valley, and in Burrard Inlet from the Capilano River, Seymour Creek, Indian River, and other smaller creeks.

Seasonal variation also affected beach foods. Low winter tides provided opportunities for Squamish Nation people to gather on beaches in Burrard Inlet and around the Howe Sound islands to dig the plentiful clams and cockles.

Sea mammals also have seasonal habits that limit their availability. Sea lion hunting required both skill and ritual knowledge, and therefore was restricted to a few men. In the spring, Squamish Nation hunters found these animals on reefs around Bowen Island in Howe Sound and also on islets off Gibsons Landing. Squamish Nation men commonly hunted porpoise in Burrard Inlet and Howe Sound for food.

Squamish Nation hunters killed deer, wapiti (elk), mountain goat and bear, in addition to smaller land mammals such as rabbit, but again availability was governed by the habits of the individual species, resulting in deer, wapiti and mountain goat not being hunted during the fall rut.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Specially trained Squamish Nation hunters climbed the local mountains for mountain goat. In the spring, however, the goats came down from the mountains, making it easy for the hunters to acquire fresh meat in this season. Wapiti became extinct in this area soon after early non-aboriginal settlement on the lower mainland.

The Squamish Nation diet also included seasonal plant foods, although they were relatively less important when compared with fish and animals. Bog cranberries were taken from significant patches that once grew around False Creek and Brackendale. Blueberries were plentiful around upper Lynn Creek and Grouse Mountain on Burrard Inlet's north shore, and especially in the environs of the upper Cheakamus River and Whistler area. Blackberries were found on hillsides, most commonly after forest fires.

The following is a list of culturally significant plants utilized by the Squamish Nation and which have been identified as dominant species along the highway corridor. This partial list of plants used by the Squamish Nation for sustenance, spiritual, and medicinal purposes illustrates their use of, and dependence on, the myriad of resources in their territory.

Spiny-wood fern	Sword fern	Bracken fern	Western red cedar
Douglas-fir	Western hemlock	Skunk cabbage	Cat-tail
Vine maple	Broad-leaved maple	Devil's club	Oregon grape
Red alder	Red elderberry	High-bush cranberry	Salal
Labrador tea	Alaska blueberry	Red huckleberry	Cascara
Bitter cherry	Salmonberry		

Variability in food resources meant that provisions were not always plentiful despite the region's great resource endowment. Periods of scarcity did occur, as evidenced by the presence, albeit rare, of starvation in Squamish Nation oral traditions. This undoubtedly accounts for the Central Coast Salish practice of establishing a network of affinal ties among groups of relatively equal status, with whom exchanges of wealth and food could be arranged. It also accounts for the Squamish Nation people's fairly rigid adherence to a seasonal round of resource acquisition that tended to maximize their ability to harvest available resources throughout their extensive territory. This required, of course, considerable knowledge of the landscape and its resources, some of this knowledge is described below.

The Yearly Round

Squamish Nation traditions included a fishing, hunting and gathering complex, which directed seasonal movements and group aggregation. No Coast Salish group traditionally kept domesticated food animals, nor did they raise agricultural crops. Many resources a family might require could be obtained nearby, but exchange, group movement and kin ties permitted people to expand the resource base beyond their immediate village, and sometimes beyond the parameters of the tribal territory.

Ethnographic evidence reveals a Squamish Nation sustenance pattern of periodic movement between seasonally – occupied villages in the Howe Sound/Squamish Valley area and Burrard Inlet. The yearly round for the Squamish Nation was fairly rigidly determined. In the spring, family groups began leaving the winter village to harvest food and materials as they became procurable at specific locations. Occasionally, the time when resources became available in one's home territory conflicted with the harvesting of a resource in the territory occupied by one's extended kin, thereby requiring that resource to be obtained through exchange.

Squamish Nation people traded extensively and acted as middlemen in a trade that exchanged coastal and interior foods and materials. A trail from Howe Sound that passed up the lower Squamish River and north through the Cheakamus River canyon, before proceeding to the Pemberton Valley, formed the most important coastal-interior trade route in southern British Columbia, according to ethnographer James Teit, writing in the early 1900s (Kennedy and Bouchard 1998:176). Another route led from the upper Squamish over a glacier to the Sechelt at Jervis Inlet, where the Squamish Nation traded their smelt (Kennedy and Bouchard 1976a). The Squamish Nation also carried on a trade in highly valued mountain goat wool to the Cowichan on Vancouver Island and likely other neighbouring groups as well (Kennedy and Bouchard 1976b). Archaeological investigations in Squamish Nation territory have uncovered an obsidian source at Garibaldi that supplied rock now found in sites on Vancouver Island, traded from neighbour to neighbour.

Studies of resource availability within the central Strait of Georgia area, along with eyewitness accounts from the 1820s-1860s, permit an outlining of the general course of the traditional Squamish Nation seasonal round.

During the winter, Squamish Nation people lived in their winter villages on the Squamish and Cheakamus rivers, and at the mouth of the Capilano River. Apart from a few particularly cold areas on the upper Squamish River, where Squamish Nation people constructed pit houses partly buried in the ground, they resided in large shed-roofed cedar-plank dwellings that housed a number of related families (for a description of these houses see Suttles 1992). The winter months were devoted mostly to home activities and ceremonials, such as winter spiritual

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

dancing. Some food gathering did take place, such as ice fishing for trout in lakes, fishing the late coho that could be found until March in Tenderfoot Lake near Cheakamus, and shooting or netting the waterfowl that wintered in the area, especially in the upper Howe Sound. Trolling for spring salmon could also take place if the weather permitted. People who lived close to Howe Sound, such as those at the village of Stawamus, had access to ling cod eggs deposited around Defence and Anvil Islands during their January to February spawn.

The arrival of spring signalled the resumption of the active sustenance quest. Groups of families moved away from the winter villages and travelled to various seasonal camps where they lived in mat lodges or houses constructed of the planks removed from winter dwellings. A variety of spring plants were gathered by women and children; at the same time, their menfolk frequently fished for herring in such places as Burrard Inlet, Horseshoe Bay, Shannon Bay and several other sheltered bays in Howe Sound. In the spring, gull eggs were gathered from the low rocky islets and ledges. By April, people would fish the eulachon runs in the Squamish, Indian and Fraser Rivers. Anthropologist Homer Barnett recorded that the eulachon fishery brought together all the Squamish River people, who camped at Stawamus near the mouth of the Squamish River for this fishery. Once this fishery finished, fishermen prepared for the steelhead run. Steelhead spawn during April and May and Squamish Nation fishermen caught them in numerous creeks including all tributaries of the Squamish River, the Cheakamus, Seymour, Lynn, and Capilano Rivers, around West Bay, and in a large pool on the Squamish River near the Tantalus (which was noted for particularly large fish). The people gathered seaweed from the rocks and dried it in the sun. They scraped inner cambium from the trees at this time, as well. Throughout Squamish Nation territory can be seen trees where former generations obtained cambium for food or bark for weaving baskets and mats.

During the early summer, while Squamish Nation fishermen waited for the salmon runs to begin, deer, wapiti (elk) and goat hunting began. Spring salmon could be caught by trolling at this time before they entered the spawning streams. Beach foods, plants and berries were gathered throughout the summer months.

By mid-July, the water level of the rivers and creeks had subsided enough to fish the second run of spring salmon entering their spawning streams. The fishing of the sockeye and pink/humpback runs began shortly after, although Squamish Nation fishermen obtained sockeye only at the Fraser River. More deer, wapiti and goat hunting, and smoke-drying the meat, would take place while the fishermen waited for each run of salmon.

By late summer, some Squamish Nation families travelled to the Squamish Valley, and waited for the arrival of the chum salmon; others remained at the Fraser River fisheries or in Burrard Inlet. In preparation for the run, they refurbished the fish weir across the Cheakamus River, replacing any poles that washed away in the spring freshet and mending the lattice screens. This

was the time when small animals were hunted, and more deer, wapiti and goat meat was put away for winter, before the rutting season began in October. Some Squamish Nation families joined the Katzie at the extensive cranberry and blueberry bogs along the Fraser. Those Squamish Nation families residing in Burrard Inlet picked bog cranberries at the head of False Creek, and those who had returned to the Squamish River collected baskets full of these berries from smaller bogs east of Brackendale.

During the fall, the most important activity was the harvesting of the prized chum salmon run, which continued late into November. Squamish Nation elders recalled that around 1900, the chum salmon were so thick in the Squamish River around Brackendale that it was apparently possible to "cross the water on their backs." Root foods such as fern rhizomes were dug, and late-ripening fruits were gathered. Squamish Nation men caught fall-spawning trout, eaten both fresh and dried. They hunted deer until the rut began around the full moon in October, except on Gambier and Anvil Islands, where the rutting season began a month earlier. Mountain goat could be hunted through to the end of November, a time that corresponded with the conclusion of the chum salmon run.

The Squamish Nation was among those having territory where mountain goat could be found at higher altitudes along the slopes of the Coastal Mountains. On the west side of Howe Sound, Squamish Nation hunters travelled up to the mountains behind Woodfibre to search for goat and, on the east side of the Sound, far into the mountains towards the Lions. Those people residing in Burrard Inlet hunted in the mountains along the North Shore. Not just the meat was desired, for the wives of wealthy men spun goat and dog wool into threads to be woven into fine blankets. Blankets were the most important article of wealth in the Central Coast Salish exchange system. The early fall was also the season for potlatching among Central Coast Salish peoples where some of these blankets adorned high status individuals who presented gifts of blankets to guests of equal status. Then after the chum salmon run finished in late November, Squamish Nation life evolved into the more sedentary winter routine.

Ownership of Land and Resources

Ownership of land and resources in Central Coast Salish society was conceptually different from the ownership of other types of resources. Individuals owned personal property; this included canoes, weapons, slaves, and hunting and fishing implements. The cognatic descent group (that is, a group of kin who claim descent from a common ancestor), as a whole, owned the highly valued stock of names and ceremonial prerogatives, including songs and dances, in addition to private advice and knowledge such as magical formulae. Most land and resources were not, however, privately owned. As a general rule, most resources were available to all, and only a few sites were considered to be the property of specific groups. That there were widely accepted customs dictating access to resources is incontrovertible.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Evidence concerning Squamish Nation resource ownership is not completely consistent however. Hill-Tout (1900:491) recorded that he could not find evidence among the Squamish Nation "that any family or village had exclusive rights over fishing, hunting, or berry and root grounds." However, Barnett (1935-1936) recorded entirely contrary data on this point and indicated that particularly valuable resource sites could be owned by families and frequently were. Examples from throughout the Central Coast Salish area reveal that specific descent groups could own sturgeon and salmon fishing sites, clam beds, cranberry bogs, wapato ponds, camas grounds, waterfowl refuges, sea mammal hunting sites, and mountainous areas where mountain goats were hunted. Some Squamish Nation families living around the mouth of the Cheakamus River were noted as having obtained their high status through the exchange of mountain goat wool and mountain goat wool blankets. All Squamish Nation people were free to camp at less productive sites to gather food and resources, and they could receive a share of the catch at owned fish weirs (where their labour would be required to adequately harvest the run) (Suttles 1958; Barnett 1935-1936).

Rights of access to Squamish Nation fisheries appear to have varied significantly. The data indicate that shared access prevailed at some sites, that others were open areas where Spring salmon were trolled, and that others were individually-inherited sites where a specific technology was employed. One Squamish Nation account notes that the fish traps used on the Capilano River were the property of individual fishermen and that trespass could lead to friction (Moody 1956). Another account states that any Squamish Nation person could fish by other means in the vicinity of such sites, but that non-owners were restricted from using the fish traps (Barnett 1935-1936). Sites where dip-nets could be used on the Squamish River were said to be owned by individual fishermen (Kennedy and Bouchard 1976b). Barnett's (1935-1936) Squamish field notes confirm this information, stating that others who wished to use the dip-net and the site presented the owner with a blanket or similar payment. Village groups had rights to fish the salmon runs in locations near their winter habitations, apart from those sites regulated by individual ownership.

Religious Practices

Religion for the Squamish Nation, and for other Central Coast Salish people, is an individual affair that requires access to areas of wilderness — places away from humanity, but not necessarily the same place for all persons. There are also specific sites where groups of people go for ritual bathing. Knowledge of such places currently in use is generally restricted to members of the indigenous community and invited guests. It is nonetheless important when evaluating impacts resulting from proposed development to consider the Squamish Nation people's potential and current use of their territory for religious purposes.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

In earlier times, all boys and many girls were sent alone into the wilderness where they fasted, bathed themselves in cold water, and scrubbed their bodies with conifer boughs. The activity had to be conducted away from humanity, in a pure place, as the objective was to find a non-human helper. The Central Coast Salish had no belief in a single Creator, a Mother Earth or a Great Spirit. Each individual person trained and entered into a partnership with a new helper that appears in a vision. In later life, the vision or *syéwen*, now nestled inside the individual, manifested itself in a spirit-sickness and came out as a song.

Though Squamish Nation youth no longer spend long periods alone in the wilderness at the time of puberty, individuals who become spirit dancers undergo an initiation that brings out their song. As part of this induction, and for on-going ritual bathing, dancers require access to areas away from other humans, where a clean stream flows and conifer boughs grow abundantly. In these places Squamish Nation people pray, bathe, scrub themselves with boughs, and place their ceremonial paraphernalia away from other people, preferably where the wind can blow through it. Hence, areas of wilderness continue to be necessary for these individuals to practise their traditional religious beliefs. Additionally, some Squamish Nation people who are not dancers undergo ritual bathing in these same locations to provide themselves with physical and spiritual strength.

The Squamish Nation Today

Residential schools, *Indian Act* governance, poverty, social problems, and reserve creation are just some of the factors that, over the last century, have impacted the links between Squamish Nation members and their culture and territory. However, in the latter decades of the 20th Century and continuing, there has been a resurgence of interest in and practice of traditional culture and a reconnection with the land. For example, members currently use specific sites that have cultural significance for bathing and for keeping cultural regalia. Squamish Nation members have a keen interest in encouraging the growth of their culture and their language. In fact, it is seen as an imperative because it is viewed as an act of survival.

Because of the key connection between the Squamish Nation culture and the traditional territory, there are fundamental concerns regarding the environmental quality of the territory, as expressed in *Xay Temixw*. There is an intrinsic value to the environment for the Squamish that cannot be overstated. Therefore, the Nation has a keen interest in maintaining the quality of the environment and of the stock of resources in the traditional territory, including access to wilderness areas.

Squamish Nation interests are not confined to what may be considered the “traditional” First Nations issues of culture and environment. The Nation also has economic and fiscal interests in its territory. As a government, the Nation seeks to participate in the economy of the region and

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

the province as an equal partner and it seeks to provide fair economic benefits to its people, which will require closing the substantial income gap that exists between the native and non-native populations.

The Nation has asserted its aboriginal rights and title to the territory in a variety of ways, including the treaty process, negotiations with government and industry regarding development in the territory, and in its land use plan, Xay Temixw. The Nation is participating in the treaty process to reach agreement regarding the constitutional protection afforded to Squamish Nation rights and title in accord with section 35 of the *Constitution Act of 1982*. The Squamish have never ceded or surrendered title to their lands, rights to their resources, or the power to make decisions within their territory. Through the treaty process, the Nation is asserting its rights with regard to Squamish Nation lands, waters and resources. Negotiations with the federal and provincial governments will include discussions pertaining to the identification of rights to those lands, waters and resources that constitute the Squamish traditional territory, and the compensation to be paid for the alienation and utilization of these lands, waters and resources. Xay Temixw is an assertion of title to the traditional territory and an exercise of governance by the Nation's citizens and government over its territory. The plan expresses the forward-looking aspirations and vision of the Nation regarding its territory and provides direction for current and future land uses.

2.4 Activity Site Lists

The following lists summarize specific types of land use that have occurred along the Sea to Sky Highway corridor, as reported during ethnographic interviews with Squamish Nation members. The charts have been organized into three convenient geographic areas: Howe Sound, Squamish River, and Cheakamus River. Locations of sites have been listed in each area, and include trails, archaeological sites, spiritual/ ceremonial use sites, campsites, fishing sites, plant harvesting, hunting grounds, trapline areas, village sites, shellfish and crustacean harvesting, locations of traditionally-named places, and pictographs. Associated activities have also been noted.

HOWE SOUND

Trails

- Important intercoastal trade route from Howe Sound to the Pemberton Valley passing through the Squamish and Cheakamus Valleys
- Access trail to the Lions began in the area between Sunset Beach and Lions Bay
- Trail into the Lions followed one of the creeks between Lions Bay and Loggers Creek
- M Creek, just north of Magnesia Creek, had trail leading to mountain goat hunting area
- Trail up Logger's Creek to access "big burn" where deer hunted
- Trail up first creek south of Deeks Creek to get to mountain goat hunting area
- Trail up Deeks Creek to Deeks Lake ("Andrew Natrall's Trail")
- Trail a half kilometer north of the bridge across Deeks Creek – access to the top ridges
- One kilometer north of the Deeks Creek bridge – trail to access the tops of the ridge
- Trail on benches between Deeks Creek and Brunswick Point to access ridges south of Deeks Creek
- Trail between Squamish and North Vancouver that went up Capilano Valley, through South Valley and then toward Furry Creek
- Trail from the water near the salt/sand shed at Porteau Cove up to the ridges between Porteau Cove and Furry Creek
- Trails from pull-off between Kallahne and Furry Creeks led into the hills immediately east of the highway

Archeological Sites

- Cambium scraping, bark gathering – throughout Squamish territory
- Horseshoe Bay – midden, bones and projectile points, as well as a burial site (burials may have been removed)
- Disbrow Creek mouth – shell midden
- Mouth of creek immediately north of Disbrow – shell midden
- Near the mouth of Charles Creek – artifacts have been found
- Red ochre site on the hillside above the Sea to Sky Highway about one kilometer south of the bridge over Magnesia Creek
- Possibly remains of a smokehouse on the south side of the mouth of Furry Creek
- Britannia Beach – three graveyards located here, according to one source
- Islet off Britannia Beach – aboriginal burial islet

Spiritual/ceremonial Use Sites

- Nelson Creek – special place where Squamish Nation people could cleanse
- Through the 1970s, a place on Nelson Creek, located 500 yards north of the highway was used for

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

ritual bathing re winter dance ceremonies

- Throughout Squamish Nation Territory – individual access to areas of wilderness
- Numerous places around Howe Sound for ritual bathing
- Deeks Creek – ritual bathing site known for its supernatural qualities
- Deeks Creek – important for spiritual preparation
- Squamish Nation people believed that there was a *stl'alkm* ('powerful spirit') at Deeks Creek
- In the 1930s dance poles could be seen left in the trees near Deeks Creek
- Dancers returned to a place high up Deeks Creek in the 1960s – seldom used today
- First creek south of Deeks Creek used of spiritual cleansing and ritual bathing
- Transformer rocks on the shore of the northern portion of Porteau Cove
- Now-destroyed rocks shaped by the Transformer – throughout the area
- North side of Furry Creek – female ogre was transformed into stone here
- Furry Creek – ritual bathing site used recently
- Half a mile north of *xel'xelús* is *yik'm* – (meaning 'filings'), a large irregular-shaped rock perhaps 30 feet long and 10 feet high sitting on the beach – Transformer rock
- Britannia Beach – place where spirits are known to be
- Britannia Beach (Copper Mine) – *shishay'u7áy* – 'place of screech owls' – place feared by the Squamish Nation due to the abundance of Screech Owls that were once plentiful here
- Browning Lake – special place to the Squamish Nation; traditions and spirits associated with the place (supposedly bottomless and connected to Howe Sound)
- One kilometre north of Watts Point on the shoreline are three distinctive transformer rocks
- Bay just northeast of point .6 kilometers north of Watts Point – Squamish Nation tradition indicates that this was the place where the Squamish Nation had their first encounter with White People in Howe Sound
- Rocky hill on the west side of the present day Sea to Sky Highway opposite the Stawamus Chief – traditional story about a beaver crying and causing rain and childhood playground for climbing and hiking
- "Stawamus Chief Mountain"

Campsites

- Campsite used when travelling on Nelson Creek
- Horseshoe Bay – well known camping area
- "Long Point" (*kél'etstn*) – camping area used especially when deer hunting in the area
- Traditional campsites on Deeks Creek
- Anchorage and camping spot half a mile north of the mouth of Deeks Creek
- Porteau Cove and Furry Creek camping areas for people travelling from Squamish to North Vancouver
- Britannia Beach
- Daisy Creek mouth – good camping spot
- Watts Point – a few hunters maintained cabins in the area until the 1940s
- Bay just northeast of point .6 kilometers north of Watts Point
- Mouth of Shannon Creek – used still in the early 1900s

Fishing Sites

- Gaff-hooking of chum salmon in a creek above Eagle Harbour (likely Nelson Creek)
- Herring fishing at Horseshoe Bay, Shannon Bay and several other sheltered bays in Howe Sound
- Ling Cod eggs around Defence and Anvil Islands
- Alberta Bay – good trolling place
- Brunswick Point – Spring salmon trolling

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Just north of Porteau Cove – Spring salmon trolling – excellent place for big springs
- Basin located off the end of the dock in Porteau Cove – Spring salmon trolling area
- Close to the mouth of Kallahne Creek – Spring salmon trolling area
- Furry Creek – Steelhead run
- Britannia Creek
- Hand trolling for salmon along the coast from Britannia Beach northwards
- Off Watts Point – good trolling for spring salmon
- Northeast of the gravel pit on the north side of Watts Point and West of the Point – sites where nets were set for spring salmon
- Winter springs fished in the deep water from Watts Point to the mouth of the Creek below Shannon Falls
- Mouth of Shannon Creek – herring egg collection site
- Mouth of Oleson Creek – trout fishing
- Oleson to Shannon Creek – salmon trolling
- Upper reaches of Howe Sound near the mouth of the Squamish – Halibut, red snapper, cod, Spring salmon

Plant Harvesting

- Cambium scraping, bark gathering – throughout Howe Sound area
- Berry harvesting around Howe Sound
- Salal and blueberry harvesting around the mouth of Deeks Creek
- Porteau Cove – Bitter cherry bark harvested for medicinal use in the 1990s – along the highway near the salt/sand shed
- Near Furry Creek – Salal and other berries were picked
- By the gravel pit at Furry Creek – roots were dug around 1960
- Huckleberry gathering along the west side of the Sea to Sky Highway (“Mile-Hill”) that extends north from Furry creek – recently harvested here
- Browning Lake – Sage tea harvest
- Watts Point – cat-tails
- Both sides of the highway in the vicinity of Shannon Falls – huckleberry and blackberry harvesting until 1958

