Squamish Estuary Management Plan

1999

Background

1.1 Introduction

The Squamish Estuary is located in the District of Squamish at the head of Howe Sound, about 50 kilometers north of Vancouver, British Columbia (Figures 1 & 1A).

In response to development proposals over the years there have been a series of initiatives aimed at finding a satisfactory balance between protecting the area's biological productivity and achieving its economic potential. This document is supplemental to the 1992 Squamish Estuary Plan. It summarizes the most recent conclusions and recommendations of a multi-disciplinary team and incorporates several changes to the previous plan based on concerns and recommendations raised by various stakeholder groups. In brief, that team recommends that 579 ha (1432 acres) of the estuary be protected as a part of a 591 ha (1460 acre) Wildlife Management Area, that 350 ha (866 acres) be designated for industrial/commercial development (including related transportation corridors) and that a further 8 ha (20 acres) undergo further planning and analysis before a final designation is made.

For further information on the Plan and its evolution, there are four companion documents:

- The 1992 Squamish Estuary Management Plan, October 1992 (Revised August 1993)
- In Transition - The Squamish Estuary Management Plan 1982 - 1992
- You Asked I & II - Responses to the Public Issues Raised During Revision to the 1982 Squamish Estuary Management Plan
- The 1982 Squamish Estuary Management Plan

1.2 The 1982 Plan

In 1979 a management plan was commissioned by the federal Minister of Fisheries and Oceans and the provincial Minister of Environment. That plan, completed in 1982, (Figure 2) designated 394 ha (974 acres) for conservation, 271 ha (670 acres) for industrial development, and 258 ha (638 acres) for further assessment, totalling 923 ha (2282 acres), prior to land use designation.

The 1982 Plan also resulted in the formation of the Squamish Estuary Coordinating Committee (SECC). The SECC is a multi-agency group whose purpose is to link government, industry and private interests in guiding land and water uses in the Squamish Estuary. The SECC consists of:

- BC Environment
- BC Lands
- BC Rail
- District of Squamish
- Department of Fisheries and Oceans
- Environment Canada
- Ministry of Small Business, Tourism and Culture

1.3 The 1992 Plan

In 1992 the Squamish Estuary Coordinating Committee (SECC) brought forward a revised plan. Information on the evolution of the 1982 Plan into the 1992 plan is provided in *In Transition - The Squamish Estuary Management Plan 1982 - 1992*. The 1992 Plan (Figure 3) resolved much of the area designated for further planning and as a result, increased the area designated for conservation to 549ha (1356 acres), increased the area designated for industrial development including transportation corridors to 378 ha (934 acres) and reduced the area requiring further planning to just 8 ha (20 acres), totalling 935 ha (2310 acres).

Although the 1992 Plan was endorsed by all SECC member agencies, for a variety of reasons, it was never implemented and the estuary continued to be managed in accordance with the 1982 Plan.

1.4 The 1999 Plan

This 1999 Plan (Figure 4) reflects a further refinement of the 1992 Plan in terms of land uses in the estuary in response to the input of the Squamish Nation and in recognition of community concerns with the previous plan's designation of the environmentally sensitive Site A for industrial development. In this revised plan, the area designated for conservation has been increased to 579 ha (1432 acres), the area designated for development has been decreased to 350 ha (866 acres) and the area requiring further planning remains at 8 ha (20 acres), totalling 937 ha (2318 acres)*.

* Discrepancies in the total plan area between 1982 and 1999 are the result of more detailed surveys.

The Setting

2.1 The Squamish Estuary

The Squamish Estuary Management Plan area is about 935 hectares (2,310 acres) in size (Figure 4). The Squamish and Stawamus Rivers meet the sea in the Squamish estuary Together with its major tributaries, the Squamish River drains 3589 square kilometers of coastal rainforest and the Stawamus, River drains 62 square kilometers. The estuary contains both important natural habitat areas and offers important economic development

opportunities.

The estuary features extensive marshland, sand and mudflats intersected by the main channel of the Squamish River, the Mamquam Blind Channel, smaller flood channels and intertidal drainage channels. Mixed deciduous and coniferous trees have established themselves on the higher, periodically flooded uplands. Toward the sea grow both pure and mixed plant communities dominated by the sedges, grasses and rushes typical of areas inundated by fresh or brackish water. Wildlife found in the estuary include swans, ducks, shorebirds, eagles, hawks, songbirds, field mice, muskrats, rabbits, raccoons and occasionally deer, coyotes and black bears. Fish found in the Squamish River system include chum, chinook, coho and pink salmon, steelhead trout, sea run cutthroat trout, and Dolly Varden char. Biological studies of the estuary are available for public review in the Information Bank at the Squamish Public Library.

In terms of economic development, the estuary offers a rare opportunity to link the BC Rail mainline with accessible tidewater and develop a new marine terminal, In addition the forestry industry, an important component of the local economy, makes extensive use of the Mamquam Channel for log handling. Fishing and recreation are also important to the economy of Squamish. The river supports commercial, recreational and aboriginal food fisheries. Recreational uses of the estuary include nature observation, hunting, boating, windsurfing and hiking. Finally, the Mamquarn waterfront also offers residential and commercial development opportunities that have been strongly identified in the District of Squamish's Official Community Plan.

2.2 The Constraints

Resolution of land use issues in the estuary is complicated by environmental and economic considerations and sometimes conflicting jurisdictional authorities. Three different levels of government (federal, provincial, and local) hold varying and sometimes overlapping jurisdictional authority in the Squamish Estuary. Decisions made by these agencies, whose mandates are often narrowly defined, can and sometimes do conflict. Planning must both work within this jurisdictional complexity and provide a means of resolving jurisdictional conflicts.

The most pressing environmental consideration is the retention of sufficiently large unbroken areas of natural habitat to support the estuarine ecology. Clean and fresh water flows that ensure adequate water circulation throughout the basin are vital to this ecosystem. According to studies, the central basin offers the greatest potential for restoring and developing salmonid rearing habitat in the Squamish estuary.

Fundamental to economic development in the Squamish harbour is the need for clarity regarding which areas can be developed and under what conditions or prescriptive measures for environmental protection. Additional facilities for transportation, port back up and long term port development are also needed to help meet expected provincial demand for both inbound and offshore product movement. Tidewater booming, storage and transportation sites for logs need to be ensured and the growing demand for marinas

and public boat launch ramps needs to be met.

Any development must maintain the flood capacity of the main channel of the Squamish River.

2.3 Log Handling Facilities

Log handling facilities are required in the Squamish estuary by all logging companies operating in the Squamish Forest District. They are used for processing of logs from harvested sites, as well as resorting and re-handling logs from sources outside of Squamish. Logs are brought in from areas outside Squamish either by towing up Howe Sound for dewatering and resorting in Squamish, or from the Interior by rail or truck for trading on the coast. Logs are then shipped to market either by booming and towing, or in a few cases, by rail or truck

Log handling facilities in the Squamish Estuary have been an integral part of the forest industry in the Squamish Forest District since the beginning of logging. Squamish's location on the lower coast, and availability of the rail line offers unique advantages to local logging companies.

Approximately 800,000 m^3 of logs are annually sorted and boomed from within the Squamish Forest District (Soo TSA and TFL 38). In addition, about 500,000 m^3 is brought into the district from Howe Sound, dewatered, and resorted and a small volume of timber imported from the Interior. Most logs are transported to Squamish and as such, most log handling areas rely on access to tidewater for transporting logs to market.

There are presently 10 waterfront sites in Squamish. Three sites are strictly dump sites and the other seven are combination sorting, dumping and booming sites. The Ministry of Forests and the forest industry are dependent on the continued availability of log handling sites, particularly foreshore areas for dumping and booming logs. The availability of sites is limited because of the rugged terrain, environmental sensitivity and current land zoning. Current and future options are expected to diminish unless steps are taken to secure these sites.

The Squamish Estuary Management Plan calls for the phase-out of the West-Barr log handling facility on the west side of the estuary. On implementation of the SEMP, this site is proposed for closure after a period of 15 years. During this period West-Barr and the appropriate government agencies will work together to find a suitable replacement for the West-Barr site. The plan permits operations to continue around the downtown area, on the east and west side of Howe Sound and the lower Mamquam Blind Channel.

All downtown sites are currently zoned industrial, though the Official Community Plan indicates future zoning of commercial and residential along Loggers Lane. As waterfront values continue to increase, so will the pressure to develop the waterfront for non-industrial uses. In order to adjust to loss of land on the waterfront the industry will need to increase the handling capacity of the remaining sites by combining boom

reconfiguration with more efficient technology. In order to adjust to the loss of land on the waterfront the industry will need to secure an assured long-term upland dryland sort and merchandizing area in the Cheekeye Fan of approximately 40 hectares with access to highway and rail.

The Ministry of Forests and the forest industry believe it is vital to secure an upland dryland sort and maintain no less than two assured long-term suitable waterfront sites that can accommodate a multitude of lift and lower machines with protected foreshore of no less than 20 hectares and suitable adjoining upland of no less than 12 hectares as well as 36 hectares for boom tie-ups, located mainly outside of the SEMP area.

Squamish Estuary Management Plan 1999

3.1 Introduction

In developing the 1999 Squamish Estuary Management Plan (SEMP), the SECC has strived to achieve a balance between environmental and developmental opportunities in the Plan area - the two principle objectives of the planning process and the Plan are to ensure that:

- ecological diversity and environmental quality are sustained in an intact ecological unit comprising physical and biological features representative of the original Squamish River estuary; and
- sufficient land and water area is allocated to enable industrial, commercial, recreational, transportation-related and other development to proceed in order to strengthen the economic base of the community.

Accordingly, areas of the estuary have been designated as Conservation or Industrial/ Commercial (Figure 5) to clarify land and water use intentions and establish a balance between environmental conservation and economic development. A Transportation Corridor has been designated to meet future road and rail access needs.