Hunting Grounds

- Sea lion hunting on reefs around Bowen Island and on islets off Gibsons Landing
- Seal hunting throughout Howe Sound
- Porpoise hunting in Howe Sound
- Shooting and netting waterfowl in Upper Howe Sound
- Gull egg harvesting from low rocky islets and ledges around Howe Sound
- Deer hunting on Gambier and Anvil Islands
- Mountain Goat hunting on the mountains behind Woodfibre
- Mountain Goat hunting far into the mountains towards the Lions
- Hills behind Horseshoe Bay north of Eagle Harbour from which Nelson Creek flows were important hunting grounds for the Squamish Nation in the early part of the 20th century – deer, blue grouse, black bear
- Deer hunting above the Highway, just east of Nelson Creek prior to the mid-1960s
- Duck hunting on islands at the entrance to Horseshoe Bay
- Mountain Goats were hunted above the area between Sunset Beach and Lions Bay well into the 1900s
- Deer hunting in the hills leading up to the Lions

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Alberta Bay – good place to shoot “black ducks” and goldeneyes
- Alberta Bay – hunting deer, black bear, and blue grouse
- Lions Bay to Loggers Creek is an area where considerable hunting took place
- Deer hunting up Magnesia Creek
- Open area above “Long Point” – “big burn” – favourite deer hunting area
- Steep high cliffs up M Creek – Mountain Goat hunting area
- Brunswick Point – “black duck” and goldeneye hunting area
- Deer hunting up Deeks Creek on benches from Deeks Creek to Brunswick Point
- Deeks Lake – hunting area for deer mountain goat, blue grouse and black bear
- Deer hunting on ridges south of Deeks Creek
- Britannia Range was especially noted for mountain goat hunting – used to come close to the road near Deeks Creek
- Area around the first creek south of Deeks Creek for mountain goat hunting
- Mouth of Deeks Creek for black ducks – used recently
- Area between Deeks Creek and Brunswick used for hunting deer, goat, etc.
- Towards the headwaters of Kallahne Creek – mountain goat hunting area
- Porteau area near road – hunting area for deer, blue grouse, and willow grouse
- Ridges immediately to the east of the highway south of Furry Creek to Porteau hunted in the 1950s
- Highway hunting between Porteau Cove and Furry Creek – most important winter deer hunting grounds for Squamish Nation members from North Vancouver
- Area on both sides of Furry Creek were known for deer-hunting – some of the largest deer came from this area – in particular the north side of the creek (“Sugar Loaf “ or “Buck” Mountain)
- Flats north of Britannia Creek right up to Shannon Falls – hunting grounds for deer and willow grouse (big deer)
- South of Britannia Beach – deer hunting
- Hills around Browning Lake and in a ravine just south of the lake – deer and blue grouse hunting
- Goat ridge, five kilometers east of Watts Point, – particularly good place to hunt mountain goats – used regularly until the early 1900s
- Watts Point – deer hunting area until the 1950s
- Hills east of Shannon Falls
- Behind Shannon Falls towards the Stawamus Chief south to Klahanee and to the west side of the highway – elk and big deer hunting to the mid-1950s
- Around the mouth of Shannon Creek – blue grouse
- Upper side of the road around the Shannon Falls area – grouse and smaller game
- Area below *skeláw* on upper Howe Sound – duck and grouse hunting

Trap line area

- Watts Point north to Little Mountain –trapline for raccoon, mink, marten and skunk, used until the 1940s

Village Site

- Several winter villages located around Howe Sound

Shellfish and Crustacean Harvesting

- Clams and cockles gathered on beaches around Howe Sound Islands
- Clam digging and smoking done in the area before the Port Mellon pulp Mill
- Possibly oysters on the south side of Furry Creek
- Crabs were taken from near the docks at Britannia Beach in the earlier part of the twentieth century

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Locations of Traditionally-Named Places

- *k'itlálsm* – Eagle Harbour
- *ch'axáy'* – Horseshoe Bay
- *temlh* – point of land south of Sunset Marina and the mouth of Disbrow Creek
- *p'ap'k'* – area south of Lions Bay at the mouth of Lone Tree Creek, where members of the Squamish Nation used to stop to get fresh drinking water or clear spot just up from the mouth of the Creek
- *ch'ich'iyúy* (meaning 'the Twins') – the Lions
- *kél'etstn* – "Long Point"
- *stl'alkm stakw* – Deeks Creek
- *lhk'etksn* – area half a kilometer north of Deeks Creek
- *xwáw'chayay* – the part of Porteau Cove that is sheltered by a tongue of land at the southwest corner of District Lot No. 1748
- *tl'etl'ch'ál'km* – area on the northern end of Porteau Cove where Transformer stones rocks once stood
- *énwilh spálhxn* – area immediately south of the mouth of Furry Creek and occasionally the creek itself (meaning 'middle flat land')
- *xel'xelús* – not too far north of the mouth of Furry Creek
- "wuk-wuk-kum" – square blocks of rock on the shore not too far north of the mouth of Furry Creek
- *shewlháwt'* (meaning 'herrings') – bluff 100 yards or so north of *xel'xelús*
- "whul-um-yus" – slightly north of *shewlháwt'* – a long rock in the vicinity of District Lot No. 2932
- *yiik'm* – (meaning 'filings') a large irregular-shaped rock created by the Transformer sitting on the beach half a mile north of *xel'xelús*.
- *shishay'u7áy* – area of Britannia Beach (Copper Mine) and sometimes applied to the mouth of Daisy Creek
- "newshawuie" – possibly the mouth of Britannia Creek
- *swakwl* (meaning 'common loon') – applied to a large boulder near the water's edge about four hundred yards south of the Britannia Beach mill on District Lot No. 2001
- *ntsewásus* (meaning 'double mountain-goat blanket') – Goat Ridge which lies five kilometers east of Watts Point
- *sts'its'a7kin* (meaning 'small amount of cat-tail plants') – Watts Point
- *lexwlúxwls* (Squamish name for Lil'wat) – .6 kilometers north of Watts Point – Lil'wat people changed into rocks here by the Transformer
- *xwlxwelín* (meaning 'White people') – bay just northeast of *lexwlúxwls*
- *txwn7us* (meaning 'facing this way') – small bay situated one kilometer south of Gonzales Bay
- *xwtsíkiy'ikw* (meaning 'stick-poke-on-head place') – rock on the shore just south of the Darrell Bay ferry wharf (the first white streak of bare rock laying along the water's edge, south of Darrell Bay)
- *kwtsá7tsutsin* (meaning 'island in the mouth') – Darrell Bay or "Shannon Bay"
- *kwékwetxwm* (meaning 'rumbling noise') – Shannon Falls
- *skel'áw* (meaning 'beaver') – low rocky hill on the west side of the present Sea to Sky Highway opposite the Stawamus Chief Mountain

Pictographs

- At *temlh* (see above) – south of Disbrow Creek
- *xel'xelús* (see above) – mouth of Furry Creek is the location of two sets of pictographs
- Browning Lake
- Possibly part way up Shannon Falls – cave with pictographs

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

SQUAMISH RIVER

Trails

- Important intercoastal trade route from Howe Sound to the Pemberton Valley passing through the Squamish and Cheakamus Valleys
- Trade route up the Upper Squamish Valley over a glacier to the Sechelt at Jervis Inlet for trading Smelt
- Canoe route up the former eastern channel which flowed alongside Squamish Island
- Trail on the south side of Meighan Creek – crossed Sea to Sky Highway
- Trail from the west going up to Alice Lake – crosses the Sea to Sky Highway about 1/5 kilometer south of Hop Ranch Creek
- Trail crossed the Sea to Sky Highway about a kilometer south of Dryden Creek – Waiwakam I.R. 14 to Alice Lake

Archeological Sites

- Possibly pit house sites may be found on the upper Squamish River
- Cambium scraping, bark gathering – throughout Squamish Nation territory
- South side of Mamquam Blind Channel – artifacts were found when the bridge was being constructed; Site of fish camp near the high school – possibly burials may be found; midden reported in area

Spiritual/ceremonial Use Sites

- Throughout Squamish Nation territory - individual access to areas of wilderness
- Numerous ritual bathing sites up the Squamish Valley
- Rocks shaped by the Transformer – throughout the area
- “Stawamus Chief” – traditional stories; links between the Chiefs of the Nation and the Stawamus Chief Mountain; faces in the rock face; etc.
- Stawamus River, pond on the lower creek downriver from the rail crossing – ritual bathing site for spiritual dancers; location of sweat lodges; spiritual cleansing location – still used
- *smu7k* (meaning ‘drop from rear end’) – site on the west side of the highway slightly north of the northern boundary of I.R. 24 (east side of the Mamquam Blind Channel) – Squamish Nation men trained to achieve spirit power here
- Raised flats on the east side of the Squamish River where there is now a subdivision and the southern part of the town of Squamish– site where a type of field hockey game was played
- Mamquam River – blowing noise from up river during heavy rains was a sign of a flood

Campsites

- All Squamish River people camped at the mouth of the Squamish, at the village of Stawamus for the Eulachon fishery
- The mouth of the Squamish River – location of a number of known fishing camps
- Near the north end of the Squamish River’s eastern branch (location of high school) – fishing camp
- Around Squamish Island – various campsites

Fishing Sites

- Eulachon harvesting on the Squamish River , especially up the west side of the most westerly channel

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Intertidal area at the mouth of the Squamish River – important fishing area
- Herring harvest site on Blind Channel
- Steelhead fishery in a large pool on the Squamish River near the Tantalus – noted for its large fish
- Brackendale -- chum salmon harvest – around 1900 (“cross the water on their backs”)
- Dip-net fishing for salmon on the Squamish River
- Squamish River mouth – herring fishery until the pollution in the Sound became too bad
- Stawamus Creek around the mouth and up stream – highly favoured fishing spot – pink salmon, chum, coho, steelhead, trout, and springs – gaff-hook fishing in the Stawamus in the 1990s
- Mamquam Blind Channel at railway bridge crossing and where the “red bridge” used to cross – noted salmon fishery – coho, chum, steelhead and trout - fished until the 1940s
- Government wharf located a short distance downriver from where the highway crosses Mamquam Blind Channel – herring fishery until the 1960s
- Squamish River eastern branch – Eulachon and sturgeon – disappeared sometime around 1930
- *kw’ela7en* (meaning ‘ear’) – a Squamish Nation settlement site on the east side of the Squamish River in the area of the B.C. Rail maintenance yard at the north end of Squamish – good fishing site and salmon smoke-drying location
- Squamish Valley -- Chum salmon harvested on both Squamish and Cheakamus Rivers
- Mamquam River – steelhead, trout, coho, pinks, springs, and chums – especially good for coho until mid 1950’s
- Mamquam River near the pumping station – set-net site for springs, coho and chum
- Mashiter Creek confluence with Mamquam River – former fishing site
- Mouth of the Mamquam – eulachon
- Little creek just east from the present-day houses at Kowtain – late running coho (gaffhooks)
- Meighan Creek – coho, spring, pink, steelhead, chum and trout
- Hop Ranch Creek – coho, pinks, chums, Dolly Varden, trout and spring – late run coho (Jan and Feb) used when people were running out of– still fished in 1968
- Creek near Hop Ranch Creek – Spring salmon
- Dryden Creek often fished on the east side of the highway – coho, chum, trout

Plant Harvesting

- Stawamus Reserve – cascara and wild cherry bark; blackaps, huckleberries, blueberries, and salal berries
- Along the Stawamus River west of the old bridge – blackberries and huckleberries
- Along the Stawamus up where the water supply reservoir was in the 1920s – blueberries
- Area around Valleycliffe – blueberries
- Logging Road following the Mamquam – salmonberries
- Swampy area east of Kowtain and around Brackendale – bog cranberry harvesting, including area east of the Sea to Sky Highway
- Cambium scraping, bark gathering – throughout Squamish Nation territory

Hunting Grounds

- Hunting of waterfowl around Blind Channel
- Intertidal area at the mouth of the Squamish River – important hunting ground
- Upper reaches of Howe Sound near the mouth of the Squamish – ducks, deer and black bear
- Behind the Stawamus Chief entering from the north and around little mountain (across from the Chief) – grouse and deer
- Top of the Stawamus Chief Mountain – few mountain goats
- Near the Stawamus Creek intersection with the highway – grouse in the late 1940s
- 11 miles up Stawamus Creek – deer and blue grouse in the early 1980s

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Upriver from Valleycliffe – blue grouse in the early 1980s
- In the area of “Hospital Hill” – blue grouse hunting with a slingshot, as well as deer hunting
- East of the highway near the north end of the Stawamus Indian Reserve where there used to be a tiny lake and little creek – willow grouse hunting into the 1960s
- Stawamus River – seals
- Sloughs on both sides of the present highway between Meighan and Dryden Creeks – mallards in the 1960s
- Along trail between Waiwakum I.R. 14 and Alice Lake on the east side of the highway – blue grouse and deer

Trap line sites

- Around the Stawamus Reserve – raccoons
- Junction of Mamquam and Mashiter to the headwaters of Mashiter and including all its tributaries and also lands north and west to include Alice Lake and areas south of the Cheekeye River as far west as the Cheekeye’s confluence with the Cheakamus River, then extending South along the east side of the Cheakamus and Squamish Rivers and back down to the Mashiter. Mamquam confluence – trapline in the 1940s
- Swampy area east of what is now the highway (Sea to Sky Hotel) – muskrat until the 1940s

Village Sites

- Village of Stawamus, near the mouth of the Squamish River
- Intertidal area at the mouth of the Squamish River – village sites along both sides of the Squamish, the Stawamus and the creeks that flowed into them; five traditional village sites, two of which were fortified (four reserves)
- Adjacent to the mouth of the Squamish River – Stawamus village site, one of the major Squamish villages
- On top of the Stawamus Chief Mountain – possibly village site
- South side of the Mamquam Blind Channel – fortified village abandoned around 1850
- Numerous winter village sites along the Squamish River
- Possibly location of pit houses may be found on the upper Squamish River
- Mouth of the Cheakamus River
- Village sites along the Squamish River were traditional wintering locations
- 1869 recognition by the Colonial government of traditional Squamish Nation village sites in Burrard Inlet
- 1876 – Chiefs indicate that they were expecting large reserves on Squamish River
- The Squamish Nation request lands in the area of Squamish and are granted reserves in that area
- 17 reserves granted along the Squamish River from the mouth up to *p’uy’ám’*
- A former Squamish Nation settlement site on the east side of the Squamish River in the area of the B.C. Rail maintenance yard at the north end of Squamish
- Mamquam Island - village site
- Mamquam River upstream from Mamquam Island – village site
- *kaw’tín’* (Kowtain) – traditional village site about a mile north from today’s highway crossing of the Mamquam River and not far west of the present highway – originally on an island on the left (east) bank of the Squamish River – new site reserved including both the island and the mainland for Reserve 17
- East side of the Squamish River, just south of Brackendale – major village – early 1900’s settlement of at least four houses, two of which were longhouses – now a reserve, Seachem

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Locations of Traditionally-Named Places

- *st'ám'es* – original Squamish Nation name anglicized to Stawamus
- *skwaháye7en* (meaning 'pierced ear') – hole through a portion of the Stawamus Chief rock face
- *smu7k* (meaning 'drop from rear end') – site on the west side of the highway slightly north of the northern boundary of I.R. 24 (east side of the Mamquam Blind Channel)
- *k'iyaxenáy'ch* (meaning 'fence or stockade along the side') – fortified village on the south side of the Mamquam Blind Channel and also the former eastern channel which flowed alongside Squamish Island and on which the town of Squamish was built
- *kw'kwinstn* (meaning 'cause to hit on chest') – location of special tree associated with *k'iyaxenáy'ch*
- *xi7xay'ús* (meaning 'laughing face') – northern tip of Squamish Island
- *kw'éla7en* (meaning 'ear') – a former Squamish Nation settlement site on the east side of the Squamish River in the area of the B.C. Rail maintenance yard at the north end of Squamish
- *mámxwem* – Squamish Nation place name from which the English name Mamquam is derived
- *tselklhtín'* (up the Mamquam) – Squamish Nation name for village site on upper Mamquam River
- *kaw'tín'* – traditional village site about a mile north from today's highway crossing of the Mamquam River and not far west of the present highway
- *s7ín'ukem* (meaning 'the other foot') – Meighan Creek
- *siyích'm* (meaning 'already full') – traditional settlement east side of Squamish south of Brackendale
- *smálutsin* (meaning possibly 'to make indirect reference to the dead') – Hop Ranch Creek
- *súsu7mam* (meaning 'stink inside') – upper part of Hop Ranch Creek
- *p'uy'ám'* – village site up the Squamish River

CHEAKAMUS RIVER

Trails

- Important intercoastal trade route from Howe Sound to the Pemberton Valley passing through the Squamish and Cheakamus Valleys – still used in the early 1900s and even today as a trade route
- Trail leading east from Cheekeye to Alice Lake and Stump Lake and places north – know locally as "Christy's Trail" – used into the 1950s
- Trail to ritual bathing sites on Brohm River on the northeast side of the small bridge over the river
- Trail through the Cheakamus Canyon on the west side of the river – walked in the 1930s

Archeological Sites

- Obsidian source at Garibaldi
- Cambium scraping, bark gathering – throughout Squamish Nation territory
- Fish Weir site formerly on the Cheakamus River
- Culturally-modified cedar trees near salt shed
- Culturally-modified trees near Lucille Lake and Rubble Creek

Spiritual/ceremonial use sites

- Throughout Squamish Nation territory – individual access to areas of wilderness
- Numerous ritual bathing sites up the Cheakamus valley
- Rocks shaped by the Transformer – throughout the area
- Alice Lake – popular swimming lake for the Squamish Nation (still); cliff jumping
- Mount Garibaldi – traditional importance – canoes were anchored to it during the Great Flood; peak of Mount Garibaldi important in Squamish Nation oral tradition
- Cheekeye River several locations including under the bridge – rocks collected for sweathouses
- Brohm River near the small bridge, several hundred meters from the highway – ritual bathing,

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

cleansing rituals

- Brohm Ridge and Paradise Valley – sites for “grandfather” and “grandmother” rocks
- Small lake that lies near the south end of Brohm Lake – large lizards that were considered dangerous
- *wáwn̓ti* (meaning ‘looking out’) – rock bluff on the east side of the Cheakamus River – well known location in Squamish Nation mythology – Transformer story: caretaker of the Cheakamus River
- Areas not far east and west of the highway adjacent to Swift Creek – ritual bathing – for the past few years
- *Siyám’* – large rock at the lower entrance to the Cheakamus Canyon, in the middle of the river, that was the guardian of the canyon – transformer stone
- *t’ák’t’ak’múy’in t̓l’a in7iny’áxe7en* (meaning ‘landing place of the Thunderbird’) – “Black Tusk” – powerful being was believed to reside here and the Squamish Nation used to train for power in the area
- Callaghan Lakes –Squamish Nation people are said to have trained here for spiritual power
- Brandywine Falls – supernatural being was believed to reside there
- Section of the Sea to Sky Highway between Brandywine and Function Junction –Transformer site located on the south side of the highway, about a kilometer north of where Callaghan Creek crosses the highway, in an area where there are distinctive basalt rock formations

Fishing Sites

- Chum, coho and spring salmon harvest on both Squamish and Cheakamus Rivers
- Late coho fishing in Tenderfoot Lake
- Steelhead fishery on the Cheakamus River
- Fish weir formerly situated on the Cheakamus River
- Alice Lake – formerly a noted trout fishing lake
- Brohm River area not far east of the highway – salmon, pink, coho and sockeye (gaff hook), jig for steelhead in pools, harpoon steelhead in the 1930s
- Site where highway crosses the Cheekeye – steelhead fishing
- Cat Lake – cutthroat and rainbow trout
- Stump Lake – trout
- Brohm Lake – steelhead, cutthroat, rainbows, Dolly Varden and catfish – trout before and after it was stocked
- *wáwn̓ti* (meaning ‘looking out’) – rock bluff on the east side of the Cheakamus River – trout
- Swift Creek – steelhead, coho and Dolly Varden – until recent times
- Culliton Creek to a big pool below the falls – Dolly Varden, steelhead and cutthroat
- Vicinity of a large rock known as *siyám’* located somewhere at the lower entrance to the Cheakamus River Canyon
- Pools near the lower entrance to the Cheakamus Canyon – Dolly Varden, steelhead, trout – still fish this area
- Cheakamus river above the canyon – spring, steelhead and trout
- Cheakamus River above the canyon, just below the outlet of Daisy Lake – trout
- Brandywine Creek at the spot where it crosses the highway – trout
- Pools below Brandywine Falls – trout
- Small lake in the vicinity of Alpha Lake, Nita Lake (likely) - trout

Plant Harvesting

- Blueberry harvesting in the environs of upper Cheakamus River and Whistler area
- Cambium scraping, bark gathering – throughout Squamish Nation territory
- Areas around Whistler for blueberry and huckleberry harvesting