3.2 Area Designations

The areas designated Conservation, Ind ustrial/Commercial, Transportation and Planning Assessment are shown in Figure 5. Development is directed to the east side of the estuary and conservation to the west. The Habitat Compensation Agreement ensures that loss of habitat in the Ind ustrial/Commercial area is compensated by enhancement of habitat in the Conservation area and by expansion and protection of the Conservation area through transfer of land title to the Crown. In this way, compensation for habitat loss in the Indus trial/Comme rcial area is carried out on an area-wide instead of a projectspecific basis.

Small boundary changes may be required and allowed without the necessity of plan amendment. Like all project proposals, any such change in any one of the designated areas would have to go through the project review process outlined later in this plan.

Habitat compensation may be required.

3.2.1. Conservation

The conservation areas are dedicated to the maintenance and enhancement of fish and wildlife habitat.

The conservation areas comprise 579 ha (1432 acres) which will be protected and dedicated to the maintenance and enhancement of fish and wildlife habitat. Uses, which do not impair the natural productivity of the estuary, such as public access for education and recreation (including windsurfing), will be allowed and encouraged, where compatible with environmental concerns. Municipal infrastructure such as waterlines, sewer lines, dykes and existing roads are also an allowed use.

Activities required to repair and maintain dykes, maintain flood capacity of the main channel of the Squamish River, as per the District of Squamish Flood Hazard Management Plan, May 1994, Klohn Leonoff Consultants, and to maintain municipal infrastructure are permitted in accordance with the MELP-DFO provincial guidelines for dyke maintenance, to minimize detrimental environment impacts. These works are generally not expected to result in harmful effects to fish and are not generally expected to require habitat compensation. Some works (i.e., enlargement of a dyke footprint or significant dredging) may however, need to be further assessed and may ultimately require compensation.

A Wildlife Management Area (WMA) comprising 561 ha (1386 acres) (Figure 6) encompassing the conservation area, and extending beyond the western boundary of the Plan area, will be created and managed by Ministry of Environment, Lands and Parks in conjunction with local interest groups including the Squamish First Nation. An additional 30 ha (74 acres) will be transferred to the Squamish Nation and placed under a restrictive "Wildlife Management" covenant to ensure it is managed in a manner consistent with the conservation objectives of the WMA. Management objectives for both areas focus on maintaining and enhancing the productive capacity of the estuary and dealing with public access issues will be developed in consultation with the public when the WMA is established.

3.2.2 Industrial/Commercial

The Industrial/Commercial areas are dedicated to industrial, commercial and other forms of development.

The industrial/commercial area comprises 350 hectares (866 acres) and is dedicated to industrial, commercial and other forms of development including necessary transportation infrastructure (Figure 7). A deep-water port, together with essential support facilities, is expected to be developed on the east side of the estuary at the mouth of the Mamquam Blind Channel. This area will also accommodate a log handling and watering facility. The rest of the industrial/commercial area is available for industrial, commercial

and related uses. The plan recognizes and supports the District of Squamish's objectives of creating a pedestrian access (boardwalk), and maintaining flood protection along the Mamquam Blind Channel.

Development in the industrial/commercial area is subject to environmental impact avoidance and mitigation, such as relocation, redesign and construction tin-Ling considerations and water quality regulation on a project specific basis. Habitat loss need not be compensated since compensation will be carried out on an area-wide basis as outlined in the Habitat Compensation Agreement.

Within the Industrial/Commercial area, consideration is given to three special land uses: buffers, storm water detention and control, and pedestrian links. Buffers are strips of land which are left in their natural state. Figure 12 shows where they will be established to provide distance, noise protection, and visual separation from Industrial/Commercial sites. Buffers also help to protect adjacent natural habitat and processes and may contain nature trails. Depending upon its location, a buffer will extend at least 30 meters from the shore's high water line, the centre line of the dendritic channel, or the centre line of the dyke. In each case the line in question will have to be legally surveyed when development is proposed in the adjacent area.

Access to the Malamute is achieved in the vicinity of Site B and this issue should be considered in the eventual port design.

Cattermole Basin provides flood and drainage relief for the District of Squamish. This function will always be maintained. This Industrial/Cornmercial area win only be developed following the District of Squamish's approval, which will be based upon studies ensuring that future requirements for storm water detention and flood control can be met. If the basin is altered, the new design will allow for plant growth along the basin's edge.

3.2.3. Transportation Corridor

The Transportation corridor is for future road and rail transportation if and when needed.

A 60 metre wide transportation corridor for future road and rail infrastructure has been established along the western edge of the development area. This corridor will be kept in its natural state and protected under the Fisheries Act. Any proposed road and/or rail development will be reviewed under the Squamish Estuary Project Review Process. Design of the road and/or rail infrastructure will be undertaken concurrently and cooperatively by the District of Squamish and BC Rail to minimize the loss of habitat however, this development may require that some of the existing channel area in the central basin or at the southern end of the transportation corridor be filled in which case compensation will be required for habitat losses. The proposed new road will need to connect to the existing downtown street network and BC Rail will be required to dedicate streets as necessary to accommodate such connection(s). Consideration will be given to

aligning future road and rail works to the east side of the existing lead track to Squamish Terminals, to the south of the existing wye tracks, subject to economic and environmental impacts as well as engineering feasibility.