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Wooded area between the highway and Waiwakum I.R. 14 particularly around the water tower at the base of the bluffs – pine mushrooms
- Area from Squamish Valley north along the highway to Alice Lake – plants for food and medicine including salal berries, Oregon grape, pine mushrooms, chanterelles and other mushrooms
- Around Alice Lake – huckleberries and blueberries
- Brohm Ridge – collection of inner bark from cedars
- Around Stump Lake – berries
- Tiny lake just south from the lower end of Brohm Lake – Labrador tea
- Area southeast from the lower end of Brohm Lake, near the eastern side of the highway – good area to gather medicines: wild cherry, Oregon grape, and devil's club
- Small creek about 100 meters above the 1 km mark on the Forest Service road that leads up to Brohm Ridge – devil's club
- Branch of the Forest Service road to Brohm Ridge that leads to Cat Lake – wild cherry
- Short way up Brohm River from the highway near Cat Lake – plantain, Oregon grape, red willow, devil's club and other plants
- Above Cat Lake – cedar boughs and cedar bark
- High above Cat Lake – yellow cedar boughs and bark
- Cheakamus River east to Brohm Lake – red huckleberries
- Brohm Lake and Swift Creek lookout – huckleberries on either side of the highway
- Vicinity of Brohm Lake – cedar roots – still obtained here
- Above Brohm Lake and along the highway past the lake, up near the canyon– blackberries
- Around Brohm Lake – thimbleberries, blueberries, salal berries
- East side of highway north of Brohm Lake, in the area of Swift Creek – blueberries
- West and east side of the highway from Culliton Bridge to Conroy Bridge – huckleberries, salal berries, Oregon grape, blueberries and blackberries
- Culliton Creek east of the highway – morel mushrooms
- Near the salt sheds at the north end of the Cheakamus Canyon (north) – cedar bark and roots
- Along a creek near the salt sheds, east of the highway – “money plant”
- Entire region along the highway from Rubble Creek to the Pemberton Valley – contemporary commercial pine mushroom harvest
- Northwest side of Daisy Lake and east of the highway about one and a half kilometers north of Brandywine – pine mushrooms (personal and commercial)
- Along the highway between north Garibaldi and Brandywine – blueberries, huckleberries, salal berries
- Daisy Lake area – black and red huckleberries
- East side of the highway east of Brandywine and in an area to the east of the road where Dority Creek crosses the highway – blueberries
- South side of Dority Creek on the west side of the highway – blueberries, huckleberries and mushrooms
- Brandywine Creek, immediately west of the road, from the railway crossing to the Brandywine – high bush cranberries
- Area north of Brandywine, west of the highway all the way up to the top of a small mountain in the Callaghan Creek area – blueberries, cranberries, and huckleberries
- Area north of Brandywine, east of the highway – Labrador Tea
- Both sides of the Callaghan Lake Road – huckleberries and cedar bark
- Two miles south of Whistler – blueberries
- Just past the Whistler town site – low-bush blueberries
- Whistler vicinity, east of function junction towards Cheakamus Lake – cranberries, huckleberries, salmonberries, blueberries and pine mushrooms

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- From Whistler area to Black Tusk – pine mushrooms and berries
- Vicinity of Function Junction along the west side of the highway down to where the railway crosses – Blackcaps and cow parsnip
- Area south from Function Junction, in the hills above the area where the bridge crosses Cheakamus River flowing from Cheakamus Lake – blueberries – last picked here in 1978

Hunting Grounds

- Mountain Goat hunting/wool gathering by families camped at the mouth of the Cheakamus
- East side of the highway from a wooded area across from the Waiwakum I.R. 14 – deer and blue grouse
- Low mountain southwest of Alice Lake and east from the present-day highway – deer and blue grouse – regularly hunted until 1960s
- Alice Lake – flying squirrel
- Deer hunting in entire area north from the Cheekeye River all the way up to Brohm Lake and west to the Cheakamus River
- Entire Brohm Ridge area that is situated east of the present-day highway between the Cheekeye and Brohm Rivers – good hunting especially after the first snow – deer and goat
- Around Stump Lake – deer
- All around Brohm Lake to Culliton Creek – deer on lower ridges, mountain goat on higher ones
- South end of Brohm Lake – blue grouse
- Directly east of the highway from Brohm Lake – deer; grizzly bear sighted here
- Ridge not far from the east side of the highway northeast from the upper end of Brohm Lake – mountain goat
- Draw near *wáwnti* (meaning ‘looking out’) – rock bluff on the east side of the Cheakamus River – deer hunting east to Brohm Lake – major hunting area
- Area between Brohm Lake and Swift Creek and entire Brohm Lake area, especially along the ridge west of the highway that extends down to the Cheakamus River – deer, blue grouse, and moose
- Above Brohm Lake and along the highway past the lake, up near the canyon – bear
- West and east of highway north of Brohm Lake and south of Swift Creek – grouse and deer
- Area between Swift Creek and Culliton Creek not far west of the highway – deer, blue grouse
- Area between Swift Creek and Culliton Creek, east of the highway from the power line up into the ridges and low peaks – deer and bear
- North end of Brohm ridge and to the north and west of there in the small bluffs all the way to the summit – deer and goat
- Mount Garibaldi – mountain goats – hunted here in former times
- Area of ridges extending from the north side of Culliton Creek all the way up to a little lake that is west of the highway and north from the area where Conroy Creek crosses the highway – deer and grouse – area still in use
- North of Culliton Bridge, on the east side of the highway, between Culliton and Conroy Creeks – deer and grouse
- On the hillside at the southeast end of Daisy Lake – deer
- West side of the highway west of Pinecrest Lake and in the Brandywine area – deer
- Brandywine area – grouse and deer abundant
- Whistler area to Black Tusk – grouse
- Alta/Nita Lakes area – deer and grouse – hunted in the 1970’s
- North and west from Alpha Lake – former hunted deer in this area
- Northwest from the two tiny lakes located along the northwest side of the highway about 5 km southwest of Function Junction – deer hunting formerly

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Trap line sites

- Above Cat Lake
- From Swift Creek north to Culliton Creek, east to encompass Brohm Ridge and as far as Garibaldi Park, then south to and area just south of the Cheekeye and west to the confluence of the Cheekeye and Cheakamus Rivers, then north to the point of commencement below Culliton Creek following alongside the Cheakamus River but slightly to the east of it – still registered in 1993
- Along both sides of the Cheakamus River from its mouth all the way up to its headwaters and even as far as Green Lake – still used into the 1950s and 1960s
- Brandywine River and Brandywine Falls extending north to the area where Callaghan Creek Crosses the highway and south to the upper area of Daisy Lake – registered still in 1984
- Around Alpha and Nita Lakes – beaver – 1940s

Village Sites

- Winter village site stretched upstream from the mouth of the Cheakamus River

Locations of Traditionally-Named Places

- *syexwáyakalh* (meaning ‘urine under water’) – Brohm River
- *wáwn̓tí* (meaning ‘looking out’) – rock bluff on the east side of the Cheakamus River
- *nch’kay* (meaning ‘dirty place’) – Mount Garibaldi and Cheekeye River
- *siyám* – large rock at the lower entrance to the Cheakamus Canyon, in the middle of the river, that was the guardian of the canyon
- *t’ak’t’ak’múy’in tl’a in7iny’áxe7en* (meaning ‘landing place of the Thunderbird’) – name applied to the “Black Tusk”

2.5 The Duty to Consult and Accommodate – Summary of Legal Information

Consultation with First Nations and accommodation of First Nations' interests is required to avoid a breach of the fiduciary duty owed by the Crown to aboriginal peoples and to justify any infringement on aboriginal title and/or rights. In *Haida v. British Columbia (Minister of Forests)* (*Haida I*), the court explained that the Crown's obligation to consult with aboriginal peoples is rooted in the trust-like relationship between those parties, usually expressed as a fiduciary duty owed by the Crown to aboriginal peoples:

“The duty to consult and seek an accommodation ... stands on the broader fiduciary footing of the Crown's relationship with the Indian peoples who are under its protection.” (para 55)

In *Haida II*, it is further explained that:

“The fiduciary duty of the Crown, federal or provincial, is a duty to behave towards the Indian people with utmost good faith and to put the interests of the Indian people under the protection of the Crown so that, in cases of conflicting rights, the interests of the Indian people, to whom the fiduciary duty is owed, must not be subordinated by the Crown to competing interests of other persons to whom the Crown owes no fiduciary duty.” (para 62)

Under Canadian law, the Crown may be able to infringe aboriginal rights and title for substantial and compelling reasons, including economic and infrastructure development, if the Crown does so in a manner that can be justified as consistent with their fiduciary duty. Consultation and accommodation is required as part of that fiduciary duty whenever infringements to aboriginal rights or title are proposed and, as in this case, where a substantial claim to aboriginal rights or title exists. It is not necessary to have proven the rights or title in court or through the treaty process. Decisions from B.C.'s Court of Appeal confirm that the Crown's duty arising from their fiduciary relationship with aboriginal peoples includes a duty to consult about potential infringements of s. 35(1) rights before those rights have been proven in court or confirmed in a treaty. It should be noted that the courts have accepted that sufficient proof of rights to trigger the duty to consult and accommodate may come from the fact that the Crown has accepted a claim for the purposes of treaty negotiation and entered into a framework agreement.

It is also the law that, to be meaningful or genuine, consultation and accommodation must occur early in the planning stages of the project and not after any decisions have been essentially made. Consultation and accommodation must take place before an infringement of aboriginal rights or title occurs, if it is to form part of the justification for the infringement. There must be a genuine

intent to integrate First Nation's concerns with any proposal demonstrated. As well, the duty to consult, like the fiduciary duty of which it is an example, is a continuing duty.

Given the complex nature of aboriginal rights and title, and the organizational structure of aboriginal peoples, there can be difficult issues in terms of determining the proper party to be consulted. Overlapping title claims that are as yet unresolved need to be taken into account in determining which parties must be consulted with. Any aboriginal peoples whose rights will be infringed by a development must be consulted and their interests accommodated. The Sea to Sky Highway corridor, including the whole of the area of the highway upgrades between Horseshoe Bay and Whistler, is the claimed traditional territory of the Squamish Nation. There are overlapping interests for the Squamish Nation and Lil'wat Nations in the corridor between Rubble Creek and Whistler that will require consultation with both Nations.

Consultation and accommodation processes with First Nations must be one-to-one negotiations with Crown representatives and must be distinct processes. That is to say, public consultation processes will not suffice to meet the duty to consult and accommodate aboriginal interests. The consultation must be a meaningful process. Standard public consultation processes have been held to not meet the test for aboriginal consultation. The Crown has a duty to inform the First Nation parties of the manner in which their interests may be affected by developments. Funding will normally be required to meet the positive duty to fully inform an aboriginal group of a project and to fully inquire as to the First Nation rights and interests that will be impacted. The funding provided to produce this AIUS report is, in part, a fulfillment of that obligation.

2.6 Negotiating for Mitigation and Accommodation – Summary of Legal Information

Consultation and accommodation must be meaningful and address the concerns and interests of aboriginal peoples. A workable accommodation is required as an end result which may include jobs, business opportunities, the allocation of resources, mitigation, compensation and/or cultural and economic factors. In *Delgamuukw v. British Columbia*, it was held by the courts that the nature and scope of the duty of consultation will vary with the circumstances. In *Haida I*, the court held that the scope of the consultation and the strength of the obligation to seek accommodation will be proportional to the potential soundness of the claim for aboriginal title and aboriginal rights. The Crown bears the burden of proving that it engaged in meaningful consultations with aboriginal parties.

Consultation must, as the courts have defined it, substantially address First Nations' concerns, allocate the resource in a manner respectful of the priority of the aboriginal interests, carry with

it an obligation to seek accommodation, and be adequate and meaningful. In *Haida*, it is clear that there is an obligation on the Crown to seek an accommodation with regard to impacts on First Nations' interests. In *Haida II*, it was expressed in these terms:

“A declaration that the Crown provincial and Weyerhaeuser have ... a legally enforceable duty to the Haida people to consult with them in good faith and to endeavour to seek workable accommodations between the aboriginal interests of the Haida people on one hand and the short and long term objectives of the Crown and Weyerhaeuser ...” (paras 104, 129)

Consultation is more than establishing a process, it requires active steps to ensure accommodation that addresses the concerns of the aboriginal group in question and respects their interests. The Crown may justify its infringement of aboriginal interests where the following tests are met:

- the government has accommodated the exercise of the aboriginal right to participate in the industry;
- where a government has enacted a regulatory scheme which reflects the need to take into account the priority of aboriginal rights holders; and
- where the extent of participation in the industry of aboriginal rights holders is relative to their percentage of the population.

It is clear that compensation is relevant to the question of justifying infringements on aboriginal rights and title. In *Haida II*, the court put it this way:

“Compensation for damage to Haida title or rights should become a subject of negotiations”. (para 101)

Cultural interests and economic interests must be accommodated; this is clear from the *Delgamuukw* and *Haida* decisions. Consultation is about more than cultural matters. The courts have recognized that aboriginal title has an inescapable economic aspect.

Negotiations to ensure that there is an effective sharing of the economic options from development are a key aspect of the consultation and accommodation process. Any work must be carried out with a minimum infringement of the preferred way of First Nations to exercise their aboriginal title and aboriginal rights interests. Compensation for any damage to these interests should be a subject of negotiation. In *Haida II*, accommodation was seen as encompassing employing Haida people in forestry operations and sharing economic opportunities with the Haida people. A broad range of options to appropriately accommodate the

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

economic sharing options were articulated in this case, particularly the allocation of timber to the Haida, varying cut levels, employment opportunities and opportunities for subcontracting. Therefore, consultation requires a meaningful discussion of economic sharing as well as compensation for infringement. Possible approaches or arrangements might include:

- **Impact Avoidance**
 - Changes to the design of the proposed upgrades before construction
- **Protection and Preservation of Areas and Activities**
 - Land transfers
 - Land freezes
 - Access management
- **Enhancement**
 - Employment opportunities
 - Economic development opportunities
 - Cultural awareness
 - Environmental conditions
- **Compensation**
 - Financial compensation for losses or damages
 - Revenue sharing

3.0 A Brief History of Development in the Study Area

Early ethnographic evidence reveals a tremendous depopulation of the Squamish caused by smallpox beginning in the 1770s. It is estimated the Squamish population was halved by 1838-39. This devastation by disease changed sustenance patterns.

Historical documentation indicates that immigrants from throughout the world founded the Granville town site (later the City of Vancouver) amidst the Squamish Nation camps and villages that peppered Burrard Inlet. Still, for the first couple of decades of non-aboriginal settlement, the largest newcomer population continued to be at New Westminster, as Vancouver's explosive growth did not begin until 1886 (Macdonald 1992:18). An early settler, Charles Frederic Morrison of England, later recalled the solitude of Vancouver in 1863:

“[I]n 1863 Burrard Inlet, where Vancouver now stands, was a vast solitude. I an[d] a party of friends borrowed a whale boat in New Westminster and pulled down the North Arm of the Fraser around to the Narrows, up Burrard Inlet and so on to Port Moody and the only living beings we came across were an old Squamish Nation Indian and his wife fishing in a small canoe. No Vancouver, no sawmills, nothing” (Morrison n.d.:12).

Regardless of the town site's rate of growth, the Squamish Nation identified the imminent threat that settlement posed to their summer sites. By the late 1860s, alarmed at the rate of encroachment around their Burrard Inlet villages, and witnessing the loss of culturally-significant areas such as Jericho, Squamish Nation representatives requested Colonial officials to reserve certain permanent villages for their exclusive use. The Colonial government therefore recognized in 1869 a handful of traditionally-occupied Squamish Nation sites — those at False Creek, Capilano River, Mission Creek, Seymour River, and Burrardview — as being reserved for the aboriginal residents. These village sites, along with the Indian River fishery and additional village sites on the Squamish River and in Howe Sound, subsequently received confirmation as Squamish Indian Reserves by the Joint Indian Reserve Commission (JIRC), which began setting aside reserve sites in 1876 (see Kennedy 1995).

In the second half of the 19th century, year-round permanent settlement in Burrard Inlet increased substantially, and larger numbers of Squamish Nation people spent the winter residing on five small reserves in the Inlet where they could take advantage of emerging economic opportunities working as wage labourers, especially in the lumber camps and sawmills, and on the docks. Colonial officials granted considerable inducements to the new non-aboriginal entrepreneurs, providing them with extensive timber claims and low-cost land, some of which was already being occupied by Squamish Nation people. The surveyor who staked out a sawmill claim in

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Stanley Park, earlier marked as a Military Reserve, subsequently wrote to the Colonial Secretary and informed him that:

“referring to the Sketch appended it will be seen that the N.W. corner occurs in the centre of an Indian Village to clear which would only give the Saw Mill claim about 90 acres; by the appearance of the soil and debris this camping ground is one of the oldest in the Inlet. The resident Indians seemed very distrustful of my purpose and suspicious of encroachment on their premises” (Lauders 1865).

A 7 June 1865 report by Magistrate Chartres Brew accompanied the surveyor’s letter and contained the statement that: “a Squamish Indian called ‘Supple Jack’” and two of his male relatives were living on the land in question but that the mill owner had “no objection to their remaining where they are” (Brew 1865). Supple Jack’s stay, however, came to an end when the Joint Indian Reserve Commissioners (JIRC) failed to set this land aside as an Indian Reserve. A community of aboriginals and people of mixed ancestry remained in Stanley Park as “squatters,” but eventually the City forced them to relocate. Some found haven on Squamish Reserves.

In the late fall of 1876, the JIRC suggested to the Squamish Nation that their separated smaller reserves around Burrard Inlet might be consolidated into a single large reserve there, but the Squamish Nation opposed the recommendation. Soon, the impracticality of creating a large reserve, because of local settler opposition and prior land alienation, grew clear to the Commissioners as well. They dropped the matter entirely, although Commissioner G.M. Sproat commented that the chiefs “intimated to us, however, that they would expect large reserves on the Skwawmish [Squamish] river Howe Sound” (Sproat 1876). By this time, wrote Commissioner G.M. Sproat about the Burrard Inlet Reserves, they were “so hemmed in by the settlements, that it was seldom in our power to increase them in any way to useful purpose: for it was obviously bootless to do so by the addition of utterly worthless soil, which would only have shown a fallacious acreage on paper” (Sproat 1877). “Worthless” though the Burrard Inlet soil may have been — at least in Sproat’s view — the loss of this land to the future Squamish Nation economy has been enormous.

At Squamish the JIRC encountered a similar situation in that lands requested by the Squamish Nation were unavailable. The JIRC could allot only part of “Staw-a-mus Island,” also called “Skwawmish Island,” as its southern portion had already been pre-empted by a settler named Van Braemer, who desired the fields of hay growing there (Jemmett 1875; JIRC 1876). Nevertheless, the JIRC set aside an additional 18 Squamish Indian Reserves along the Squamish River from the river mouth up to *puy’ám’*, , the home of Chief Andrew, situated about 25 miles upstream.

Ever-increasing urban development in the cities of Vancouver and North Vancouver resulted in the gradual curtailment of the Squamish Nation people's ability to participate in many of the sustenance activities described in this report. By the 1950s, clams could no longer be harvested in Burrard Inlet, the main place where Squamish Nation people traditionally dug them, for the few that remained had become too polluted. Specific places to which the Squamish Nation once travelled for cutting timber for canoes and house planks had long since been clear cut or reserved as park land. The north shore berry patches disappeared as houses crept up the mountainside. Consequently, another change occurred in the Squamish Nation people's settlement and sustenance pattern — those who resided on Reserves in Burrard Inlet now travelled to Howe Sound and Squamish to dig clams, hunt, fish, harvest plant foods, and to find strength in the Squamish wilderness.

Development in the Squamish Valley began more slowly, partly because Squamish Nation canoes and other small watercraft initially provided the only transportation between Howe Sound and Burrard Inlet. The late Sadie Baker of Stawamus recalled that under sail, the canoe trip to Burrard Inlet took a full seven hours south, and as much as a day return. By the 1890s, nevertheless, a couple of dozen farmers growing fruit, hay and root crops, had cleared land in the Squamish Valley and, with the arrival of hop farmers a few years after, the Union Steamship began its once a week run between Burrard Inlet and Squamish to take agricultural products south to urban markets and holiday seekers north on their way to Daisy Lake. Construction of a rail line north proceeded slowly, with steamships linking the discontinuous track between Dundarave, in West Vancouver, and Squamish, until the government completed the Horseshoe Bay to Squamish section in 1949 (Armitage 1997:89-90, 116).

A full rail link between Squamish and North Vancouver was not completed until the 1950s when the Province, realizing that train service had become profitable, expanded the line beyond Horseshoe Bay. Along the route, rail line construction pushed aside or blasted apart a few rocks shaped by the Transformer at the beginning of time. The Sea to Sky Highway also had a sporadic beginning. In the 1930s, the government put to work unemployed labourers widening the road north from Britannia to Browning Lake, in Murrin Provincial Park, and a few years later the BC Electric opened a rough track as far as Squamish that became the base for the future Sea to Sky Highway, completed in 1958 (Armitage 1997:192-193).

With the highway open, settlers, tourists and businesses moved into the Squamish Valley and surrounding countryside. Major construction jobs also began in the late 1950s, first with the BC Electric's construction of an earth dam at Daisy Lake, in the north of Squamish Nation territory. A tunnel from the Cheakamus Dam at the south end of Daisy Lake carried water to a generating station on the Squamish River. The addition of an electrical substation built in the 1960s made possible operation of a ski-lift at Whistler Mountain, previously visited only by the most

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

adventuresome tourist, and soon tourism brought new demands for housing and related services (Armitage 1997:188, 218). Recreational needs around Whistler area then displaced traditional Squamish Nation sustenance pursuits, as new entrepreneurs bulldozed blueberry and huckleberry patches, and hikers, cross-country skiers, and ski-doers took up trails travelled by Squamish Nation hunters. In the Squamish Valley, the removal of first growth forest altered the landscape and the operation of sawmills brought an end to herring in Blind Channel, as well as a reduction of waterfowl.

Today, Squamish Nation territory is unusually varied, marked by urban development in the south, suffering from the effects of explosive growth in the central region around the yet-small town of Squamish, and experiencing significant changes in land use and occupancy in the northern reaches. Since the Squamish Nation people's first direct contact with Europeans in 1792, as reviewed briefly in this report, a constellation of external and internal factors has resulted in considerable transformations to the social, political and economic structures of aboriginal Squamish Nation society. Map 4 shows some of the current constraints to Squamish Nation use of their territory, both jurisdictional and physical, in the study area.

The current status of the territory is that it is a dramatically altered landscape. Industrial logging practices, mining, roads, rail lines and urban development are among the numerous impacts on the land and resources that constitute the Squamish Nation traditional territory. The current status of the land base in the territory drastically reduces the options available for different land use regimes. The Squamish are faced with significantly reduced opportunities and can really do no more than deal with what is left after decades of development. Choices the Squamish may have made years ago have been precluded, and many important areas have already been destroyed. For example, the choices for land use made in Xay Temixw reflect this situation; these choices are based on what is available today, not what the preferred land use choices of the Nation would have been with a less altered and degraded territory. These choices also reflect an intention to restore health to areas that have been degraded by industrial logging, pollution, erosion and other impacts of development.

The Sea to Sky Highway Upgrade Project must be seen within this context of development that has tremendously altered and degraded the land and resources of the traditional territory. These alterations have already significantly reduced the Squamish presence in, and use of, the traditional territory by precluding numerous options for land use that could have incorporated the Squamish perspective and protected Squamish Nation interests. The Sea to Sky Highway Upgrade Project is viewed as a further incremental loss to the Nation because of the increased access it will provide to the territory, the increased usage that will result and the concomitant impact on the territory, which will further negatively impact Squamish Nation interests.

4.0 Squamish Nation Socio-economic Profile

4.1 Community Profile

Current Land Base - Reserve Lands. The Squamish Nation has 23 reserves located in southwestern British Columbia including the North Shore of Burrard Inlet, Howe Sound and the Squamish Valley. Refer to Map 4 for reserve locations. These reserves are listed below by geographic area:

Table 1. Existing Squamish Nation Reserves

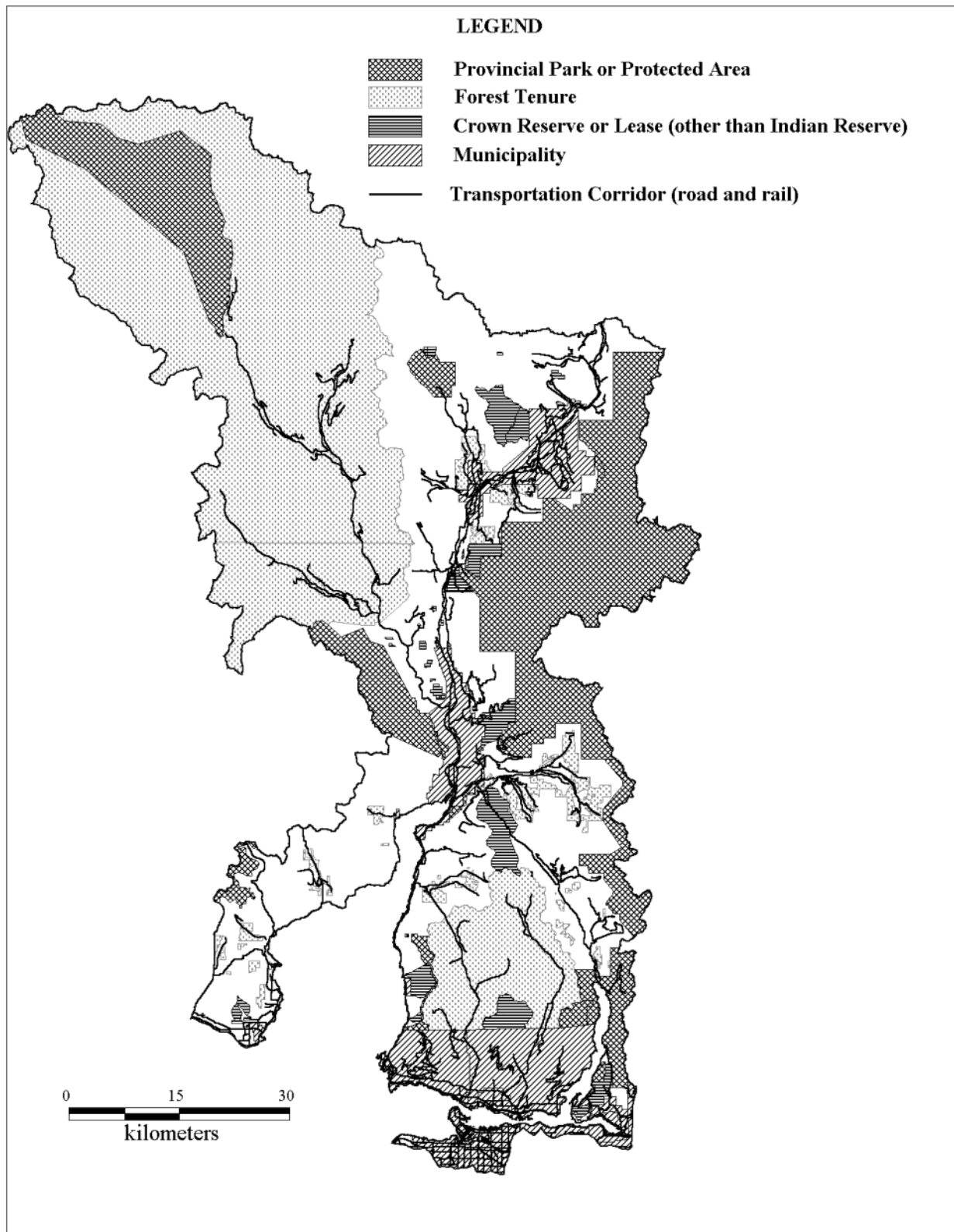
Geographic Location	Reserve Name	Reserve No.	Size (hectares)
North Shore	Mission	1	35.0
	Seymour Creek	2	34.6
	Capilano	5	155.7
Squamish Valley	Skowishin	7	29.6
	Chuckchuck	8	1.0
	Poyam	9	0.3
	Skowishin Graveyard	10	0.4
	Cheakamus	11	1,637.6
	Yookwitz	12	9.3
	Poquiosin and Skamain	13	45.2
	Waiwakum	14	15.0
	Aikwucks	15	11.3
	Seaichem	16	27.5
	Kowtain	17	20.8
	Yekwaupsum	18	2.0
	Yekwaupsum	19	1.0
	Stawamus	24	22.1
Howe Sound	Kaikalahun	25	11.5
	Chekwelp	26 / 26A	14.2
	Schaltuuch	27	0.2
	Defense Island	28	1.7
	Kwum Kwum	28A	6.2
Total		23 reserves	2,117.7 hectares

Source: Adapted from Squamish Nation 2002 Inventory Portfolio, supplemented with information from "Schedule of Indian Bands Reserves and Settlements," December 1992, which is subject to change with current re-surveys of reserve boundaries.

Of Squamish Nation's 23 reserves, only nine are populated with Squamish Nation communities. A number of the reserves are unpopulated due to their limited size and/or lack of access. In addition, some reserves are leased for non-Squamish Nation use (such as the Squamish Nation

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Map 4. General Constraints on Squamish Nation Land Use in the Study Area



village of *ch'kw'elhp*, known as Chekwelp I.R. No.26/26A), or are the site of a former Squamish Nation cemetery (such as *skawshn*, Skowishin I.R. No. 7).

Generally, the Squamish Nation membership is divided into two main geographic areas centered on the North Shore of Burrard Inlet (Capilano, Mission and Seymour Creek) and in the Squamish Valley. Fourteen of the existing Squamish Nation reserves are located in the general geographic area of the Squamish River Valley. Six of these reserves are the site of Squamish Nation communities: Cheakamus (*ch'iyákmesh*), Waiwakum (*wiwk'm*), Kowtain (*kaw'tín'*), Yekwaupsum (*yekw'ápsm*), Seaichem (*siyích'm*), and Stawamus (*st'ám'es*).

While Squamish Nation appears to have vast land resources for their people with more than 2,000 hectares of reserve land, much of the land on the North Shore of Burrard Inlet has already been developed for urban use, and in the Squamish Valley is considered undevelopable for community use as a result of a variety of environmental constraints. One of the most significant constraints is flood risk from the Squamish River or its tributaries. All of the Squamish valley reserves are located within the floodplain of the Squamish River or its tributaries. While some dyking has occurred over the years, it is understood that existing dyking does not meet current 200-year design flood protection standards for all of the reserves. In addition, Squamish Nation communities, such as the Cheekye community on Cheakamus is faced with additional constraints – Cheekye lies within the pathway of the Cheekye Fan Hazard Area and is subject to debris floods and conventional flooding from the Cheakamus/Cheekye River. With the exception of Cheakamus, the existing communities of the Nation in the Squamish Valley have developed to the point that only modest increases in population can be expected to be accommodated within flood protected areas, where road access and urban utility services are available. Cheakamus has some development potential; however, it is currently limited due to geotechnical hazards and the lack of utility servicing.

Adjacent Lands to Reserve. Squamish Nation reserves in the Squamish Valley are surrounded by lands under the jurisdiction of the municipality of the District of Squamish, and in the northern reaches of the Squamish Valley, the Squamish-Lillooet Regional District (SLRD) surrounds Cheakamus. As local representative bodies of the Government of British Columbia, the District of Squamish and SLRD operations are governed by legislation contained in the *Local Government Act*. Under the *Local Government Act*, the District of Squamish and the SLRD can enact land use plans and zoning bylaws to regulate land use and activity in their jurisdiction adjacent to reserve boundaries.

4.2 Social Profile

Total Membership. As of June 2002, total Squamish Nation membership was 3,159 members. This is a 25% increase (over 600 members) in 10 years since 1993, when total Squamish Nation membership was 2,520. Membership in 2002 is almost evenly split between those living on-reserve (1,546) and those living off-Reserve (1,613).

Membership Distribution. Total Squamish Nation membership, including on and off reserve membership, for 2002 is summarized below in Table 2.

Table 2. Squamish Nation Total Membership, 2002

Location	No. of Members
On reserve	1,546 (49%)
Off reserve	1,613 (51%)
Total	3,159 (100%)

(Source: Squamish Nation, Membership Department, 2002)

While the majority of on-reserve members (over 1,260) live on one of three reserves located on the North Shore, close to 300 members and their families, representing about 20% of on-reserve population live on reserve in the Squamish Valley. This represents 1 in 5 Squamish Nation members.

The following observations can be made from the geographic distribution of members:

- Squamish Nation members live on only nine of 23 reserves including: Mission (known as *slha7án'*), Seymour Creek (*ch'ích'elxwi7kw*), and Capilano River (*xwmełch'stn*) on the North Shore, and Cheakamus (*ch'iyákmesh*) Waiwakum (*wiwk'm*), Kowtain (*kaw'tín'*), Yekwapsum (*yekw'ápsm*), Seaichem (*siyích'm*), and Stawamus (*st'ám'es*) in the Squamish Valley.
- There are no Squamish Nation members living on any of the Reserves in the Howe Sound/Sunshine Coast area.
- Of the Squamish Nation members living on-reserve, about 20% live on reserve in the Squamish Valley. Waiwakum (103 members) remains the most populated and Yekwaupsum (27 members) the least populated of the Squamish Valley reserves.
- Cheakamus and Stawamus have seen the greatest increase over the past 10 years within the Squamish Valley

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Age Group Profile. A profile of Squamish Nation membership by age groups is provided below:

Table 3. Age Group Profile

Age Group	Off-Reserve	On-Reserve	No. of members	% Total Population
0-4	132	118	250	7.9%
5-9	155	132	287	9.1%
10-14	148	174	322	10.2%
15-19	125	191	316	10.0%
20-24	159	121	280	8.9%
25-29	130	80	210	6.6%
30-34	157	75	232	7.3%
35-39	158	106	264	8.4%
40-44	132	151	283	9.0%
45-49	104	110	214	6.8%
50-54	62	91	153	4.8%
55-59	56	58	114	3.6%
60-64	34	38	72	2.3%
65-69	24	35	59	1.9%
70-74	17	29	46	1.5%
75-79	8	17	25	0.8%
80-84	6	13	19	0.6%
85-89	4	3	7	0.2%
90-94	2	4	6	0.2%
	1,613	1,546	3,159	100.0%

(Source: Squamish Nation, Inventory Portfolio, 2002.)

The following characteristics can be noted from the age distribution of all Squamish Nation members:

- Membership of the Squamish Nation is characterized by young age groups, specifically, pre-school and school aged children from birth to 14 years;
- About 27% of the total Squamish Nation membership is under 15 years - more than one in every 4 Squamish Nation members – this compares with about 19% for the total BC population in 2001 (Source: Statistics Canada, 2001 Census);
- Membership in the Nation continues to be dominated by youth; the percentage of Squamish Nation membership under 15 has not changed since 1993;
- There is a high number of adults in the child bearing years (20 to 34 years) – almost 23%; this, and larger family sizes will tend to maintain relatively high future growth rates for the Nation. The percentage of membership in the child-bearing years has not changed since 1993;
- The percentage of members 60 years or over has increased slightly since 1993 and higher life expectancy will create a growing portion of elders in the coming years;

- However, currently, only 5.2% of the total membership is 65 years or over compared with 13.2% for the BC population in 2001 (Source Statistics Canada 2001).

A youthful population dominates the Squamish Nation, like most aboriginal populations – more than 1 in every 3 members is 19 years of age or under (37.2% of total membership). This is in stark contrast with the Canadian non-aboriginal population, where 1 in 5 individuals are under 19 (24.9%). Equally significant is the small proportion of Squamish Nation membership in older age groups – over the age of 65. Only 5.2% of the Squamish Nation population is over the age of 65 – compared with 12.1% of the Canadian population.

The youthful population base of the Squamish Nation will have significant implications as this population age group matures into working years, marries, has children and requires on-reserve housing and other community amenities. While the Canadian non-aboriginal population will be aging into retirement years over the next 10 to 20 years, the membership will be aging into primary working age groups of their 20's, 30's and 40's.

5.0 Archaeological and Heritage Site Impacts

The archaeological record on the southern coast of British Columbia spans the last 10,500 years BP (before present). This 10,500-year time span is divided into a number of periods what archaeologist term “phases.” A “phase” is a segment of time and in the archaeological record that also covers a geographic area where the types of sites, the artifacts and features in those sites are similar, essentially dividing time into periods when and where cultural change occurred. Along the southern coast of B.C. the cultural historical sequence is divided into five sections;

- | | |
|-------------------|-----------------|
| ➤ Old Cordilleran | 10,500-5,500 BP |
| ➤ Charles Culture | 5,500-3,500 BP |
| ➤ Locarno Beach | 3,500-2,500 BP |
| ➤ Marpole | 2,500-1,000 BP |
| ➤ Late | 1,000-200 BP |

While it is beyond the focus of this report to discuss the age of all sites in Squamish Nation Traditional Territory (this has been discussed in Reimer n.d.), several sites are assigned to all the phases of the southern BC coast cultural historical sequence. Examples of site types of different ages will be discussed in sequence demonstrating the continuity of Squamish Nation occupation.

Old Cordilleran. Sites DIRs 5 (/Mt. Garibaldi/Brohm Ridge), EaRt 3 (Squamish/ Cheakamus River Divide), DiRu 5 (Coquitlam Lake), and EaRu 5 (Russet Lake, east of Whistler) can all be attributed to this time period.

Charles Culture. Examples of sites are EaRr 2 (transformer rocks and pictograph panel near Whistler), DkRs 3 (*wáwnti*) and DkRs 3 (near *syexwa’y’akelh*) (transformer rocks in the Cheakamus River valley) and DIRt 1 (rock art panel upper Squamish River Valley). Lithic scatter sites (EaRt 2,4,5) in alpine contexts along the Squamish Cheakamus River divide (Pu’yam) also date from this time. Village or camp sites in the Ashlu River Valley/Creek Valley, known as *yelhíxw* (DIRt 2), a site at Stawamus (*st’ám’es*, DkRs 6) and North Vancouver (Eslahan) (DiRt 1 and DhRs 16) and rock shelter sites in the Ashlu Creek (*nepítl’*)(DIRt 8) and Elaho (EaRu 5) River valleys dates also date to this time.

Locarno Beach. Archaeological sites EaRs1 and 2, and EaRt 1 (lithic scatters) are associated with this period, as are the rock shelter (DkRs 10) located near the Stawamus Chief Mountain, and a shell midden site (DiRt 3) in Alberta Bay, known as *kél’etstn*.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Marpole. Some of the sites that can be dated to this archaeological phase include the following: DiRt 4, 5, 6, (lithic scatters), DiRt 7 (shell midden), DjRt 1 (shell midden), DiRt 9 (lithic scatter at Porteau Cove, xwáw'chayay) , DkRs 4 (burial ground), DkRs 7 (cache pits), DkRs 12 (lithic scatter, on Waiwakum I.R. No. 14), DLRs 3 (sub-alpine berry drying trench), DLRs 4 (lithic scatter), and an isolated artifact found at DLRs 6, Black Tusk Meadow.

Late - Present. Several sites dating to the past 1,000- 200 years BP exist in Squamish Nation traditional territory, and numerous CMT sites offer evidence of the wide scale use of timber resources in the past and recently. Examples include CMT and trail sites at Nelson Creek, Deeks Creek, Porteau Cove, Kallahne Creek, Cheakamus River, Rubble Creek, Brandywine Creek, Callaghan Creek, and Function Junction.

Extent of Archaeological Surveys in the Study Area. Recent industrial and residential developments throughout Squamish Nation traditional territory have resulted in the completion of several Archaeological Overview Assessments, Archaeological Impact Assessments, mitigative excavations and salvage operations. The benefit of these projects has been an increase in knowledge of the archaeological record, although sites have been destroyed by development activities.

An assessment of the state of archaeological knowledge in the Squamish Forest District was undertaken in 1996 as part of Equinox Research's evaluation of archaeological overviews, assessments, and reviews conducted in British Columbia from 1993-1996. This study reviewed how well the Squamish District is known archaeologically and included an assessment of the effectiveness of methodologies employed by previous studies. Equinox determined that the Squamish Forest District Archaeological Overview Assessment, as of 1996, had only 0.06% of its land base surveyed for archaeological sites. Furthermore, they found that most projects completed in this region have focused on areas very close to water sources, at low elevation, in valley bottom contexts, and only in the southern parts of the Forest District, known to be Squamish Nation traditional territory.

In addition to the biases in research designs of AOA and AIA level projects, the degree of previous impacts on the archaeological record of Squamish Nation traditional territory cannot be dismissed. Extensive logging, road, highway and rail construction, residential expansion, hydro facilities and recreational activity have all contributed to fragmenting the land base and the archaeological record within it. Numerous areas along the Sea to Sky Highway corridor have been impacted by these previous developments, resulting in the low number of archaeological finds. A review of archaeological and ethnographic documents revealed that many more cultural

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

and heritage sites used to exist along the Sea to Sky Highway corridor, but have been altered and or destroyed by development.

While numerous projects have been undertaken since 1996, the percentage of survey coverage in this region has only increased a slight amount; hence, it is very likely that many more archaeological sites throughout Squamish Nation traditional territory have yet to be recorded. The state of archaeological research within Squamish Nation traditional territory is still at only a preliminary level.

Impact Description. Proposed work to be completed during the highway upgrades will consist of a variety of highway improvements including road widening, new road construction, straightening of curves, culvert replacement, and bridge improvements. Ancillary developments will include staging areas for equipment, gravel borrow areas, and the construction of access roads to temporary detour routes. Land-altering development activities that could impact archaeological sites include blasting, leveling and grading, machine excavation, vegetation removal/clearing and grubbing, and heavy equipment traffic.

Sixteen areas of inferred archaeological site potential in proximity to the highway corridor were inspected by project archaeologists (Table 4 and Table 5). No archaeological sites were identified as being in direct conflict with the proposed project impacts. Two archaeological sites were identified in proximity to the proposed project corridor. These sites include one isolated find (Site Cheakamus T-1) and one pictograph (Site Browning T-1). Both sites could pre-date 1846, and therefore would be automatically protected under the *British Columbia Heritage Conservation Act* (HCA). Table 6 summarizes the field results for each site. At this time, it is not expected that either of the sites will be directly impacted by the proposed highway improvements, but indirect impacts could occur. Indirect impacts are defined as adverse effects that do not result specifically from project activities, but which are nevertheless induced by the project.

Four heritage sites with culturally modified tree have been identified within or near the alignment corridor. Tree ring counts of increment bore cores taken from a sample of the trees have indicated that none of them pre-date 1846. While these sites are not automatically protected under the HCA, they should be considered as traditional use sites. These sites are summarized in Table 7.

The field crew also examined three trails during the course of their inspections. None of the trails was recorded as archaeological site, but they are of concern to the Squamish Nation as heritage areas.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 4.
Horseshoe Bay to Squamish: Areas of Archaeological Investigation and Results

Area #	MoT Drawing No.	General Location	Station or other descriptor	Moderate to High Potential Features	Action	Results
1	1 & 2	Nelson Creek	100+159 – 101 +860	CMTs	Inspected. CMTs recorded and dated	6 post-1846 CMTs recorded
2	9 & 10	Brunswick Beach	113+324 along rail to 114+600 Tunnel Point	Midden, other coastal sites	Inspected for sites. No shovel testing needed	No sites identified
3	11 & 12	Loggers/Deeks Creek	116+600 – 117+300 and up Deeks Ck., road to rail connections	CMTs, habitation sites	Inspected for CMTs. No shovel testing needed.	Trail identified adjacent to Deeks Ck.
4	15	Kallahne Creek Bertram Creek	Road to rail connection 121+900 – 122+500	Habitation sites	Inspected for habitation sites. No shovel testing needed.	Trail and 5 post-1846 CMTs identified
5	15 & 16	Porteau Cove	Rail line (~ 1 km) 122+500 - 122+600 on shoreline and beach	Midden, coastal or other habitation sites	Inspected for sites.	No new sites
6	16	Porteau Staging areas	124+400 – 124+700	Habitation, midden, rock art, trail	Inspected for sites, rock art, and trails.	Trail at staging area
7	20 & 21	Britannia Bypass	130+400 – 132+200	Habitation sites; Glacial outwash terrace	Inspected for sites. No shovel testing needed.	No sites identified
8	23	Browning Lake	134 +900 – 135+600	Habitation sites, trails, rock art sites	Inspected for sites. No shovel testing needed.	Pictograph identified Browning 1
9	26	Shannon Creek	139+893 – 140+300	Habitation sites; Paleo shoreline	Inspected for sites. No shovel testing required.	No sites identified
10	27 & 28	IR 24 Bypass	141+900 – 142+800	Habitation sites; Glacial outwash terrace	Inspect and shovel test	On hold. Not yet inspected.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 5.
Squamish to Whistler: Areas of Archaeological Investigation and Results

Area #	MoT Drawing No.	General Location	Station or other descriptor	Potential (moderate to high)	Action	Results
11	14 & 15	Cheakamus River	Staging area 229+100 -229+300 Lucille Lake	Habitation sites	Inspected. No shovel testing needed.	69 post-1846 CMTs identified
12	15 & 16	Cheakamus River	229+300 - 231+500	Habitation sites, CMTs	Shovel testing completed.	Isolated find identified
13	17	Rubble Creek	231+500 – 232+900	Habitation sites, burial site, CMTs	Inspected. No shovel testing needed.	2 post-1846 CMTs identified
14	18	Daisy Lake Bridge	234+520 -234+840	Habitation sites	Inspected. No shovel testing needed.	No sites identified
15	24	Callaghan Creek	Staging area 344+800 – 245+000	Habitation sites	Inspected shovel tested.	No sites identified
16	27 & 28	Millar Ck/Function Junction	Staging area, 249+860 – 250+600	Habitation sites, Burial sites	Inspected, shovel test, possible GPR	No sites identified. Caution

Table 6.
Summary of Protected Archaeological Site Information

Temporary Site Number	Site Type	Heritage Significance	Potential Impact
Cheakamus T-1	Isolated Artifact	Low	None identified
Browning T-1	Pictograph	High	Possible vandalism. Possible impacts from rock climbers. Possible cultural expropriation.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 7.
Summary of Post-1846 Heritage Site Information

Site Location	Site Type	Significance	Potential Impact
Nelson Creek Larson Creek	Culturally Modified Trees	High cultural significance	Destruction by road construction
Deeks Creek	Trail	High cultural significance	Increased recreational use. Temporary loss of access through proposed staging area and construction activities at parking/pull-out site.
Bertram Creek	Culturally Modified Trees and Trail	High cultural significance	No impacts identified.
Porteau Unnamed Creek (24.6 km Creek)	Trail	High cultural significance	Increased recreational use. Temporary loss of use through construction staging and closure of pull-out.
Cheakamus	Culturally Modified Trees	High cultural significance	Destruction through clearing and grubbing. Reduced access due to loss of parking/pullout.
Rubble	Culturally Modified Trees	High cultural significance	Destruction through clearing.
Function Junction	Culturally Modified Tree	High cultural significance	None identified.