3.2.4. Planning Assessment

The Planning Assessment area is one for which further planning and assessment is needed before it can be redesignated.

This review should be undertaken as a priority activity following implementation of the Plan. Additional study, data collection and public consultation are needed to enable balanced consideration of social, environmental and economic factors. In the meantime, projects proposed for the Planning Assessment area will be reviewed on an individual basis. The environmental assessment will be conducted by the Squamish Environmental Review Committee (SERC - see section 4.1) and may be subject to existing regulatory provisions, including environmental impact mitigation measures, based on the expected effects of the project. Habitat compensation, if deemed to be an acceptable option, may also be required.

3.3 Access

Pedestrian access to the Conservation area from the residential area near Vancouver Street will be maintained. Care will be taken to ensure public safety in the Industrial/Commercial portion of this access route. Additional public access will be allowed in the future, subject to safety and environmental issues.

Vehicular access to the training dyke will also be maintained.

Industrial access to the west side of the Squamish River for forest extraction using current infrastructure is not precluded by the plan but care must be taken to conserve and protect the environmental values of the conservation area. Further approval from the District of Squamish will be required to ensure coordinated and appropriate trucking routes.

3.4 Development Activities and Fish Habitat Protection Measures

In order to determine the potential impacts of a proposed project on fish habitat, the project's design details, construction methodology, location, scheduling and operation must be reviewed and the direct and indirect impacts identified and analyzed. In addition, bio-physical information will also be required to characterize the habitat, to determine the fish species using the habitat and the project site or the area impacted by the project, so as to assess the suitability of the habitat to provide the life requisites for fish and to assess whether the project is likely to cause a "Harmful alteration, disruption or destruction" (HADD) to fish habitat. It is the responsibility of the proponent to supply the information needed to make this determination.

In conducting its review of the project, DFO will apply its "Policy for the Management of Fish Habitat", which describes a "hierarchy of preferences" to be followed. This includes:

- Avoidance of Impacts - i.e. through alternate relocation or project redesign;
- Mitigation - for example, implementing sediment controls to protect fish habitat or using timing windows to minimize effects during periods of low fish presence.
- Compensation - if, and only if, after taking in account avoidance and mitigation measures, the project proposal is still likely to result in a HADD, habitat compensation, if deemed to be an acceptable option, may also be required. In these cases, an Authorization pursuant to Section 35(2) of the *Fisheries Act* will be required. Authorizations cannot be issued until adequate compensation measures have been specified which will result in achieving "No Net Loss" of productive capacity of fish habitat.

DFO's "Policy for the Management of Fish Habitat" and the "Conservation and Protection Guidelines" provide additional details on this hierarchy of preferences for achieving "No Net Loss" of productive capacity, including a preferred hierarchy for compensation options.

In addition, the issuance of a *Fisheries Act* Authorization is a trigger for DFO to conduct an assessment of environmental effects resulting from the project pursuant to the Canadian *Environmental Assessment Act* (CEAA). DFO intends to conduct its CEAA assessment responsibilities concurrent with the coordinated environmental review process under this Plan. As part of the CEAA review, DFO will need to determine if significant adverse environmental impacts, for example, a HADD to fish habitat, are justifiable under the circumstances.

These fish habitat protection measures will be thoroughly applied to all development activities throughout the Plan Area, including projects within the area designated as Indus trial/Commercial. Unless already provided, a bio-inventory as above will be required prior to Authorization. However, it is intended that habitat losses, or HADDs, as a result of projects within and/or adjacent to the Industrial/Commercial area that impact habitat within this designation area will be pre-compensated through this Plan, by the protection of the conservation areas and the completion of the habitat improvement projects illustrated in Figure 9. Therefore, no further compensation will be required for projects within the Indus trial/Commercial Area including, for example, along the western edge of the Mamquam Channel in downtown Squamish.

The following compensation projects are designed to facilitate juvenile fish access to the central estuary, improve water circulation, eliminate industrial activities and generally improve ecological diversity and productivity in the Conservation area. They will be formally documented in a Habitat Compensation Agreement between DFO and BCR.

Funding for the maintenance of existing and planned culverts and debris structures will be provided by BC Rail in the amount of $2500 per year for 20 years. DFO win manage the funds and maintain the works.