Mitigation Opportunities. Mitigation measures should be made in consultation with the respective First Nations, but should include the following measures:

- Retain a Squamish Nation archaeologist to monitor construction activities and provide direction when archaeological and heritage sites are impacted.
- Avoid clearing of cedar groves as these trees are particularly valuable to Squamish members, where cedar groves cannot be avoided, locate and protect alternate cedar groves for Squamish Nation use.
- Prior to disturbance of culturally modified trees, allow Squamish members to harvest valuable materials

6.0 Nation Impacts

6.1 Social and Economic Inequalities

Impact Description. Increased development of lands and resources as a result of the Sea to Sky Highway Upgrade Project will continue to create social and economic inequalities for Squamish Nation members. While the municipalities of Squamish, Whistler and Pemberton have enjoyed increased economic prosperity over the years with the development of Whistler as a world class resort and general economic growth within the corridor, Squamish Nation members have not historically benefited. Squamish Nation members believe that there is a considerable income disparity and social marginalization between Squamish Nation members and the non-aboriginal community, and that this will continue. As land values continue to rise and more people are attracted to the Sea to Sky Corridor area due to the presence of the existing highway and the proposed upgrades, closing the income gap will become a more significant challenge for the Squamish Nation people.

A review of Statistics Canada information from recent Census years indicates that neither employment/labour force nor income data is available for all Squamish Nation Reserves². However, the Department of Indian Affairs, with Statistics Canada data, does provide some information on income for aboriginal and non-aboriginal populations residing on and off reserves, across Canada and by province for the year 1995. Figures available indicate that for British Columbia, the average employment income for the non-aboriginal population is \$27,761 while for aboriginals it is \$17,959. A comparison of average incomes for on and off reserve aboriginals across the province indicates that individuals living off the reserve have incomes almost 30% higher than those on the reserve, reflecting the increased economic opportunities available outside the reserve.

Similarly, the unemployment rate for aboriginals is 2.7 times that of the non-aboriginal population of BC, at 25% compared to 9% respectively. The situation is worse for on reserve aboriginals, where unemployment rates of 29% are experienced. Indeed, for the Waiwakum Reserve for which unemployment rate figures were available, the rate is comparable at 28.6%. We have assumed that this income and economic disparity demonstrated provincially and on the Waiwakum Reserve are similar to that experienced by Squamish Nation members and non-aboriginals in the Squamish area.

² In order to maintain confidentiality, Census data is not reported for small sample sizes, such as represented by Squamish reserves.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

The impact of continued economic disparity will be higher costs associated with poverty including higher social assistance, health, and education costs. Research into the costs of First Nation poverty in Canada (Fiscal Realities 2001) shows that aboriginal people tend to be poorer than other Canadians and therefore tend to consume more public services. This trend results in:

- Higher costs in four relatively large expenditure areas: health care costs are 65% higher; social service costs are 194% higher, basic education costs are 111% higher and costs associated with the protection of people and property are 49% higher.³
- Higher program costs (on average \$6,382 higher) for Aboriginal persons than non-Aboriginals, a sixty percent cost differential.
- Reduced levels of health. There is a strong relationship between good health and income. Studies show that in Canada, the richest one-fifth of the population has substantially better health than the poorest one-fifth (Osberg 1990:33). It stands to reason then that First Nation health would be on average below the Canadian average and thus drive costs upwards.
- A lower life expectancy among Aboriginals in comparison to non-aboriginals. According to a human development index study completed by the DIAND, First Nations have a life expectancy 8 years lower than other Canadians and have higher incidences of many diseases.

The Squamish Nation has been working to create employment opportunities on its lands so that members have better chances to participate in the market economy. Evidence supporting this view can be seen on the three North Shore reserves: Seymour Creek (*ch'ich'elxwi7kw*), Mission (*slha7án'*), and Capilano River (*xwmelch'stn*) where commercial activity is occurring. Economic interests are not confined to existing reserves, though; other opportunities are being explored throughout the Xay Temixw to encourage economic opportunities for membership.

Fiscal inequalities also exist, in that the Squamish Nation does not benefit from local development in the same way that other governments benefit. The SEIA (2003) report identified that governments would generate approximately \$183 million (Table 8) during the construction phase of the proposed highway upgrades. Based upon the projected population growth it is possible to estimate the tax revenue that governments will generate once the proposed highway upgrades are complete at approximately \$95 million annually (Table 9). Squamish Nation has a strong interest and a right in sharing the revenues that are generated on Xay Temixw.

³ Based on data developed by the Royal Commission on Aboriginal Peoples that has been updated to account for inflation and population growth.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 8.

Estimated Government Revenue - Construction Phase

Phase	Government	Revenue source	Total Revenue (\$ million)
Construction	Federal	federal personal income tax	
		federal sales tax	
			102
	Provincial	provincial personal income tax	
		provincial sales tax	
		school tax	
		resource revenues	
			75
	Municipal	real property tax	
		development cost charges	
		fees and charges	
			6
Total			183

Source: Adapted from KPMG, SEIA Volume I, Section 7.1.4, page 111.

Table 9.

Estimated Government Revenue - Operations Phase

Phase	Government	Revenue source	Total Revenue per year (\$)	Average revenue per capita (BC)
Operation	Federal	income taxes	40,306,140	3,780
		consumption taxes	13,552,673	1,271
		other taxes	159,945	15
	Provincial	income tax	18,020,470	1,690
		consumption tax	15,770,577	1,479
		property and related taxes	5,459,456	512
		other taxes	1,546,135	145
		resource revenues	-	
	Municipal	taxes	501,161	47
		development cost charges	-	
		fees and charges	-	
	Total		95,316,557	8,939

The Squamish Nation government has a standing mandate to generate revenue so that it can provide improved programs, services and infrastructure to its membership in the form of education, social assistance, or land and resource management. Improved infrastructure may take

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

the form of roads, water and sewer systems, housing, and community use buildings such as the gymnasiums at Capilano or Stawamus, or the new school that is being built at Capilano.

There are precedents for First Nations sharing revenue with other governments including: federal sales tax room, provincial sales tax room, federal personal income tax room, and real property tax (both the local and school tax portions).

Mitigation Opportunities. While the change in income disparity between aboriginal and non-aboriginal populations due to the highway upgrades cannot be predicted, it is clear that the aboriginal population has not generally benefited from past highway construction and other induced economic development in the same ways that other residents and governments have benefited. Without directed intervention, the socio-economic disparities between aboriginal and non-aboriginal populations cannot be expected to change.

Reducing the economic disparity between Squamish Nation and non-Squamish Nation people in the study area is a complex issue that requires:

- Economic development opportunities on Squamish Nation lands;
- Resolution of a treaty which would enable the Squamish Nation to acquire an adequate land and resource base; and,
- An improved fiscal relationship among the Squamish Nation, the provincial government and the federal government. Such a relationship would provide the Squamish Nation with expanded revenue options and better define service responsibilities of all orders of government.

Specific mitigation options include:

- Training and employment of Squamish Nation members for highway construction and maintenance.
- Long term contracts performing highway maintenance.
- Provision of direct and safe highway access to commercially developable land on Squamish Nation reserves.
- Establish revenue sharing agreements among Squamish Nation and other governments.

6.2 Disruption of Significant Sites and Areas

Impact Description. The Sea to Sky Highway currently “runs up the backbone” of Squamish Nation territory, and therefore is in close proximity to numerous culturally-significant sites and areas. Many of these sites and areas have already sustained a high level of impact from the existing highway and associated induced impacts (such as increased development and tourism). The proposed highway upgrades will add to those impacts. Interviews and field visits with Squamish Nation members have identified a number of significant sites and areas that will be impacted by the proposed upgrades, and documented some of the concerns expressed by Squamish Nation members.

Each of the important sites and areas may be impacted differently by the proposed upgrades - the usefulness of some sites may be diminished, others may be compromised enough that Squamish Nation members will no longer use them, or overcrowding by non-native recreationists may drive game away or decrease privacy at spiritual sites. Future recreational trips for the Sea to Sky Highway corridor, consisting of recreational trips of Lower Mainland residents and non-resident tourism trips, are forecast to reach 4.5 million per annum by or before the year 2025, an increase of 40% to 50% over current levels. Park and forest recreation site visitation for facilities adjacent to or accessible via the Highway account for approximately 42% of total recreational trips. Of those trips not destined for provincial parks and forest recreational sites, the remaining could be representative of the number of backcountry visitors. Importantly, mitigation measures recommended by MoT consultants (Confluence Environmental Consulting, 2002) for recreation impacts caused by the proposed upgrades are at odds with Squamish Nation needs for restricting back-country access.

The increased market trend towards outdoor recreation and ecotourism are indicative of the growth of this segment of recreational trips. Given the location of several popular provincial parks within the region including Murrin Park, Porteau Cove, Shannon Falls, and Stawamus Mountain Chief, the extensive network of trails for hiking and mountain biking, the high quality of rock climbing routes, as well as increased interest in ecotourism, the visitor volumes for the region will continue increasing over time.

The following discussion summarizes the nature of aboriginal and contemporary Squamish Nation activities in each of the highway sections and reviews the potential impacts upon these activities, as identified by Squamish Nation members. A more thorough list of traditional and contemporary activities that have been reported for the Sea to Sky Highway corridor can be found in Section 2.4:

Section PA1: Nelson Creek/Horseshoe Bay to Sunset Beach. Within this section of the highway, the Squamish Nation identified, by the application of Squamish language place names, three areas of specific cultural significance. Activities formerly occurring in this highway section included hunting, fishing, ritual bathing, and camping. As well, a pictograph site can be found within this highway section. Though Squamish Nation people no longer fish in Nelson Creek (or hunt in its upper reaches), they are concerned about potential degradation of the chum salmon spawning habitat. Chum are highly valued by the Squamish Nation, as this species is the best for smoke-drying. It is also believed that construction of a tunnel through the mountain at Nelson Creek may scare deer away from this area.

Section PA2: Sunset Beach to Lions Bay. Aboriginal travellers formerly used a fresh-water drinking source in this area. Additionally, Squamish Nation women picked berries at one location within this highway section, and Squamish Nation men accessed the mountain goat hunting grounds near the Lions by way of creeks within section PA2. No impacts to Squamish cultural practices have been identified.

Section PA3: Lions Bay to Loggers Creek. Considerable numbers of deer and mountain goat are known to be in the hills east of the highway. Squamish Nation hunters are concerned about the long-term effects of increased traffic on the game population. A family memorial exists at the highway and M Creek, marking the site of an accident that claimed a number of lives. The memorial may have to be moved, in consultation with family members.

Section PA4: Loggers Creek to Kallahne Creek.

Deeks Creek has long been a place where aboriginal spirit dancers have gone for purposes of ritual bathing and purification. Squamish Nation dancers' use of Deeks Creek for ritual bathing has already been hindered by non-aboriginal hikers' use of the same area. Apart from interfering with private ritual bathing, hikers are thought responsible for ceremonial costumes being removed, after these items had been placed in what was regarded as a ritually "clean" place. It is believed that increased recreational use may force the Squamish Nation to abandon this area entirely.

This section of the highway is known for the hunting that is possible on the benches above the road. Highway expansion will likely affect the lower reaches of trails used for access into these deer and goat hunting areas east of the highway. Deer populations are believed to be healthy in this area and therefore Squamish Nation hunters have concerns about their future well-being, especially considering the increased traffic resulting from the highway upgrades.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

The Squamish Nation has an interest in acquiring land in the Porteau Cove area. There is concern that the proposed upgrades may affect slope stability in the area, particularly in association with Kallahne Creek, and lands of interest may be less safe or no longer suitable for development.

Section PA5: Kallahne Creek to Furry Creek. This area immediately to the east of this section of the highway has been among the most important winter deer hunting grounds for Squamish Nation hunters living in North Vancouver. Several trails have been identified in this area that lead from highway pull-offs into the hills immediately east of the highway. Thus, Squamish Nation people have general concerns about the impact of the highway on the game population in this area.

The ritual bathing areas along Furry Creek are expected to be further impacted as more people establish residences in the Furry Creek development. While the one bathing site near the golf course is usable for the moment, increased use of the course means that the dancers will possibly relocate their ritual bathing activities.

Section PA6: Furry Creek to Minaty Bay. Not too far north of the mouth of Furry Creek is the site known as *xel'xelés*, meaning 'painted face,' where two sets of pictographs are located. Although the proposed new highway upgrades will not impact directly upon the pictograph sites, care must be taken that the highway does not facilitate additional access to the sites.

Section PA7: Minaty Bay to Murrin Park. No direct impacts on the Squamish Nation use of this section have been identified. While this area was formerly known for its fishing, hunting and camping sites, the Britannia Beach area has suffered from effects of mining for a century and is an area of serious environmental degradation.

Section PA8: Murrin Park to South Stawamus. Browning Lake in Murrin Provincial Park is located immediately adjacent to the west side of the present-day Sea to Sky Highway, east of Watts Point. This lake is a special place to the Squamish Nation. Although no Squamish name is known today for Browning Lake, Squamish Nation tradition tells how it was connected to Howe Sound by an "underground passage". Dogfish were believed to swim from Howe Sound up to this lake and "spawn" there; hence, it was said to have been possible to catch small dogfish in Browning Lake. Interviewees heard or were told that seals also moved between Howe Sound and the Lake, and that occasionally kelp could be seen in Browning Lake (believed to be a bad omen). One interviewee mentioned that a double-headed snake was associated with this lake. Another Squamish Nation man commented that when swimming here "you can feel a suction in this lake". Squamish Nation elders used to comment on the large numbers of owls around this lake — as these owls were associated with the spirits of their ancestors they called the lake "sacred." Others have identified this lake as "mysterious" or "bad." Browning Lake is thus

regarded as having special qualities that are dependent upon retention of the lake in its original form.

Section PA9: South Stawamus to Centennial Way. This section incorporates an area of intense traditional and contemporary use by the Squamish Nation people. While hunting has been restricted within this section of the highway for many years, considerable fishing takes place here. Squamish Nation people are very concerned about the impact of the present highway construction on spawning streams in this area, especially since the initial construction of the highway is said to have destroyed a channel of the Stawamus River where salmon spawned. They also anticipate that increased development in the town of Squamish will impact the fisheries by introducing more toxic substances into the river system. It was reported that certain species and runs have already disappeared from the Squamish and Stawamus River systems due to environmental degradation. Ritual bathing sites on Stawamus Creek require protection.

Section PA10: Centennial Way to Depot Road. In this section, the Sea to Sky Highway continues to run more-or-less parallel to the Squamish River. This part of the Squamish Valley contains areas of intense traditional use and occupation by the Squamish Nation people, as well as areas of considerable contemporary use. Since 1876, several Indian Reserves have been allocated on the Squamish River within this section, and continue to be occupied by Squamish Nation members. At least two traditional villages located along the river here were completely eroded by the changing course of the Squamish River.

The Mamquam River as well as several creeks draining into the east bank of the Squamish River within this section of the highway corridor comprise major salmon spawning channels. Squamish Nation members have voiced concern about the effects of road construction on these streams. They are also concerned about long-term impacts that a significantly-increased population in the valley will have generally on the fish runs, and about how chemicals they believe are being used during the present-day construction of a golf course not far from the highway will impact salmon runs.

Section PA11: Depot Road to Brohm Lake. The Sea to Sky Highway continues northeast in this section, with the Squamish River taking a turn to the northwest. This section continues the area of intense traditional occupation by Squamish Nation members. There are two Squamish Indian Reserves here that continue to be occupied today. Activities occurring traditionally in this area include extensive fishing, hunting, trapping and plant gathering.

The current influx of tourists is already having a significant impact on Squamish Nation members' use of this section of this highway. In the summer, it is difficult to find parking around Alice Lake. Tourists and locals, including Squamish Nation members, fish trout here, and some

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

believe that the trout fishing has decreased. The rise in traffic volume is now affecting Squamish Nation use of the ritual bathing area on Brohm Creek, as not only is there more noise, but more people are exploring the secondary roads. Moreover, as these side roads are improved to carry the extra traffic, some culturally-significant plant species are being removed.

It is a concern of Squamish Nation members that highway construction may impact the steelhead fishery in this area. While some fishing done here may be “out of season,” it is a significant resource for Squamish Nation fishermen.

Section PA12: Brohm Lake to Culliton Creek. While some deer and grouse hunting continues in this section of the highway, recreational use is gradually displacing Squamish Nation hunters from this area. Nevertheless, Squamish Nation hunters are concerned that access roads to hunting grounds be maintained, especially around the northwest side of Culliton Bridge. As this section of the highway contains some of the best hunting grounds within Squamish Nation territory, hunters are uneasy about the effect of increased traffic and noise on the game population.

Already the recreational use of Brohm Lake is considered to be too much for the size of the lake, and especially, for its parking lot. Squamish Nation people fear that more tourists will impact their enjoyment of this summer swimming spot as well as impact the trout fishery.

It is anticipated that after the highway upgrading the Swift Creek area will no longer be appropriate for Squamish Nation people’s ritual practices, due to the increased noise. Inasmuch as ceremonial costumes have been left in this area, Squamish Nation people would not like to see hiking trails constructed along this creek.

Section PA13: Culliton Creek to Cheakamus Canyon. This area is known primarily to the Squamish as an important deer and grouse hunting area, and a place to fish steelhead and trout. Yet game in this section of the highway has already been impacted by heavy vehicle traffic, and Squamish Nation hunters fear that the proposed highway upgrading will have serious consequences for those animals that remain. Many Squamish Nation hunters believe that the highway upgrading will mean that hunting may not survive in this area.

The area north from the salt-shed where Squamish Nation women have obtained cedar bark should be checked for culturally-modified trees, especially if any timber is to be removed from this area as part of the highway upgrading.

Though fewer Squamish Nation people are currently trapping, there is a concern for the well being of fur bearing animals in this area, some of which have already suffered from the effects of logging and other uses such as recreation (snowmobiling, hiking) and mining.

Section PA14: Cheakamus Canyon North to North Garibaldi. This rugged section of traditional Squamish territory has been important to Squamish Nation members for its food resources and for the historic and culturally significant trail through to the Pemberton Valley. Recreational use in this area is rapidly displacing Squamish Nation hunters and gatherers. Squamish Nation members anticipate that this trend will continue and they will probably be excluded from practising any traditional, or commercial, sustenance activities that are not compatible with recreational activities. One possible exception is the picking of pine mushrooms, although it is anticipated there will be much more competition for this resource.

Section PA15: North Garibaldi to Brandywine. Squamish Nation members have used this upper area for trout fishing, deer and grouse hunting, and plant harvesting. Squamish Nation use of native plant foods in this area is being impacted by tourism, as more people visit this area and compete with aboriginal people for the indigenous crops. Those Squamish Nation people who still pick wild berries are also concerned about what they believe is an escalating use of pesticides along the Sea to Sky Highway and adjacent roads in this region.

Section PA16: Brandywine to Function Junction. Though this section of the Sea to Sky Highway was once an important food gathering area for Squamish Nation members, much of this activity has ceased due to intensive recreational development in this area, especially in the area south of Whistler, around Alta, Nita, and Alpha Lakes and extending south to Function Junction and beyond. Squamish Nation men seldom hunt now in this region. Moreover, Squamish Nation people report that very little gathering of berries and other plants is now done close to the Sea to Sky Highway, with the advent of chemical spraying along the roadsides; they fear this will continue. It is anticipated that additional housing and services in this region will curtail even further the possibilities for future uses of this area for traditional Squamish Nation activities. Squamish Nation members are also concerned that increased population in the Whistler area and south will further impact the health of the Cheakamus and Squamish Rivers.

Mitigation Opportunities. Potential mitigation opportunities vary depending on the site or area. The following mitigation opportunities and examples of suitable sites and areas provide an initial guideline.

- Protection through land acquisition or access management:
 - Pictographs at Sunset Marina
 - Deeks Creek ritual bathing site
 - Furry Creek ritual bathing site
 - Pictographs near Furry Creek
 - Brohm Creek ritual bathing site

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Swift Creek ritual bathing site
Stawamus Creek ritual bathing site

- Ensure Squamish Nation members are included in the development of access management plans:
 - Hunting area in the hills east of the highway between Lions Bay and Loggers Creek
 - Trails near Deeks Creek (Andrew Natrall's trail)
 - Deer hunting areas between Kallahne Creek and Furry Creek
 - Hunting areas between Brohm Lake and Cheakamus Canyon
 - Trapping areas between Murrin Park and South Stawamus
- Ensure Squamish Nation members are included in the development of habitat mitigation strategies to ensure protection of fishing and hunting activities:
 - Stawamus River
 - Mamquam River
 - Mamquam Blind Channel
 - Brohm River (steelheads)
 - Important game habitat areas
- Acquisition or co-management of provincial parks:
 - Porteau Cove
 - Alice Lake
 - Brohm Lake
 - Murrin Lake
 - Shannon Falls
 - Brandywine
- Protect through land acquisition or access management, and protect from contamination by weed control activities:
 - Pine mushroom picking areas (between Cheakamus Canyon and North Garibaldi, northwest side of Daisy Lake)
 - Berry picking areas along the highway between North Garibaldi and Brandywine
- Special Sites:
 - George family memorial at M Creek – if the site is disturbed, a permanent marker should be constructed, with the family's input
 - Land in the Porteau Cove area – land stability assessments should be conducted to ensure construction does not impact the safety of land downslope

7.0 Land Impacts

7.1 Land Availability and Value

Impact Description. The Squamish Nation's interest in acquiring land in the territory will occur in the face of increasing competition for land from non-native populations. According to the Socio-Economic Impact Assessment (SEIA), 2003, future population in the Sea to Sky Highway corridor will grow from approximately 33,000 today to just over 64,000 by the year 2025. With the proposed upgrades, improved travel time and safety will encourage an additional 11,800 people to settle in the corridor, for a total estimated population of approximately 75,800 (SEIA 2003 : 11, A5).

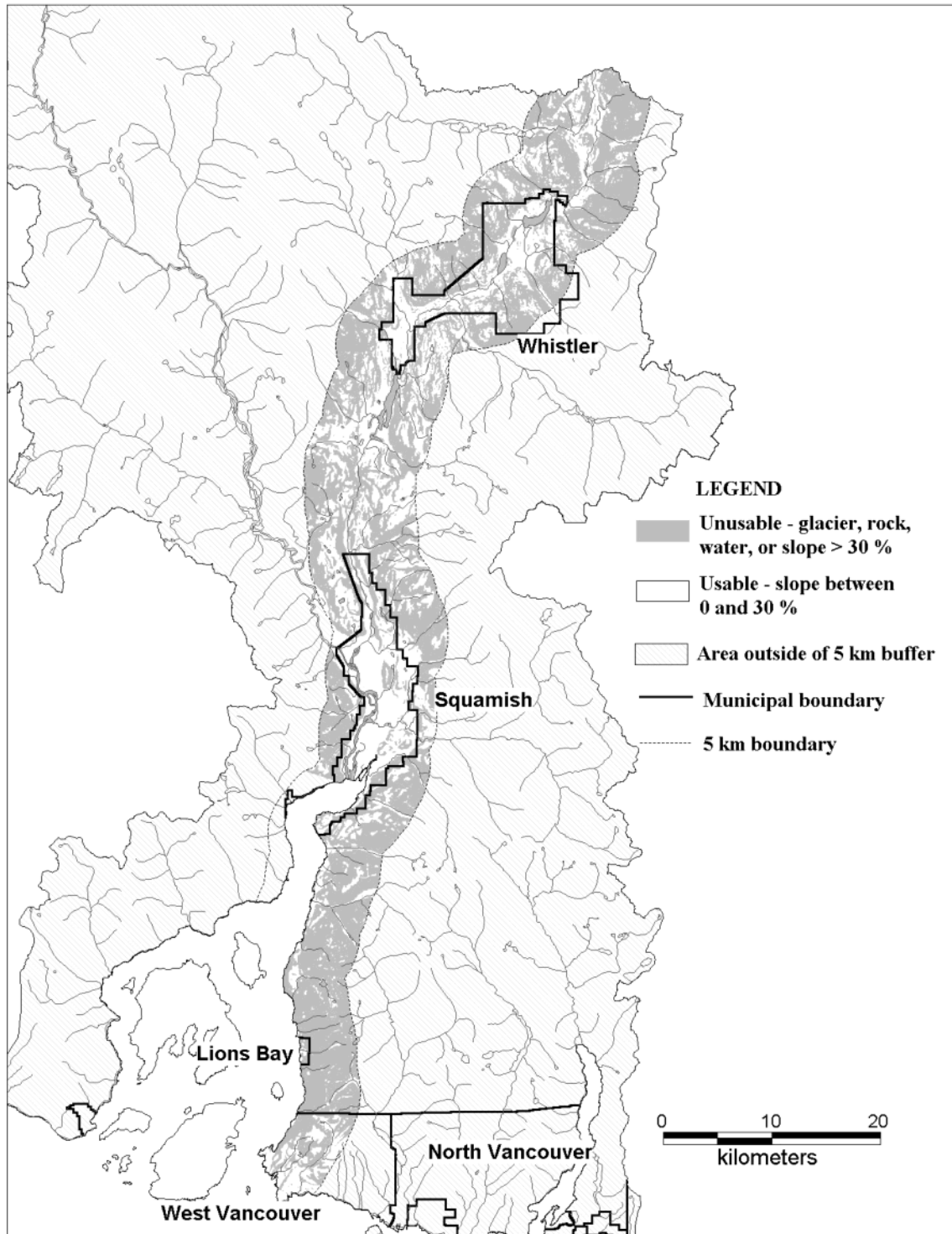
Competition for land will cause several impacts on Squamish Nation interests. As land is taken up by non-native populations, fewer areas of suitable land will be available for residential development or for satisfying agreements already reached by the Squamish Nation and other governments and industry. The cost of land is expected to rise with demand, and the increasing cost of land will reduce the amount of land the Squamish Nation can purchase in their territory once a treaty is reached (in potentially 5 to 10 years).

Both the supply of available land for development and the demand for developable land have been estimated for this study.

Land Supply. A simple GIS analysis was performed to identify generally developable lands in the highway corridor (defined as a buffer 5 km wide on either side of the existing highway from Horseshoe Bay to Pemberton). Lands with a slope of more than 30 percent were considered to be undevelopable, and land areas classified as ice fields, avalanche chutes, and water were considered to be unusable. Of the 111,260 ha included in the 5 km buffer, approximately 33 percent is inside a municipal boundary. Interestingly, of the land inside municipal boundaries, 60 percent is usable and developable, while outside of municipal boundaries, only 33 percent is usable and developable. Of the area outside municipal boundaries that is considered usable and developable (28,016 ha), only 5,800 hectares have a slope of 10 percent or less (considered a premium). Ownership, accessibility and geotechnical hazard areas were not considered in the analysis, but would further reduce the amount of potentially developable land. Map 5 shows areas considered usable and developable within 5 km of the highway. Table 10 presents a summary of the results. Analysis methods and assumptions are presented in Appendix A.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION - SEA to SKY HIGHWAY UPGRADE PROJECT

Map 5. Usability and Slope of Land within 5 kilometres of the Sea to Sky Highway



SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 10. Development Potential of Land in Proximity to the Sea to Sky Highway

Land inside Municipal Boundaries*		
Land Type	Area (hectares)	Percent
Useable and developable	15,063	60
Useable but undevelopable (high slope)	9,596	38
Unusable (ice, water, etc.)	505	2
Total	25,165	100

Land outside Municipal Boundaries		
Land Type	Area (hectares)	Percent
Useable and developable	28,016	33
Useable but undevelopable (high slope)	51,815	60
Unusable (ice, water, etc.)	6,262	7
Total	86,095	100

*includes parts or all of West Vancouver, Lions Bay, Squamish, Whistler, and Pemberton
 Source: Westland Resource Group

Squamish Nation Demand for Land. There are currently approximately 2,118 ha of land held in Squamish Nation reserves, but little land is left on reserves that are suitable for residential or economic development. To meet future land needs, the Squamish Nation will have to acquire new land outside of reserves.

There are severe housing shortages on reserve lands. At a 2.5% growth rate, membership in the Squamish Nation is forecast to be over 5,500 members by 2025⁴. Approximately 800 housing units are required now⁵, and an additional 700 housing units will be needed to accommodate future population growth – a total of 1,500 new housing units by the year 2025. Land for other community facilities such as parks, as well as the infrastructure to support a community (roads, etc.) also will be required. Assuming that some residential development will occur as infill on existing reserves, that the amount of additional land for services, facilities, and roads is equivalent to 30 percent of the residential land base, and that residential development off reserve will occur at the rate of 7.5 units per hectare, it is estimated that an additional 224 hectares of land will be required to meet the Squamish Nation housing needs. Analysis details are included in Appendix B.

4. SEIA (2003) uses an average annual growth rate of 2.7 percent for forecasting population to 2025.

5 Current housing needs do not include members who are single and without children.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Non-Native Demand. The SEIA infers that the incorporated municipalities and other communities in the Squamish- Lillooet Regional District will absorb the future population growth. Existing Official Community Plans (OCPs) for communities in the corridor have designated insufficient land to accommodate the additional population. It is estimated that if all OCPs remain as they are today, 14,600 of the forecasted future population for the corridor communities cannot be accommodated given the residential area and density shown in the OCPs. This figure coincides closely with the additional population attributed to the effects of the proposed highway upgrades. Approximately 993 hectares of land outside of current community boundaries would be required to house the additional population. Analysis details are included in Appendix C.

Changes to OCPs would be required to accommodate the additional population associated with the highway upgrades. Densities in existing communities would have to be increased, including the lifting of the development cap adopted by Whistler, or municipal boundaries would have to be expanded to accommodate the future population. It is unknown when or how OCPs may be changed, or what effects those changes might have on development patterns in the corridor.

Improved access will also induce non-residential development in the corridor (SEIA 2003 “ 137-138). An example of such development that may occur outside municipal boundaries, and in the traditional territory of the Squamish Nation, is the proposed Garibaldi Resort, approximately 13 km north of Squamish at Brohm Ridge. While not significantly advanced, according to the SEIA “the proposal contains plans for twenty chair lifts ..., 2,350 dwelling units, 1,500 room hotel, and 6,500 square meters of commercial space. The number of proposed units will far exceed existing residential units in many surrounding communities” (SEIA, page 49). A review of the resort developer’s website (www.jackjohnson.com), indicates that the resort is planned for “7,900 acres (about 3,200 hectares) of land along the Brohm Ridge outside of Squamish.”

Another example of future development within District of Squamish boundaries on land that may have been used to accommodate population growth resulting from the highway upgrades is the proposed Sea to Sky University. The STS University is earmarked for a 240-acre (about 97 hectares) site. Plans include academic buildings, faculty housing, cultural and recreational facilities, and commercial facilities.

Current Land Values. An examination of average assessed value per hectare in the District of Squamish was used to estimate the potential cost of acquiring land to accommodate Squamish Nation needs now and in the future. The District of Squamish total assessed values for land was divided by the total area to determine the average assessed land value per hectare. This estimate of average assessed land value per hectare takes into account assessed values of undeveloped and

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

developed land. The average assessed land value per hectare was then multiplied by the number of hectares required by the Squamish Nation.

Given that Squamish Nation requires 224 hectares for housing, the value of acquiring the land today would be approximately \$15 million (Table 11).

Table 11. Estimated Value of Land Required by Squamish Nation for Housing

Value per hectare approach - Squamish Nation land acquisition requirements to 2025		Units
Land required for Squamish Nation residential use by 2025	224	hectares
2001 District of Squamish total area assessed for taxation	10,853	hectares
2003 Total assessed land value	716,062,456	\$
District of Squamish average assessed land value per hectare	65,978	\$/hectare
Average assessed value of 224 hectares of land in the District of Squamish	14,779,139	\$

It is extremely difficult to predict the difference between the current value of land requirements and the value of land once the highway upgrades are complete. This would involve estimates over a long timeframe that may not be reliable. Analysis of aggregate assessed values and number of folios has been conducted and it is apparent that land values have been rising in the District of Squamish, Squamish Rural, Whistler, and Pemberton during the last 5 years. This trend does not seem likely to subside given the proposed highway upgrades. Mitigation opportunities include:

- Provision of land for community development
- Institute a freeze on Crown Land privatization and tenure until Squamish Nation needs are met

7.2 Direct Loss or Isolation of Land

Impact Description. Of all Squamish Nation reserve lands, only Stawamus (IR No. 24) will be impacted by the acquisition of new right-of-way for the upgraded highway. Two upgrade options are being considered: an upgrade of the existing highway through Stawamus; and a bypass route east of the existing reserve at the base of the Stawamus Chief Mountain. Given the Nation's

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

limited land base at Stawamus, the requirement for any additional land on IR No. 24 for highway upgrades could severely limit the economic development potential on reserve.

The amount of land required for the two options was identified in SEIA (2003) are 0.7 ha to upgrade the existing corridor or 3.0 ha for the easterly realignment, not all of which would come from IR No. 24.

The amount of right of way required should be considered preliminary because the location of the existing highway road pavement within the established, legal right of way has not been determined. Mapping provided by Natural Resources Canada showing reserve boundaries and the locations of right-of-ways across IR No. 24 presents conflicting and confusing information. The existing Sea to Sky Highway and Valley Drive roadways do not appear to be contained within the right-of-ways. MoT studied improvements to the Sea to Sky Highway in their report entitled “Sea to Sky Highway Alternate Routes Analysis Vancouver to Squamish and Corridor Improvement Analysis Squamish to Cache Creek – Draft, June 2001.” The report states “For either the Capilano option, or the upgrading of the Sea to Sky Highway, there must be resolution and agreement on the status of the Sea to Sky Highway through Stawamus IR No. 24 at Squamish. The right-of-way at this location is currently only Section 4, and is under dispute.”

While there may be direct loss of reserve land, there will also be increased impacts on the usability of reserve land. The existing highway, consisting of 2 lanes through IR No. 24, currently isolates portions of the reserve, particularly the 2-hectare site north of Valley Drive. The upgrade to 4 lanes will only increase the isolation of this area. According to a “Development Opportunities Analysis” prepared for the Squamish Nation in 1993 a two-hectare site with no physical constraints can accommodate 5,000 to 6000, square meters of commercial space. Commercial development of this highly visible site would require safe and convenient vehicle access directly from the highway or from Valley Drive.

Mitigation Opportunities. Recommendations for mitigation include:

- Provision of an alternate development site along the Sea to Sky Highway for economic development
- A legal surveyor is retained to conduct a title search of documentation of right-of-ways that impact IR No. 24.
- A legal plan be prepared that defines the locations of the existing right-of-ways on IR No. 24.
- The right-of-ways be posted in the field and the amount of the road encroachment onto IR No. 24 land be determined.
- Compensation for the existing encroachment

7.3 Direct Loss of Resources

Impact Description. Removal of resources for additional right of way and clearing resulting from the proposed upgrades will impact aboriginal use of and title to those resources.

Ethnographic research undertaken for this study indicates that there are still numerous locations for plant gathering, trout fishing and hunting in locations in close proximity to the highway. The use of these locations is dependent upon maintaining the integrity of the natural habitat.

Aboriginal rights and title have been summarized in section 2 of this study, and are also explicit in the United Nation Convention on Biological Diversity (United Nations, 1992). Signed and ratified by Canada in 1992, the Convention states that the Contracting Parties (in this case, the government of Canada):

“Recogniz[e] the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components” (United Nations, 1992:1)

and that:

“Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices” (United Nations, 1992:6)

While most animals of interest to Squamish Nation members are mobile enough to avoid injury or death due to clearing and grubbing, there are many plants of interest that may be impacted. Areas cleared for highway upgrades will include plant species of importance to First Nations for food (i.e. berry picking), materials used in making implements and ceremonial items, and for medicinal purposes. Some of the plants of interest to Squamish Nation members that are known to occur in proximity to the highway corridor are described in Table 12. Other key resources that will be removed for the highway upgrades include merchantable timber and rock.

The SEIA (2003) states that approximately 47 hectares of land along the corridor will be required for new right-of-way. This may change as the highway design is refined. Of the 47 hectares, 9.3 hectares of Crown lands and 0.7 hectares of reserve land required for highway upgrades that contain resources of interest to Squamish Nation. In addition to land required for

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

new right-of-way, land will be temporarily cleared to provide for working areas and material staging areas near the highway during construction. It is estimated that between 114.2 and 139.6 hectares of natural habitat along the corridor will be lost to clearing and grubbing associated with the upgrades, depending on which route options are selected (estimates provided by MoT).

Volume of rock removed for highway construction

MoT has indicated that the amount of surplus rock will likely be less than 1.5 million cubic metres. During the detailed design phase, efforts to eliminate or minimize rock cuts throughout the project will be made. A determination of available surplus will also be calculated at this time.

The average price in 1999 for processed shot rock in the Lower Mainland was \$7.52 per tonne, and \$5.02 per tonne for natural aggregates. Due to high capital and operating costs, construction of a processing plant on-site is not considered viable. Excess aggregate material may be stockpiled to meet projected shortfalls, or sold locally unprocessed. The Squamish Nation has expressed an interest in acquiring this material. Current market prices of rock should be used to estimate value once volume is determined.

Plants of Interest. Exact volumes of specific plants that will be removed during construction or lost permanently to new right-of-way is not yet known as the upgrade designs are still in a preliminary stage. Nonetheless, many of the plant species found in the corridor have market values (Tables 13 and 14).

Volume of merchantable timber lost due to clearing for construction and operation. It is not clear the volume of timber that will be removed although it is assumed that some portion of 139.6 hectares of land required to be cleared for the highway upgrades and identified as “natural habitat” will include merchantable timber. Market prices for various types of timber are listed in Table 15. for illustrative purposes, but since these prices are subject to fluctuation current market prices should be used to identify the value of timber once a volume is identified and removed.

Mitigation Opportunities. The following measures are suggested for mitigation:

- Provide access to timber to be removed and/or employment in logging operations
- Provide access to the plants to be removed during clearing and grubbing
- Provide access to rock removed for development on First Nations lands, including rock required for dyke improvements and other flood proofing measures
- Provide financial compensation for loss of resources

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 12. Selected Plants of Interest in the Highway Corridor

Plant	Squamish Name	Uses
<u>Spiny-wood fern</u> (<i>Dryopteris austriaca</i>)	<i>ts'ékwa7</i>	Roots roasted and eaten
<u>Sword fern</u> (<i>Polystichum munitum</i>)	<i>tsxálem</i>	Roots steamed and eaten, fronds used for basket cover and on berry drying racks, headdresses for ceremonial purposes
<u>Bracken fern</u> (<i>Pteridium aquilinum</i>)	<i>sxwútl'ekw</i>	Roots roasted and eaten, ceremonial uses
<u>Western red cedar</u> (<i>Thuja plicata</i>)	<i>xápay'ay</i>	most important tree to the traditional Squamish Nation economy – ropes, canoes, canoe bailers, boards and shakes, fire-drills, barbecue sticks, spreader sticks, toys, bowls and platters, herring rakes, storage boxes, rattles, inner bark softened and used for wrappers, diapers, clothing, boughs used for camping mattresses
<u>Douglas-fir</u> (<i>Pseudotsuga menziesii</i>)	<i>ch'shay'</i>	Poles used for harpoons, gaffhooks, dipnets and sea-urchin nets, canoe poles, bark used for fuel, medicines, ceremonial uses, sap used for chewing gum
<u>Western hemlock</u> (<i>Tsuga heterophylla</i>)	<i>kway'tsay</i>	Medicinal and ceremonial uses, boughs used to collect herring spawn
<u>Skunk cabbage</u> (<i>Lysichiton americanus</i>)	<i>ch'úukw'a</i>	Medicinal uses primarily
<u>Cat-tail</u> (<i>Typha latifolia</i> L.)	<i>sts'á7kin</i>	Very important economically – used to make mats of various sizes, thread, occasional hats, caps and shelters which shed water effectively
<u>Vine maple</u> (<i>Acer circinatum</i> Pursh)	<i>t'ekt'káy'</i>	Bows, needles, barbecue sticks, frame for sea urchin nets, dip nets for smelt, medicinal uses
<u>Broad-leaved maple</u> (<i>Acer macrophyllum</i>)	<i>k'emk'emel'áy'</i>	Best source of wood for paddles, also used for carving spindle whorls, bark beaters, mat creasers, smoke for fish curing, medicinal uses
<u>Devil's club</u> (<i>Oplopanax horridus</i>)	<i>ch'átiyay'</i>	Medicinal uses, ceremonial uses
<u>Oregon grape</u> (<i>Berberis aquifolium</i> and <i>Berberis nervosa</i>)	<i>séliy'ay</i>	Medicinal uses, food
<u>Red alder</u> (<i>Alnus rubra</i> Bong.)	<i>kwlúl7ay</i>	Food, dye, carved dishes, smoke for fish and meat drying
<u>Red elderberry</u> (<i>Sambucus racemosa</i> L.)	<i>sts'iwk'</i>	Food (specially preserved for winter use), carved toys, medicinal uses.
<u>High-bush cranberry</u> (<i>Viburnum edule</i>)	<i>kwú7kwuwel'say'</i>	Food
<u>Salal</u> (<i>Gaultheria shallon</i>)	<i>t'áka7ay</i>	Food (berries), medicinal uses, ceremonial uses
<u>Labrador or “swamp” tea</u> (<i>Ledum groenlandicum</i> Oeder)	<i>mákwam</i> tea	Beverage
<u>Alaska blueberry</u> (<i>Vaccinium alaskaense</i>)	<i>iy'álkp</i>	Food
<u>Red huckleberry</u> (<i>Vaccinium parvifolium</i>)	<i>skw'ekwchs</i>	Food
<u>Cascara</u> (<i>Rhamnus purshiana</i>)	<i>xexep'shínay'</i>	Medicinal uses
<u>Bitter cherry</u> <i>Prunus emarginata</i>	<i>t'elem'áy'</i>	Bark used for basketry, bindings, medicinal uses
<u>Salmonberry</u> (<i>Rubus spectabilis</i> Pursh)	<i>yetwán</i>	Food, medicinal uses

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 13. Value and Quantity of Imported Fresh and Chilled Mushrooms to Japan, 1993-1995. Value in billions of constant 1990 Canadian dollars; volume in metric tones (in parenthesis).

Species	1993	1994	1995
Pine mushrooms (<i>Tricholoma spp.</i>)	107 (19,443)	155 (3622)	162 (4993)
Shiitake (<i>Lentinula edodes</i>)	75 (15,586)	84 (24316)	77 (26308)
Truffles (<i>Tuber spp.</i>)	2 (4)	2 (5)	3 (5)
All others	2	2 (655)	3 (572)

Source: Adapted from “Cognetics International Research Inc. “An Economic Strategy to Develop Non-Timber Forest Products and Services in British Columbia” Forest Renewal BC Project No. PA97538-ORE. March 15, 1999. (Original reported in Japanese yen; above shown in Canadian dollars, converted at 124 yen to 1 dollar).

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 14.