SITE 1: CONSTRUCTION OF TWO CULVERTS IN THE SQUAMISH RIVER TRAINING WALL

Previously, young salmon, trout, and char migrating downstream had to swim down the length of this dyke to its end near the deep water of Howe Sound and then back up to the rearing habitat in the upper part of the estuary's central basin. With the completion of these two culverts, salmon, trout, and char are now able to directly access the central basin, thereby increasing their chances of finding the best habitat in which to adjust to marine conditions and to avoid predators in order to better survive the ocean phase of their life cycle. The newly placed culverts are also increasing the flow of freshwater into the central basin, thereby improving the temperature and oxygen content of the water in its upper reaches. More freshwater flow means more mixing of river water with salt water moving in from the sea, which means that a greater variety of plants and animals can flourish. The flood protection function of the dyke will not be compromised by the construction of these culverts. ***Status: Completed by DFO in September 1995***

In addition, BC Rail is still committed to installing an additional pair of culverts, at an alternative site on the training wall as directed by DFO. ***Status: Pending implementation of SEMP***

SITE 2: REMEDIAL WORK ON TWO EXISTING CULVERTS IN THE TRAINING WALL

This work is also designed to improve fish access to and freshwater circulation in the central basin without compromising the flood protection function of the training wall. Currently, migrating fish are unlikely to find the culverts due to the large accumulation of debris at their river entrances. A debris control device will be constructed to prevent blockage of culverts. ***Status: Pending implementation of SEMP***

SITE 3: CONSTRUCTION OF A NEW HABITAT OR REWATERING CHANNEL WITHIN THE ESTUARY

This site is on the boundary between the Conservation and the Transportation Corridor areas. Road or rail expansion on the Industrial/Commercial side may encroach slightly on the Conservation area and require filling of some the existing channel area in the central basin. The developer will pay for a complete inventory of any habitat lost due to encroachment if it occurs and compensate for that loss with the construction of a new channel in the Conservation area. Design of the new channel will take into account the habitat lost at the site of its construction. The new channel will not only provide habitat, but will also help to further improve the circulation of fresh water in the central basin. More importantly, it win result in more frequent flows into and out of the vegetated portions of the basin. This win provide additional preferred habitat area and will flush detritus, matter into the estuary Construction of the channel is to be completed prior to any fill being placed. ***Status: Pending implementation of SEMP and design of road and rail facilities.***

SITE 4: REMOVAL OF DREDGED SAND ALONG THE SQUAMISH RIVER TRAINING WALL

Removal of this sand will allow habitat which has been buried since the early 1970s to recover. The area win be graded to appropriate elevations to maximize marsh vegetation growth and be prepared for revegetation and is expected to develop into healthy estuarine habitat. Removal of the sand commenced in the early-mid 1990s in response to demand for fill material and revegetation and recovery is wen underway in the areas where the sand has been removed. Use of removed sand in Squamish is subject to municipal regulations. ***Status: Underway and approximately 50% complete. All sand to be removed by Sept. 30,2005.***

SITE 5: DECOMMISSIONING OF THE WEST BARR LOG SORT OPERATION

The removal of this dry land log sorting and dumping operation win eliminate industrial activity from the Conservation area. West Barr win be required to remove debris and clean the site by the cleanup bond attached to its land tenure. ***Status: To be completed 15 years following implementation of SEMP - no later than October 13th, 2014.***

The Project Review Process

4.1 Organizational Structure

Squamish Estuary Management Committee

Administration of the Plan will be the responsibility of the Squamish Estuary Management Committee (SEMC), which will replace the SECC. The SEMC will be appointed at the discretion of the governments upon adoption of the Plan. The SEMC is expected to consist of current SECC member agencies plus representatives from the Squamish Nation, and the Ministry of Forests as well as local conservation and commercial interests.

The function of the SEMC will be to coordinate planning and management of environmental and developmental activities in the Plan area. The SEMC will strive to achieve consensus on the use of land and water resources in the Plan area and will be responsible for:

- integrating the interests of all stakeholders; refining and administering the estuary management plan;
- overseeing the Squamish Estuary Project Review Process (currently undertaken by SEEAC);
- producing an annual report on Squamish estuary management;
- and establishing its own decisionmaking process

- minimizing impacts to the natural function of the estuary.

Squamish Environmental Review Committee & Plan Coordinator

The SEMC is assisted in its activities by the Plan Coordinator and the Squamish Environmental Review Committee (SERC).

The Plan Coordinator, presumed to be a representative of the District of Squamish. In the event Squamish declines, one of the other SEMC members will be responsible for:

- guiding prospective proposals through the project review process;
- advising SEMC when project proposals are submitted to SERC;
- carrying out administrative tasks associated with the Plan;
- liaising with government, industry and the public; and
- maintaining the Information Bank

To aid in streamlining the operation of SEMC, the SERC, consisting of representatives of BC Environment, Lands and Parks, Department of Fisheries and Oceans, District of Squamish and Environment Canada, will be formed. Working under the terms of reference provided by the SEMC, the SERC screens project proposals, directs them to the appropriate review process, and monitors their progress through that process. In addition, SERC will undertake technical environmental reviews of proposed projects not subject to other environmental review processes. The SERC Chair will provide status reports on projects under review to the Plan Coordinator for presentation to SEMC.

4.2 Project Review Process

Development within the estuary is subject to all normal municipal review processes and procedures. In addition, it is also subject to environmental assessment by a variety of environmental agencies. In order to facilitate the assessment, a coordinated review process has been established for all development proposals within the estuary area.