Selected BC Indigenous Medicinal Plants for Wildcrafting and Sales into the North American and European Markets, and July 1998 Wholesale Prices		
Name	Wholesale Price dried	(\$Can/lb.),
Alder Bark (<i>Alnus rubra</i>)		\$3.00-\$5.00
Alum root (<i>Heuchera yllindrica</i>)		\$12.45
Avens (<i>Geum macrophyllum</i>)		\$12.00
Arnica (<i>Arnica latifolia</i>)		\$9.95
Baneberry (<i>Actea rubra</i>)		\$12.00
Bittercherry bark (<i>Prunus marginata</i>)		\$18.00
Bittersweet (<i>Solanum dulcamera</i>)		\$12.00
Bleeding Heart root (<i>Dicentra formosa</i>)		\$11.00
Bloodroot (<i>Sanguisorba candens</i>)		\$39.95
Burdock (<i>Arctium minus</i>)		\$7.45-\$14.30
Bunchberry (<i>Cornus canadensis</i>)		\$12.00
Cattail pollen (<i>Typha latifolia</i>)		\$80.00
Cascara sagrada (<i>Mentha citrata</i>)		\$11.95
Cedar Oil (<i>Thuja plicata</i>)		\$8.00-\$60.00
Chickweed (<i>Stellaria media</i>)		\$8.75
Chokecherry (<i>Prunus virginiana</i>)		\$23.00
Club Moss (<i>Lycopodium</i>)		\$10.95
Colt's Foot (<i>Petasites palmatus</i>)		\$26.00
Dandelion (<i>Taraxum officinale</i>)		\$6.00-\$10.00
Devil's Club (<i>Oplopanx horridus</i>)		\$30.00-\$85.00
Dogbane root (<i>Apocynum andraesimifolium</i>)		\$31.50
Elder flowers (<i>Sambucus caerulea</i>)		\$11.60
Feverfew (<i>Tanacetum pathenium</i>)		\$18.75
Fireweed root (<i>Epilobium angustifolium</i>)		\$22.00
Giant Horetail (<i>Equisetum telmateia</i>)		\$18.00
Goldenrod (<i>Solidago canadensis</i>)		\$7.95
Hawthorn leaves (<i>Crateegus douglasii</i>)		\$6.95
Heal all (<i>Prunella vulgaris</i>)		\$9.95
Horetail (<i>Equisetum hyemale</i>)		\$7.10
Indian Hemp (<i>Apocynum cannabinum</i>)		\$10.00
Kinnikinnik (<i>Arctostaphylos uva ursi</i>)		\$5.50
Lady Slipper root (<i>Cypripedium montanum</i>)		\$82.95
Licorice Fern (<i>Polypodium glycyrrhiza</i>)		\$14.00
Madrone (<i>Arbutus menziesii</i>) leaf		\$10.00
Male Fern (<i>Dryopteris felix-mas</i>)		\$10.10
Mullein (<i>Verbascum thapsus</i>)		\$8.00
Nettle Leaf, organic (<i>Urtica dioica</i>)		\$13.75
Oakmoss (<i>Evernia prunastri</i>)		\$5.75
Oregon Grape root (<i>Mahonia aquafloim</i>)		\$4.00-\$14.50
Pearly Everlasting (<i>Anaphalis margaritacea</i>)		\$13.75
Pissisewa (<i>Chimaphillia umbellata</i>)		\$10.00
Pleurisy Root (<i>Asclepius speciosa</i>)		\$14.66
Raspberry Leaf (<i>Rubus idaeus</i>)		\$4.95-\$14.95
Reed Root (<i>Ceanothus velutinus</i>)		\$16.00
Succiacap (<i>Scutellaria galericulate</i>)		\$20.00
Sheep Sorrel (<i>Rumex acetosella</i>)		\$7.45
St. John's Wort (<i>Hypericum formosum</i>)		\$8.55
Strawberry Leaf (<i>Fragaria vesca</i>)		\$7.95
Tansy (<i>Tanacetum vulgare</i>)		\$6.95
Valerian (<i>Valerian sitchensis</i>)		\$6.65-\$18.50
Willow flowers (<i>Salix sp</i>)		\$19.22
Yarrow (<i>Achillia millefolium</i>)		\$6.55
Source: Congnetics International Research Inc. "An Economic Strategy to Develop Non-Timber Forest Products and Services in British Columbia" Forest Renewal BC Project No. PA97538-ORE. March 15, 1999.		

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 15.

Market Prices : Timber			
Prices in Cdn. Funds, exchange rate: 1.390Cdn/U.S.\$ and 117Yen/U.S.\$			
Fir	Sort	\$/mfbm	\$/m3
	Hi-Grade	1,680-2,520	400-600
	Lumber	900-1,400	210-320
	Peeler 15"-20"		130-140
	Sml Peeler 8"-14"		95-100
	Std.old growth		105-120
	Std.. Snd growth		100-110
	Gang old growth		80-90
	Chip & Saw		50-55
	Pulp		20-25
Red Cedar	Sort	\$/mfbm	\$/m3
	Lumber	1,350-1,440	300-320
	House log		200-220
	Merch	825-875	165-175
	Shingle		100-130
	Gang	900-1,054	145-170
	Utility		55-80
	Chip & Saw		100-105
	Pulp		10-18
Hemlock/Balsam	Sort	\$/mfbm	\$/m3
	Ba Hi-Grade	675-855	150-190
	He Hi-Grade	787-945	175-210
	Standard	354-375	68-72
	Gang	310-340	50-55
	Pulp		34-36
Sitka Spruce	Sort	\$/mfbm	\$/m3
	Hi-Grade	1,700-2,440	400-575
	Hi-Shop	1,112-1,445	222-325
	Hi-Merch	700-900	149-191
	Shop	540-685	95-120
	Standard	530-672	95-120
	Gang	422-520	65-75
	Pulp		34-36
Cypress	Sort	\$/mfbm	\$/m3
	Hi-Grade	1,700-2,550	400-600
	Standard	755-885	145-170
	Gang		90-100
	Utility		65-85
	Pulp		15-20

Source: Pawliuk, Nick. The Forest Industry Trader. 2003

8.0 Community Impacts

8.1 Reduced Quality of Life – Construction Phase

Impact Description. Construction work on the highway upgrades is scheduled to begin in the spring of 2004. The construction work will occur between March and November from 2004 to 2009. Quality of life will be affected for communities of the Squamish Nation in the highway corridor in a number of ways:

- Construction related delays will affect business and personal travel for community members and those who do business with the Squamish Nation community (SEIA 2003).
- Travel through construction zones may be hazardous, and extra care will be required to manage traffic through construction times (SEIA 2003).
- Noise levels on adjacent residential communities will be sufficient to interfere with essential activities and to potentially cause substantial annoyance and negative reactions from residents (Wakefield Acoustics Ltd. March 2003).
- Air quality may be reduced by emissions from construction vehicles and equipment, and by dust created during construction (Levelton 2003).

Delays During Construction. Approximately 800,000 hours of vehicle delay is expected over the 6-year construction period or an average of 130,000 vehicle-hours per year. This compares to current vehicle delays of 90,000 vehicle-hours per year yielding delay increases per year at 30%. In the section from Lions Bay to Squamish the anticipated number of delays over the 5-year period is estimated at 920 delays/closures, Horseshoe Bay to Lions Bay 1,020 delays/closures and from Cheakamus Canyon to Whistler 930 delays/closures (SEIA2003).

Scheduled daylight and night-time closures will be avoided in June, July and August. There is to be no disruption to traffic on Fridays, Saturdays and Sundays. In addition, construction activities will be suspended during the months of December, January and February, which are outside of the construction season, and correlate with peak skiing season. The report also states, “the upgrading of the STS Highway is considered to be a night construction project as the majority of the work will be undertaken during the night when traffic volumes are lowest.”

Traffic delays due to construction will impact Squamish Nation members in the following ways:

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- Access to Traditional Lands – temporary impacts can be expected at accesses to adjacent properties and intersections with existing roads in the construction corridor. MoT estimates there are 178 access points and intersections along the corridor between Horseshoe Bay and Function Junction.
- Access to Health and Social Services – due to the location of highway improvements, and current health care referral patterns, the communities in the Squamish area will be most affected by intermittent delays and road closures. Residents of these communities have the longest distances to travel, potentially through two construction zones. In addition, home care workers will be affected.
- Emergency Services – access to emergency services will be affected by intermittent delays and night-time closures.
- Education and School Activities– Intermittent delays and construction speed zones may increase average travel times for buses travelling as part of extra-curricular activities. Extra curricular programs (sports events, etc.) scheduled on Mondays – Fridays between 10 am and 2 pm will be impacted. Students using the highway corridor for walking and/or cycling to school, home for lunch, and other extra-curricular activities may be impacted. In addition, those with evening educational courses may be impacted if travelling after 9 pm at night along the corridor.
- Commuter Use – Residents of the communities of Squamish Nation that travel along the corridor may be subject to intermittent delays. The delay experienced depends on the location of employment and the work time period. Day delays are scheduled to occur between 10 am and 2 pm Monday to Thursday. A total of 105 daytime closures between 10 am and 2 pm are planned and a total of 70 night closures between 8 pm and 6 am. Commuters working shift positions may experience some delays and may need extra time to provide for this.
- Resident Non-Commuter Use – Residents destined to points along the corridor for other uses may be impacted by intermittent delays. For example, the Bingo Hall located on I. R. No 24 hosts evening sessions attended by many Squamish area residents both native and non-native. Evening road closures may impact those travelling home along the highway. In addition residents attending social, cultural or other type of events in the GVRD will be impacted by restricted hours of operation.
- Local Business – during construction the cost of trucking through the corridor may increase and the scheduling of business dealings with customers and suppliers is expected

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

to be affected. In addition, future economic development in the Squamish area may be delayed due to concerns over construction period traffic delays.

Road Safety During Construction. Road safety through construction areas is a well-recognized concern. Construction areas are known to have higher collision rates than areas not under construction. The highway upgrades will create a number of active construction areas at any given time that may present a hazardous situation to Squamish Nation members travelling the Sea to Sky Highway corridor between Horseshoe Bay and Whistler.

Noise Impacts During Construction. Wakefield (2003) reports that a projection of the construction noise levels experienced within residential areas was undertaken to quantify the levels of noise attributable to highway construction and traffic detouring activities. In addition, the report provided a gauge of potential community sensitivity and reaction to construction noise, using a five-point reaction scale (No Reaction to Vigorous Action). Correction factors were employed to account for such elements as reduced tolerance to noise at night, previous noise exposure and community attitudes.

Wakefield (2003) concludes that potential for substantial impacts due to construction noise exists at most communities. The severity of the impacts and the associated community reactions will be strongly influenced by the degree to which noisy construction will be carried out during night time hours in close proximity to residential areas, as well as the number of concurrent phases of construction and simultaneous uses of many pieces of heavy equipment. The report suggests the concentration of the noisiest of activities should occur during daytime construction periods to reduce the associated noise impacts.

The report states noise impacts due to detouring traffic during construction are generally anticipated to be minor.

Air Quality. The Stawamus reserve (IR No. 24) will be affected by air pollution related to construction. The impact would result from particulate and other hydrocarbon emissions from diesel and gasoline powered equipment on the worksite, and from dust associated with grading activities and hauling of excavated material. Levelton (2003) estimates the following equipment emissions for the entire Sea to Sky Highway project (not just for IR No. 24) (Table 16):

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 16. Estimated Equipment Emissions during Construction

Pollutant	Annual emissions from construction equipment	Total emissions for 5 year construction period
	(tonnes/year)	(tonnes)
Carbon monoxide	696	3,480
Sulphur dioxide	2	10
Nitrogen oxides	565	2,825
Volatile organic compounds	25	125
Particulate matter	33	165

Levelton also estimates that the following emissions of construction-related dust would occur (Table 17). Road hauling would generate nearly 99 percent of the dust associated with construction.

Table 17. Sources and Estimates of Dust during Construction

Activity	Sources of Sea to Sky Highway construction dust	Total amount dust for 5 year construction period
	(tonnes/year)	(tonnes)
Clearing, grubbing, excavation	0.7	3.5
Grading and paving	0.04	0.2
Stockpiles	5.4	27
Road dust from hauling	365	1,825
Total	371.14	1,855.7

For residents of Stawamus (IR No. 24), air pollution from highway construction raises the following concerns:

- Health effects. Elders and children with respiratory ailments could be particularly at risk. Children on a daily basis frequent community facilities near the Sea to Sky Highway on the Stawamus Reserve, and health effects of air pollution are of concern.
- Property effects. High levels of dust in homes and institutional buildings can require higher levels of maintenance to keep structures attractive and usable. People may be

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

reluctant to open windows during summer, and furnace filters may require more frequent changing in winter.

- Resource effects. Thick coatings of dust on plants near construction areas (on and off-reserve) reduce the usability and desirability of plants and berries for harvest.

The spatial extent of the impact will be affected by wind direction and strength during work activities, but is always likely to be most pronounced within a few hundred meters of the construction area. Emissions-related impacts are short-term, although several months of construction activity could be expected on the Stawamus Reserve. Dust from grading can occur until exposed soil is revegetated or otherwise protected from wind, so these impacts are considered short term.

The Levelton study concluded that construction-related fugitive dust and diesel particulate matter is of concern since PM₁₀ was predicted to be 92% of the Level B Objective. Particulate concentrations could be even higher than the modeled levels, because these predictions did not include potential impacts from road dust, which are likely to be substantial during construction.

Mitigation Opportunities. Mitigation efforts should focus on:

- Conduct construction stage road safety audits throughout the construction phase of the highway upgrades.
- For the course of construction, a Squamish Nation member should be designated as a “Traffic Management Coordinator” to liaise, and facilitate all communications between the Nation and the MoT and their contractors. It is recommended this be a full-time paid position and be initiated as soon as construction is imminent.
- Concentrate the noisiest activities during daytime construction periods to reduce the associated noise impacts and update the noise report to reflect actual data and detour information as it becomes available.
- Reduce hauling of excavated and fill material, and water and cover exposed soil to reduce dust. MoT should commit to diligently following these and other dust and emission control recommendations.
- Conduct air quality monitoring on the Stawamus Reserve during construction. If high levels of air pollution are identified, then remedial measures should be instituted or other mitigation measures discussed with representatives of the Squamish Nation.

8.2 Reduced Quality of Life – Operations Phase

Impact Description. Once construction is complete, increased traffic as a result of the highway upgrades will:

- Decrease road safety at highway intersections and on other roads in and around the Squamish Nation as traffic volumes increase.
- Increase noise.
- Reduce air quality.

By 2025 traffic volumes along the Sea to Sky Highway are expected to increase between 50% - 60% over 2001 traffic volumes depending on the location in the corridor. In addition, as Table 18 illustrates, improving the highway corridor is expected to generate an additional 8% of daily trips traffic.

Road Safety. The improvements proposed for the corridor south of Whistler will be designed and constructed to accommodate increased traffic volumes, thus improving travel times and reducing accident rates on the highway (SEIA 2003). Collision rates and collision severity after construction is completed on the Sea to Sky Highway corridor will be reduced.

Table 18. Traffic Volume, Daily Trips (AADT)

Segment	2001	2025 without project	2025 with project	Overall Increase
Mount Currie and North	*481	+650	+700	49%
Whistler to Pemberton	**3298	+4500	+4900	49%
Squamish to Whistler ***	7,700	11,200	12,000	56%
Horseshoe Bay to Squamish ***	10,800	16,300	17,500	62%

* Note 1: MoT 2000, Station 15 - 045, Route 99 (Duffy Lake Rd), 17.0 km N of Rte 99/Vine/Pemb Rd Int.

** Note 2: MoT 2000, Station 15-002, 1.1 km N of Green River Rail Crossing

*** Note 3: Existing and future estimates from on STS Corridor Travel Demand Study, Final Report Jan 2002

+ Note 4: Future estimates based on STS Corridor Travel Demand Study, Final Report Jan 2002

Collision prediction models (CPMs) are used to predict the expected number of collisions. Several CPMs have been developed for British Columbia highways by researchers working at

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

the University of British Columbia (UBC) in conjunction with the Insurance Corporation of British Columbia (ICBC). The expected number of collisions is partly a function of traffic volume. As the traffic volume increases the expected number of collisions will increase, although the increase is generally not directly proportional. The BC Ministry of Transportation is currently completing a study to quantify the safety benefits of the proposed highway upgrades.

While safety for vehicles using the highway is expected to increase, safety for pedestrians and other non-motorized traffic using the highway shoulder or intersections will likely decrease. The Sea to Sky Highway bisects I.R. No. 24 just south of Squamish. A two-day short count of the non-motorized road users on the Sea to Sky Highway within IR No. 24 shows that an average of 30 people were walking or bicycling on the highway shoulders per day (Table 19). Most of the counts were conducted during raining or cloudy conditions. During the summer months, the number of non-motorized users could increase substantially. These highway users will be exposed to a higher risk of accidental injury or even death as traffic volumes increase.

Table 19. Non-Motorized Traffic on the Sea to Sky Highway through IR No. 24

Day Between 07:00 – 18:00	Northbound			Southbound		
	Pedestrians	Thru Cyclist	Reserve Cyclist	Pedestrians	Thru Cyclist	Reserve Cyclist
April 13, 2003	10	3	3	6	1	4
April 15, 2003	5	5	3	15	4	2

Noise Impacts. Wakefield (2003) assessed the potential community noise impacts post and during construction. The assessment process "involved the measurement of representative baseline (pre-project) noise environments at residential communities along the corridor and the prediction of the changes in noise levels (and associate impacts) [that] will occur during the construction and operation phases of the [Sea to Sky Highway] project, including the potential detouring of the highway traffic along the BC Rail line." The report was followed up by additional work at I.R. No. 24. The results of this additional work were presented at a meeting held May 22, 2003. This additional information supercedes information presented in Wakefield (2003). The following provides a brief overview of Wakefield (2003) and the additional information provided at the May 22, 2003 meeting.

Baseline noise monitoring was conducted at 2 sites on I.R No. 24, which were used as reference benchmarks (Table 20). These reference points were used to assess changes in noise levels as measured by the CMHC Highway Noise Prediction Model, a tool utilized to quantify noise impacts on residential areas.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

The impact of noise on a community can be categorized as direct or indirect. The direct impact of noise is interference with essential human activities such as speech communication, relaxation and sleep. Indirect impacts are annoyance and stress, for example. The Canada Mortgage and Housing Corporation (CMHC) established a residential impact threshold of L_{EQ} 55 dBA. This means that L_{EQ} (24) noise levels exceeding 55 dBA are considered to interfere with essential activities such as outdoor speech and indoor sleep.

Table 20. Existing Noise Levels on I.R. No. 24

Site	L_{EQ}	L_{DN}
In front of Totem Hall	L_{EQ} (46.5 hours) = 69.7 dBA	74.6 dBA
On Billy Avenue	L_{EQ} (44 hours) = 63.5 dBA	68.3 dBA

The source of this noise is primarily highway noise in combination with railway noise. All of these noise levels exceed the CMHC residential impact threshold. For a given type of sound or noise, the perception of ‘noisiness’ approximately doubles with each 10 dBA increase in noise level. This means that the existing noise level at Totem Hall is over twice the CMHC threshold, and at Billy Drive the noise level is approaching twice the CMHC threshold. Wakefield (2003) estimates that noise will increase a further 2 to 3 dBA with increased traffic after construction.

Air Quality. Levelton (2003) estimates air contaminants in the study area come from three sources:

- **point sources**, operating under a BC Ministry of Water, Air and Land Protection Air Permit,
- **area sources**, defined as “stationary non-industrial emission sources that do not require an air discharge permit. These sources are usually small individually, but may be significant collectively” (Levelton 2003: 43), and;
- **mobile sources** (motor vehicles, railways, marine vessels).

The releases of these materials were assessed for the airshed stretching from Horseshoe Bay to Function Junction (Table 21).

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table 21. 1995 Emissions in the Sea to Sky Highway Airshed (T/yr)

Pollutant	Source			
	Point	Area	Mobile	Total
Carbon monoxide	11,757	4,931	6,519	23,207
Sulphur oxides	488	33	175	696
Nitrogen oxides	1,656	228	2,420	4,302
Volatile organic compounds	609	2,327	768	3,703
Particulate matter	1,533	1,009	92	2,634

(Source: Levelton 2003)

Cars and trucks account for most of the pollutants emitted by mobile sources. Nearly 85 percent of volatile organics and 93 percent of carbon monoxide come from cars and trucks. Railways and marine vessels contribute 61 percent of nitrogen oxides, 83 percent of sulphur oxides, and 52 percent of particulates.

Stationary activities (point and area sources) account for much of the air pollution burden in the airshed. Stationary sources release more than 79 percent of volatile organics, 72 percent of carbon monoxide, 76 percent of sulphur oxides, and 96 percent of particulates in the region.

Levelton (2003) concludes that without the proposed upgrades, air emissions from cars and trucks would increase only slightly in the years 2010 and 2025 because of future improvements in fuel formulations and regulations. With the proposed upgrades, car and truck emissions are predicted to increase slightly (in the years 2010 and 2025) due to the additional 8 percent increase in traffic volumes. The models used in the report fail to examine what would happen if the expected fuel and regulatory improvements do not occur. As there are no assurances that the assumed improvements in fuel or vehicular regulations will be implemented, the impacts of the Sea to Sky Highway upgrade on air quality are expected to be long term, and will worsen as traffic volumes increase.

The highest concentrations of emissions will be within several hundred meters of the highway edge, and will be higher at intersections where vehicles stop temporarily. At the request of the Squamish Nation, MoT installed a traffic signal light at the intersection of Valley Drive and the Sea to Sky Highway on the Stawamus Reserve in 2002. The signal is intended to make turning and crossing movements safer. However, air quality may be affected by the signal light as vehicular starting, stopping, and idling produce higher levels of emissions than uninterrupted traffic flow. The release of particulates (a major human health concern) from diesels is especially noticeable as they accelerate after being stopped.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

The Valley Drive signal is near Totem Hall and other Squamish Nation facilities on IR No. 24. Although residents of IR No. 24 benefit from having the traffic signal, they also bear the health risks of increased vehicle emissions resulting from signalization of the intersection. The magnitude of the emissions change resulting from the signal is unknown, but the local air quality impacts are undoubtedly negative. As traffic volumes increase—and volumes will be greater with the proposed upgrades—the level of emissions will also grow. The spatial extent of the impact is local, probably within 200m of the intersection, and the impact will be long term.

The indirect, induced, and cumulative effects of the proposed upgrades on air quality could be more severe than air quality impacts in the immediate vicinity of the Sea to Sky Highway. Much of the air pollution in the Squamish Nation territory results from area and stationary sources. As population grows and the economy expands in the Squamish Valley and between Squamish and Horseshoe Bay, levels of pollution can be expected to increase. To the extent that the proposed upgrades supports increased residential, commercial, and industrial development in the region, it also is responsible for a share of the air pollution associated with that development.

Mitigation Opportunities. Mitigation opportunities include the following:

- A transition from the higher speed highway to an urban thoroughfare section should occur south of I.R. No 24, providing adequate facilities for motorized and non-motorized (e.g. pedestrians) users. The urban cross section should contain travel lanes, turning lanes (as required), bicycle lanes and sidewalks on both sides separated from the Sea to Sky Highway traffic by a boulevard strip.
- Prior to detailed design, the MoT should consult with Squamish Nation regarding proposed road/access changes that lay along the corridor potentially impacting access to traditional land territories
- Noise mitigation measures should be examined to reduce the future predicted noise levels to the CMHC residential impact threshold of 55 dBA. The current MoT application of the 1993 “Revised Policy for Mitigating Effects of traffic Noise from Freeways and Expressways” to I.R. No. 24 appears to be inappropriate as the proposed upgrades of the Sea to Sky Highway at I.R. No. 24 is neither an expressway nor a freeway.
- MoT should conduct air quality monitoring before construction of the highway upgrades and periodically thereafter to determine the level of air emissions change associated with the signal operation and with increasing traffic volumes. The resulting information would allow the Squamish Nation and MoT to determine whether mitigation is needed, and if so the kind and level of mitigation.

9.0 Cumulative Effects

9.1 Cultural Interference

Impact Description. Though overt markers of aboriginal identity may have faded over the generations, one thing that has remained constant is that Squamish Nation members regard their association with Squamish Nation territory to be enduring, regardless of their personal knowledge of its history or of its resources. Many places that were once used for Squamish Nation traditional practices have been taken over by housing developments, or lost to their use through environmental degradation, yet Squamish Nation people continue to take an interest in how proposed changes will affect their ancestral lands. They also hold considerable respect for those Squamish Nation individuals whose relationship to these lands they perceive to be more “traditional” than their own, by which they mean those who retain an interest in harvesting native foods, and who possess some form of spiritual connection to wilderness.

Commonly expressed among those interviewed was the sense of being overwhelmed by increasing numbers of non-aboriginal people coming into the Squamish Valley. Squamish Nation members perceive the result of this to be diminishment of a Squamish Nation presence. This concern goes beyond the deprivation of small-town comradery that existed when fewer people resided in the valley, which is viewed as the more favourable life-style. Squamish Nation people regard the escalating community development as a reflection of the government’s indifference to the existence of Squamish Nation aboriginal title, for British Columbia is seen to be facilitating other citizens’ interests in Squamish Nation traditional lands and resources, to the detriment of the Squamish Nation. The proposed upgrading of the Sea to Sky Highway is seen as yet one more assault on aboriginal title, which is the Squamish Nation people’s primary concern.

The impact of the proposed upgrades on the Squamish Nation title goes beyond the loss of culturally-significant plants found within the proposed highway corridor, or the blockage of convenient access to a favourite hunting ground. Increasing development, people and pollution displace traditional activities, or the potential to practice traditional activities. As reviewed in this report, economic growth throughout Squamish Nation territory, beginning in Burrard Inlet even before Indian Reserves had been set aside, has resulted in a gradual erosion of land being available for traditional pursuits.

Squamish Nation people are particularly observant that areas of wilderness will not be available to future generations. Numerous people recounted incidents of spirit dancers being watched by the public, questioned by the R.C.M.P., and chased away from places now regarded as “private

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

property.” Ceremonial gear, having been placed in a “clean” place where it was to be left for eternity, has been stolen.

Any sites on the south shore of Burrard Inlet that were once used for such spiritual activities became encroached upon by the City of Vancouver and have not been available to the Squamish Nation for many decades. Some areas on the north shore continue to be visited, but Squamish Nation people report that they now must bury their ceremonial gear, in contravention of traditional beliefs, so that other people will not disturb these sacred items. Private bathing areas are becoming hard to find. People from North Vancouver and from the Squamish Valley now go to places in the Squamish Valley and along the Sea to Sky Highway for these activities, but some of these sites, too, have disappeared as the growing urban sprawl spreads north to Whistler.

Special places such as Deeks Creek, which has a long history of being used for ritual bathing, are now used infrequently because hikers and others disturb the Squamish Nation people who bathe there. Bathing places on Furry Creek remain sufficiently hidden, although one of the areas that bathers visit here now borders onto a golf course and eventual dispossession of this site is anticipated.

Bathing sites at Stawamus, Brohm and Swift Creeks are located very close to the road. Until recently, bathers’ use of these sites was not too disturbed by traffic and the streams remained sufficiently pure to provide Squamish Nation people with the necessary ambiance to carry out their ritual baths, in easily-accessible spots. In the past several years, however, traffic has increased greatly, and it is anticipated that additional noise, pollution, and people will force the bathers to find other locations. Some dancers have already ceased using Brohm Creek because of this reason. While those Squamish Nation people who practice such rituals regret their dispossession of these specific isolated bathing spots, their overriding concern is the *cumulative* loss of wilderness to future generations of Squamish Nation people. Continuation of Squamish Nation religious practices requires on-going access to wilderness — remote areas devoid of other humans — but such areas are becoming harder to find.

Though there is a seemingly-abundant supply of wilderness in the northernmost parts of Squamish Nation territory, particularly between Cheakamus and Whistler, the uses to which the wilderness is being put by non-aboriginals are incompatible with traditional Squamish Nation practices. Areas visited by Squamish Nation hunters even ten years ago are now closed due to increased demand for year-round recreational use. Hikers, mountain bikers, skiers and ski-doers all require wilderness, but once these activities begin, hunting stops. This situation is particularly apparent around Brohm Ridge, long regarded as one of the best Squamish Nation hunting grounds, where increasing numbers of ski-doers and hikers are displacing Squamish Nation hunters, forcing them to move farther west into the still-uninhabited upper Squamish Valley.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

One of the biggest threats to aboriginal resources is not competition from non-aboriginals seeking the same resources, but rather competition from non-aboriginals pursuing activities in the same area that are incompatible with those carried on by the Squamish Nation.

Squamish Nation people view their continuing access to wild foods as an essential element of being aboriginal, despite the history of encroachment throughout their territory that has displaced many traditional activities. Squamish Nation people regard the right to hunt and trap, and the opportunity to do so, as being fundamental to maintaining a distinct aboriginal Squamish Nation identity.

During the past three decades, the Squamish Nation has promoted linguistic and cultural revitalization. Today, groups of elders and school children alike take excursions to the Squamish Valley to learn the fundamentals of ethnobotany, discuss the lifeways of former generations, and visit the locations of places of historical and cultural significance to their people. Those people interviewed for this project understand that this type of land-focussed cultural knowledge disappears along with the environmental base that makes such activities possible, and they fear that future generations may not have sufficient land available to them, should they wish to pursue these traditional activities. Older people and rural people may find their way of life under pressure from strangers who they do not understand, whose own personal values affect what type of land use they consider appropriate, some of which will conflict with Squamish Nation values. In this way, increased urbanization impacts directly upon traditional cultures.

The Squamish Nation people, nevertheless, do not restrict their use of wilderness to sustenance or spiritual activities; they go for country drives, hike, picnic, swim, and a few even ski and ski-do, along with non-aboriginal British Columbians. Some remote locations known to the Squamish Nation as sites for harvesting resources are used also for these more contemporary leisurely activities; a few have been set aside as parks. A local history of the Howe Sound to Whistler area extols the benefits of seven provincial parks in this area offering “facilities for hiking, camping, canoeing, and fishing,” the presence of which is generally viewed as a marker for a good quality of life (Armitage 1997:171). Squamish Nation people, however, complain that their enjoyment of parks for traditional pursuits is encumbered by regulations, and that their visits for leisurely activities is circumscribed by rapidly increasing tourism, citing as an example the parking problem around Browning, Alice and Brohm lakes, the favourite local summer swimming holes.

Increased pollution followed the population growth witnessed by the Squamish Nation since the completion of the Sea to Sky Highway in 1958. Squamish Nation people interviewed during this study noted the effect that Whistler’s sewage and the Valleycliffe (above Stawamus) housing development’s runoff have already had on the purity of water supplies and, ultimately, on the

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

health of the fish the rivers contain. The failure of the pink salmon run in the Stawamus River is seen as a direct outcome of houses being on the slopes. It is anticipated that highway construction will further impact the salmon and trout fisheries during the construction stage, if spawning beds are disturbed by heavy equipment and the installation of new culverts, and additional silt enters the streams, particularly in the Squamish Valley.

Still, it is the *cumulative* environmental degradation as a result of increased residential use in Squamish Nation traditional territory that is the greater concern to Squamish Nation members. Squamish Nation people feel their reserved land base has been whittled down, piece by piece, by rail and highway easements, and that Squamish Nation un-ceded territory has been taken from them or altered in ways so that sustainable use is no longer possible. They have recited a litany of environmental abuses and broken promises that accompanied the current rail and highway corridors. Around Stawamus I.R. 24, “Indian Lake,” once a water supply, was filled with rock, and a spawning channel of the Stawamus River disappeared, both as a result of rail and highway construction. Fewer people fish today for salmon in the Stawamus River, due to decrease in the runs. Berries once picked alongside the easements are no longer available due to pesticide use on the right-of-ways, and more ubiquitous grime.

Several Squamish Nation people voiced concern that the government’s upgrading of the Sea to Sky Highway encourages development without regard for the state of the local infrastructure, both on and off-Reserve. There is concern that British Columbia is spending hundreds of millions on a highway while the local roads, including those on reserve, are in poor repair and will only get worse with increased use. There is also concern that additional stress will be placed on secondary roads, services and resources throughout Squamish Nation territory.

The proposed upgrades will take more reserve land from I.R. 24 and impact directly and indirectly on all aboriginal residents on the valley. While no people like to have their way of life upset, the forecasted doubling of the population in the Squamish Valley over the next decade *will* be an upset for Squamish Nation members. Old routines will be interfered with, even travel to the local post office and hospital; crowding on the streets and in the neighbourhoods will cause discomfort; and economic advantages will be threatened. One of the anticipated indirect impacts of upgrading will be a growing disparity between the wealth of on and off-reserve residents, particularly in the Squamish Valley. Higher land values will place real estate beyond the means of most Squamish Nation members, just at the time when various initiatives are facilitating aboriginal people’s greater participation in the Canadian economy. Some Squamish Nation people fear that not only their members, but also the town of Squamish generally, will experience all the negative impacts of a new highway — noise, pollution, higher property values — while little will be done to encourage appropriate economic growth in the local community. Strip-mall development, already creeping along the Sea to Sky Highway, is expected to explode,

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

without consideration for small, locally-owned businesses, some of which are within the economic reach of future Squamish Nation entrepreneurs. There is an associated concern that construction of a three and four-lane superhighway will simply create a faster route from Vancouver to Whistler, and that local tourist traffic, and the complementary business, will decrease in Squamish itself.

No single dramatic event, apart from perhaps first contact itself, allows us to pinpoint a specific moment when Squamish Nation culture changed and aboriginal culture was replaced by a different pattern. Yet the facts suggest that during the last 200 years a variety of changes have led to fundamental transformation in the relationship of Squamish Nation people to their traditional territory. This period of Squamish Nation history was characterized by their displacement from lands that had formed the foundation of a sustenance economy, by the influx of non-aboriginal people, first into Burrard Inlet, and then into the Squamish Valley and Whistler areas. Aboriginal activities were gradually curtailed as increasing numbers of new-comers developed fresh uses for Squamish Nation land and its resources. Throughout this period of growth, Squamish Nation people adopted, adapted and rejected aspects of a dominant culture that held a fundamentally different concept of land use.

The cumulative impact of these conflicting views has been the loss of lands and resources that has led directly to a reduction in the Squamish Nation people's practice of traditional pursuits, and also in their ability to exercise these activities in the future. Places once visited for harvesting sustenance and material resources, or for finding spiritual assistance, are now the sites of housing developments, parks and ski-lifts, all linked by roads.

Squamish Nation people anticipate that the impact of further highway construction will be yet another erosion of their aboriginal rights and title, as non-aboriginals penetrate deeper and more intensely into the Squamish Nation wilderness, pushing the Squamish Nation into quickly-disappearing enclaves.

Mitigation Opportunities. Mitigation for cumulative effects should focus on the protection of aspects of Squamish Nation culture now and for future generations. Mitigation opportunities include:

- Consult with Squamish Nation regarding proposed road/access changes that lay along the corridor within traditional land territories prior to construction.
- Access controls and management plans that aid in preserving backcountry areas as well as culturally-important sites and areas should be developed with Squamish Nation input.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

The effects of increasing recreational access and preserving culturally significant area must be reconciled.

- Protection of special sites through acquisition of land.
- Publicly-distributed maps and highway signs that promote the use of indigenous place names, as well as local names throughout Squamish Nation territory, as a way of increasing awareness of the Squamish Nation culture.
- The development of a Squamish Nation interpretive centre could also increase the visibility of the Squamish Nation in the territory.

Appendix A. GIS Methodology for Land Usability Analysis

A GIS study was conducted to estimate the total area developable land within five kilometers of either side of the Sea to Sky Highway between Horseshoe Bay and Pemberton. Terrain Resource Information Mapping (TRIM) was used to establish the location of the existing highway centerline and slope classes within the study area.

Project details are as follows:

- The highway centerline was on the TRIM base. The start point was located approximately where the ferry terminal access road met the main highway. The end point was determined at the location where the highway pavement ended on the east side of Pemberton,
- The highway centerline was buffered 5 kilometres on either side to establish the total study area,
- Forest Cover Mapping (FC1) was used to eliminate all areas covered by water,
- Land on the west side of Squamish Inlet was eliminated as these areas were deemed not to be influenced by the highway development,
- Digital Elevation Model (DEM) data was used to generate the following slope classes:
 - 0 – 10%,
 - 10 – 20%,
 - 20 – 30%
 - >30%

Slope classes were generated using an 80-metre pixel, based on the available resolution of TRIM.

- Baseline Thematic Mapping (BTM) provided generalized land uses. Some land use classes indicated the land was undevelopable and were removed from the analysis, including:
 - Alpine,
 - Barren Surfaces,
 - Estuaries,
 - Glaciers,
 - Subalpine Avalanche Chutes
 - Fresh or salt water.
- Municipal boundaries were obtained from the MSRM website and added to the map base,

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

- TRIM slope classes, BTM land use, and municipal boundaries were overlaid and the resulting areas calculated in hectares. Results are shown in Table A1.

Table A1. Usable and Unusable Land by Slope and Jurisdiction, within 5km of the Sea to Sky Highway

Jurisdiction	Use Category	Area in Hectares				
		Slope 0 – 10 %	Slope 10 – 20 %	Slope 20 – 30 %	Slope > 30 %	Total
Municipality	Unusable	17	35	80	374	506
	Usable	6,475	4,208	4,379	9,596	24,659
Subtotal						25,164
Unincorporated	unusable	70	366	690	5,137	6,263
	usable	5,818	9,277	12,922	51,815	79,831
Subtotal						86,094
Total						111,258

Appendix B. Squamish Nation Land Demand Analysis

SUMMARY OF MEMBERSHIP FORECAST TO 2025

Table A2 shows total projected Squamish membership over the next 23 years. The medium projection of 2.5% per year has been highlighted as the most likely growth scenario, assuming a continuation of the present levels of growth post Bill C-31. At a 2.5% growth rate, membership in the Squamish Nation is forecasted at over 5500 members by 2025.

Table A2: Projected Squamish Membership to 2025

Rate/Year	June 2002	2010	2025
Low 1.5%	3160	3560	4450
Medium 2.5%	3160	3850	5580
High 3.5%	3160	4160	6970

(Source: Adapted from 2002 Inventory Portfolio, Squamish Nation)

HOUSING DEMAND SUMMARY

Housing demand is derived from:

- Squamish member households currently off-reserve wishing to relocate on-reserve
- On-reserve Squamish members wishing to establish their own households due to new family formation or other events
- The number of members on the Housing Wait List estimated at 800
- Assumption that the proportion of on-reserve population will increase to 70% by 2025
- An average of 3.3 members per household was assumed – consistent with the 2002 person per household estimate

Future demand for housing will come in the future as membership ages through the life cycle and as membership grows. Table A3 identifies how many housing are required to accommodate the forecasted on-reserve membership.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table A3. Projected On-reserve Housing Demand to Year 2025

Rate/Year	Estimated No. of Housing Units					Total Additional Units Demanded over next 23 years
	Current		Forecast		Forecast	
	2002		2010		2025	
Medium Forecast 2.5%	480		700		1180	700
Current Housing Wait List	800					800
Total Housing required						1500

(Source: Adapted from 2002 Inventory Portfolio, Squamish Nation)

In addition to housing the 800 members on the housing list, the medium projection indicates that 700 additional housing units will be required by 2025 to accommodate its members. This totals about 1500 new housing units by 2025.

Future land required for member needs including housing and other community facilities such as parks, as well as the infrastructure to support a community (roads, etc.) is based on the following:

- population forecasts for total membership
- population forecasts for Squamish community population (included members and non-members living on-reserve, (using medium growth scenario – 2.5% average annual growth rate)
- housing demand for single family dwelling at densities of 3 dwelling units per net acre or 7.5 dwelling units per net hectare
- an additional 30% land requirement for roads, parks, and utility infrastructure (i.e. easements)
- supply of 300 single family homes within existing reserve base (Source: 2002 Squamish Nation Inventory Portfolio)

Land required for future needs of Squamish membership is estimated to 2025 and is shown in Table A4.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

Table A4. Squamish Nation Future Housing & Community Use Land Needs

Land Requirements	Housing Units/Land Area
2002 Housing List	800 additional housing units
Short term housing need, 2002 -2010	220 additional housing units
Long term housing need, 2011-2025	480 additional housing units
TOTAL GROSS HOUSING NEED to 2025	1500 additional housing units
<i>Less</i> future serviced residential lots & infill lots	300 residential lots
TOTAL NET RESIDENTIAL LOT NEED to 2025	1200 residential lots
@ 7.5 units/hectare (single family development)	160 hectares
Plus 30% for roads, parks, schools and other community facilities, etc.	64 hectares
Total land requirement to 2025 for Squamish Nation needs	224 hectares

Appendix C. Non-native Land Demand Analysis

According to the SEIA prepared by KPMG, future population within the Sea to Sky Highway corridor will grow by approximately 30,000. With the proposed upgrades, the SEIA suggests that due to improved travel time and safety, the population could potential grow by an additional 11,000 people. Travel time savings will be a significant contributing factor to encourage development within the corridor. Population is expected to grow faster with an upgraded highway due to the improved access created between the corridor and the Lower Mainland. In other words, with the upgraded highway, the forecasted 40,000 plus people may have to be accommodated sooner than without the upgrades to the highway.

The SEIA infers that the incorporated municipalities, including the District of Squamish, Municipality of Whistler, Village of Lions Bay, and other communities within the Squamish-Lillooet Regional District, such as Britannia Beach, will absorb the future population forecast of 41,000 people. A review of the available Official Community Plans (OCPs) for communities within the corridor area suggests that not all of the anticipated population base can be absorbed within currently planned community boundaries. A review of forecasted population, OCP capacity, and the surplus/deficiency is provided in Table A5 below.

Table A5. Forecast of Population (Demand) versus OCP Capacity (Supply)

Community	Current Population (2001)	Forecasted Population 2025, according to SEIA with highway upgrades	OCP Capacity	Identified Deficiency between forecast and OCP capacity
District of Squamish	14,435	32,955	30,000	2,955
Village of Lions Bay	1,379	2,679	1,379	1,300
Resort Municipality of Whistler	8,896	18,981	11,658	7,323
Village of Pemberton	1,637	5,589	3,637	1,952
SLRD Area C	2,819	4,523	3,430	1,093
SLRD Area D	750	1,203	1,203	0
Total	29,915	65,930	51,307	14,623

Source: Socio-economic Impact Assessment, Official Community Plans for various communities within the corridor and personal communications with municipal and regional district staff. OCP capacity numbers are preliminary and subject to verification.

Note: From discussions with Whistler municipal staff, OCP capacity for Whistler is based on a 4% growth rate from an adjusted 2001 Census population of 9,965 to 2005. Build out of Whistler's development cap of 55,189 bed units is anticipated by 2005. Note that development cap may be lifted which would potentially result in changes to OCP capacity to accommodate future population.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
 BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

According to this analysis, 14,623 of the forecasted future population for the corridor communities can not, under current OCP policies, be accommodated within current community plan boundaries. This suggests that changes to OCP's would be required – either that densities within existing communities would have to be increased, including the lifting of the development cap adopted by Whistler, or that municipal boundaries would have to be expanded to accommodate the future population. This could also mean the creation of new communities within the corridor. Based on the anticipated need to accommodate population of 14,623 outside plan areas, the following land requirements have been determined as outlined in Table A6.

Table A6. Land Requirements to Accommodate Additional Regional Population

Future population to be accommodated outside current Community Plan boundaries	14,623
Using a person per dwelling unit count of 2.6 (2001 SLRD, total population of 33,011 divided by 12,565 private dwelling units)	5,624 dwelling units
Assuming 7.5 dwellings per hectare (this is a ratio for single family development, which dominants unit type in the corridor)	750 hectares
Assuming additional 25% land requirement for roads and utility infrastructure	188 hectares
Assuming a parkland requirement of 3.5 hectares of parkland and community use including schools per 1000 people	51 hectares
Assuming a commercial space requirement of 0.3 hectares of commercial space per 1000 people (includes retail, office, service commercial)	4 hectares
Total land area required	993

Source: Data prepared by UMA Engineering Ltd. interpreting information obtained from District of Squamish OCP for amount of commercial land requirements. Numbers are preliminary only, subject to verification.

SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

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SQUAMISH NATION
ABORIGINAL INTERESTS AND USE STUDY
BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

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SQUAMISH NATION
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BC MINISTRY OF TRANSPORTATION – SEA to SKY HIGHWAY UPGRADE PROJECT

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SQUAMISH NATION
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