The Squamish Estuary Project Review Process provides a path through the various jurisdictional authorities and review procedures facing any development in the Plan area. It is designed to protect and enhance the environmental and social integrity of the Plan area by encouraging sustainable development that conforms to the intent of the Plan.

The process, which is illustrated in Figure 10, begins with the submission of the proposal to the Plan Coordinator who determines which review path should be followed. Three paths are proposed:

- Path 1 is for projects with low environmental impact and will be reviewed solely by the Plan Coordinator.
- Path 2 is for projects with moderate environmental impact and will be reviewed by the SERC.

- Path 3 is for projects will high environmental impact and will be referred by the SERC to the appropriate environmental agencies for more intensive review and evaluation.

In most cases, the process concludes with the SERC forwarding its recommendations, in writing, to the appropriate regulatory agencies with a copy to the proponent. These recommendations outline any conditions of approval, additional information requirements, or the rationale for rejection. The terms and conditions of approval are to be incorporated into the permits or approvals granted by the regulatory agencies.

This process is subject to ongoing review and refinement by the SEMC members.

Time Frame

The proponent will receive a response within 30 days of submitting the proposal to the Plan Coordinator. This response will indicate which path has been chosen for the project or request more information. Throughout the process, the Plan Coordinator will keep the proponent apprised of progress and the time each step is expected to take.

Information Bank

The Plan Coordinator will ensure that the prospectus and project-related information is filed in the Information Bank at the Squamish Public Library. This material is available for public view at any time during regular library hours. Individuals wishing more detailed information on the review process are encouraged to contact the Plan Coordinator.

Conflict Resolution

It is expected that any conflicts will be resolved during the review process. Where they persist, the SEMC will determine the appropriate course of action, which may include public meetings or mediation.

4.3 Ongoing SEMP Review Initiatives

The SEMC will review the Squamish Estuary Management Plan every 5 years. Substantial amendments, such as significant area designation changes, must undergo public review. The SEMC will determine the extent to which proposed amendments are reviewed and will take responsibility for decisions about minor amendments. If necessary, working groups may be formed by the SEMC to analyze specific concerns related to the estuary

The process for substantial amendments is outlined below.

a) develop amendment

b) present it to the public

c) receive public comment

d) review public comment

e) incorporate public suggestions as appropriate

f) report back to the public explaining how and why suggestions were or were not used

g) receive public comment

h) complete the Plan

i) submit the Plan for member organization endorsement

j) approve and implement the Plan

Implementation

5.1 Agency Approval

Prior to proceeding with implementation, the agencies represented on the current SECC need to present the 1999 Plan to their respective executive and political levels to confirm support. In addition, the Department of Fisheries and Oceans must complete the Habitat Compensation Agreement.

5.2 Land Exchange

To facilitate the creation of the Wildlife Management Area, a land exchange between the Province and the BCR needs to be completed. A map of the exchange lands is attached as Figure 11.

5.3 SEMC Formation and Work Program

Membership on the SEMC must be identified and the Committee established. The SEMC may wish to begin its work by:

- establishing operating procedures and terms of reference;
- arranging funding for implementation of the plan;
- considering whether membership of the Squamish Environmental Review Committee should be restructured;
- considering the establishment of local advisory groups to enable full appreciation of local knowledge and concerns;
- making review of the Planning Assessment area a priority, and
- carrying out the work program outlined in Appendix II

SIGNATURE PAGE

1999 Squamish Estuary
Management Plan

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Squamish Location

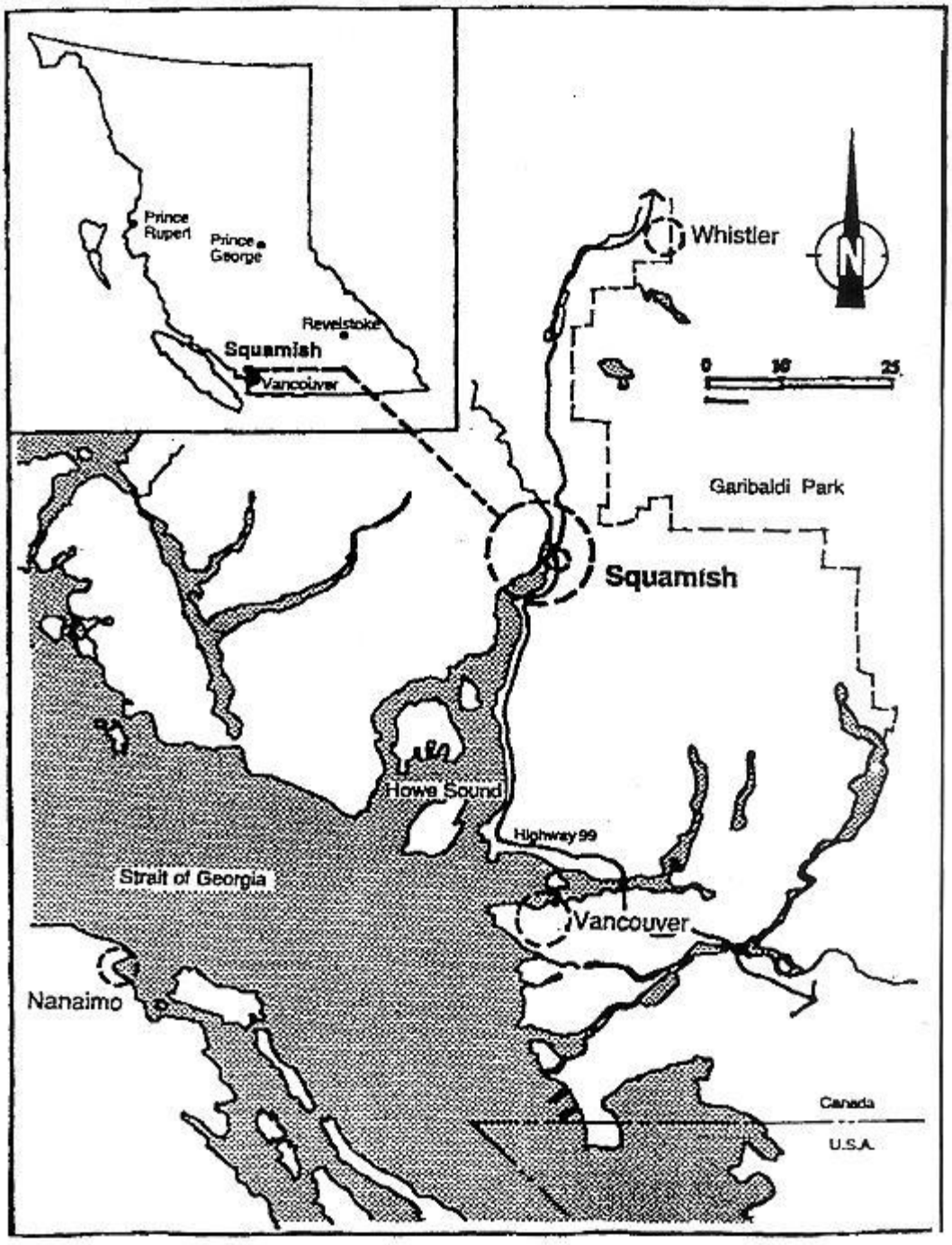

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Figure 1 – Estuary Area

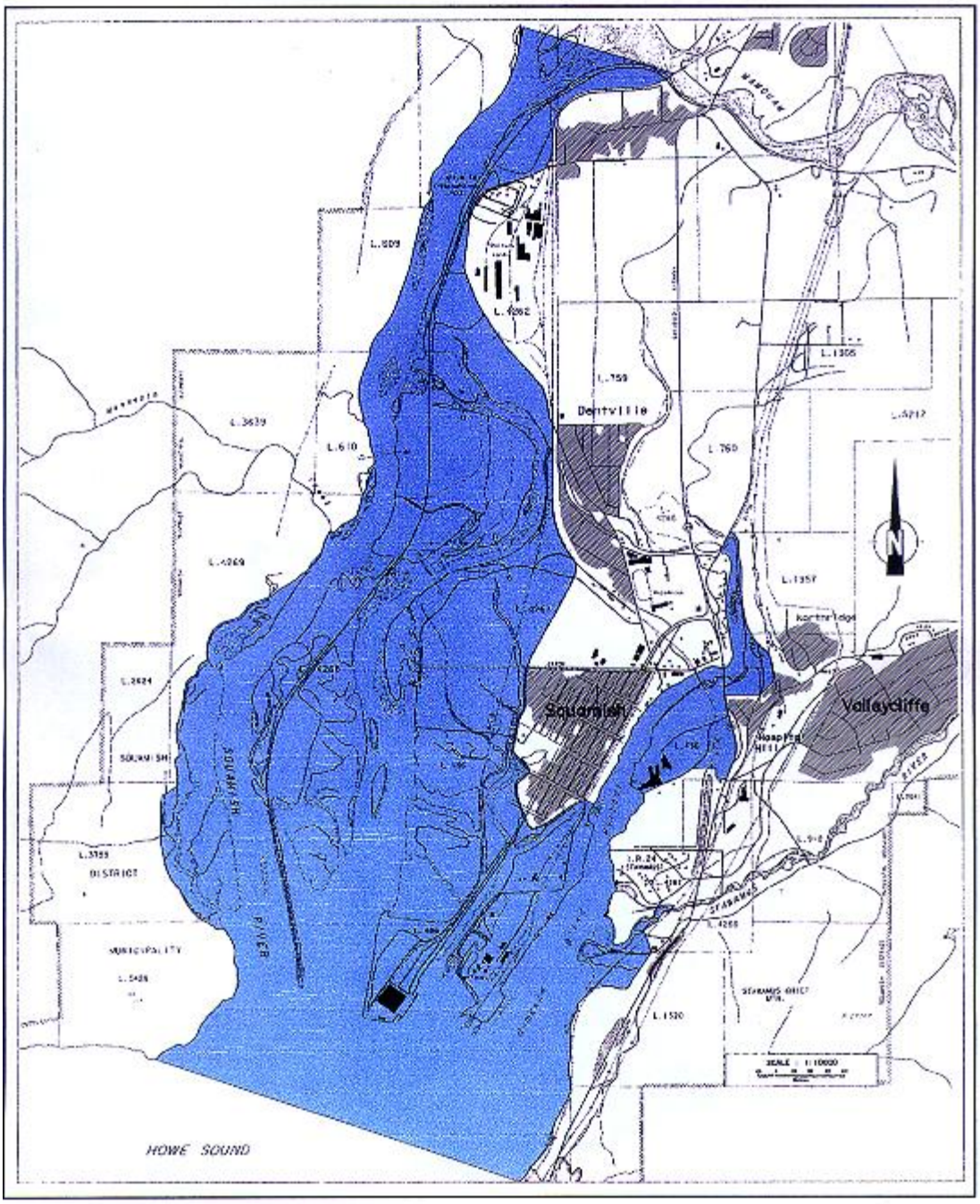

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Figure 2 - 1982 Plan

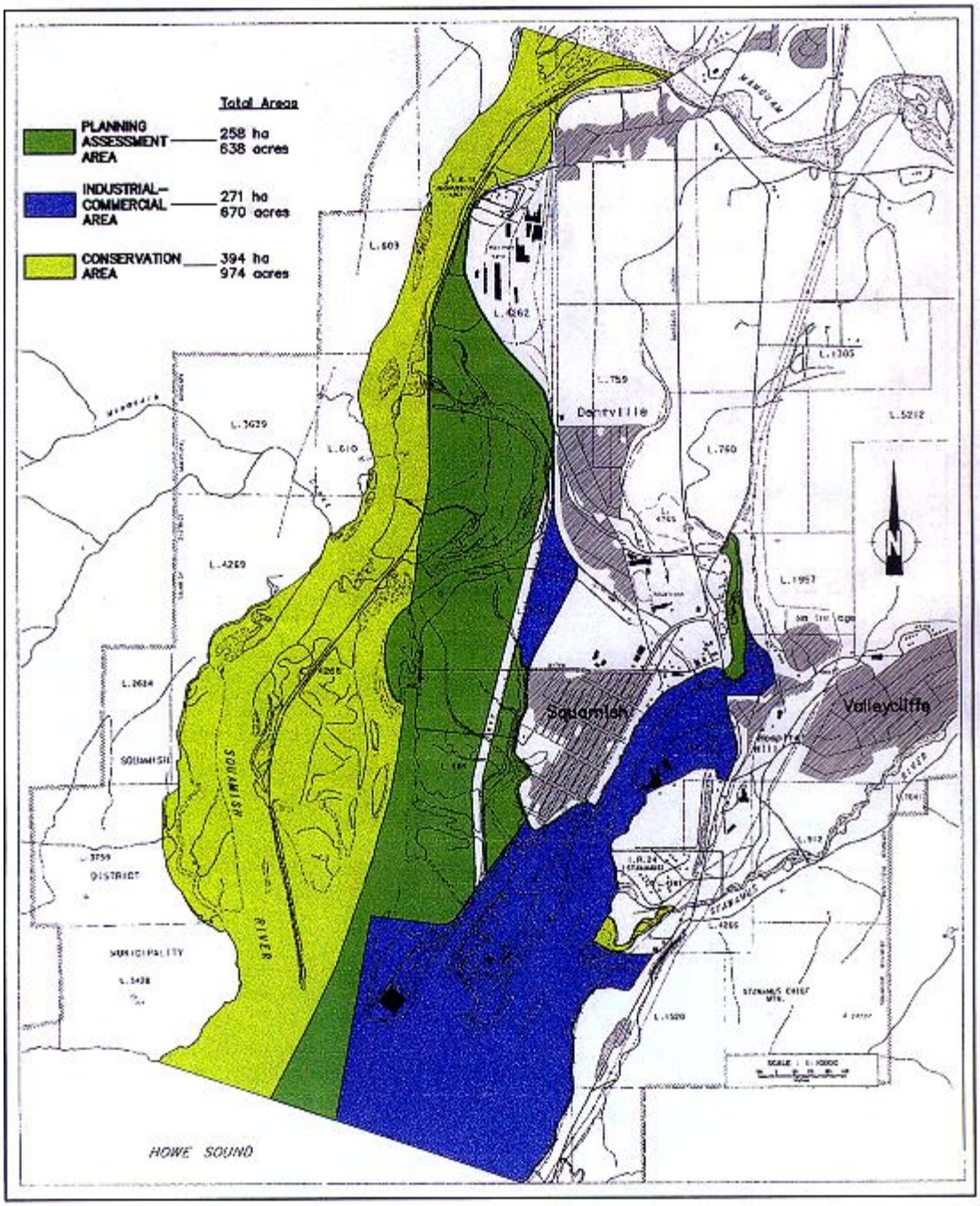

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Figure 3 - 1992 Plan

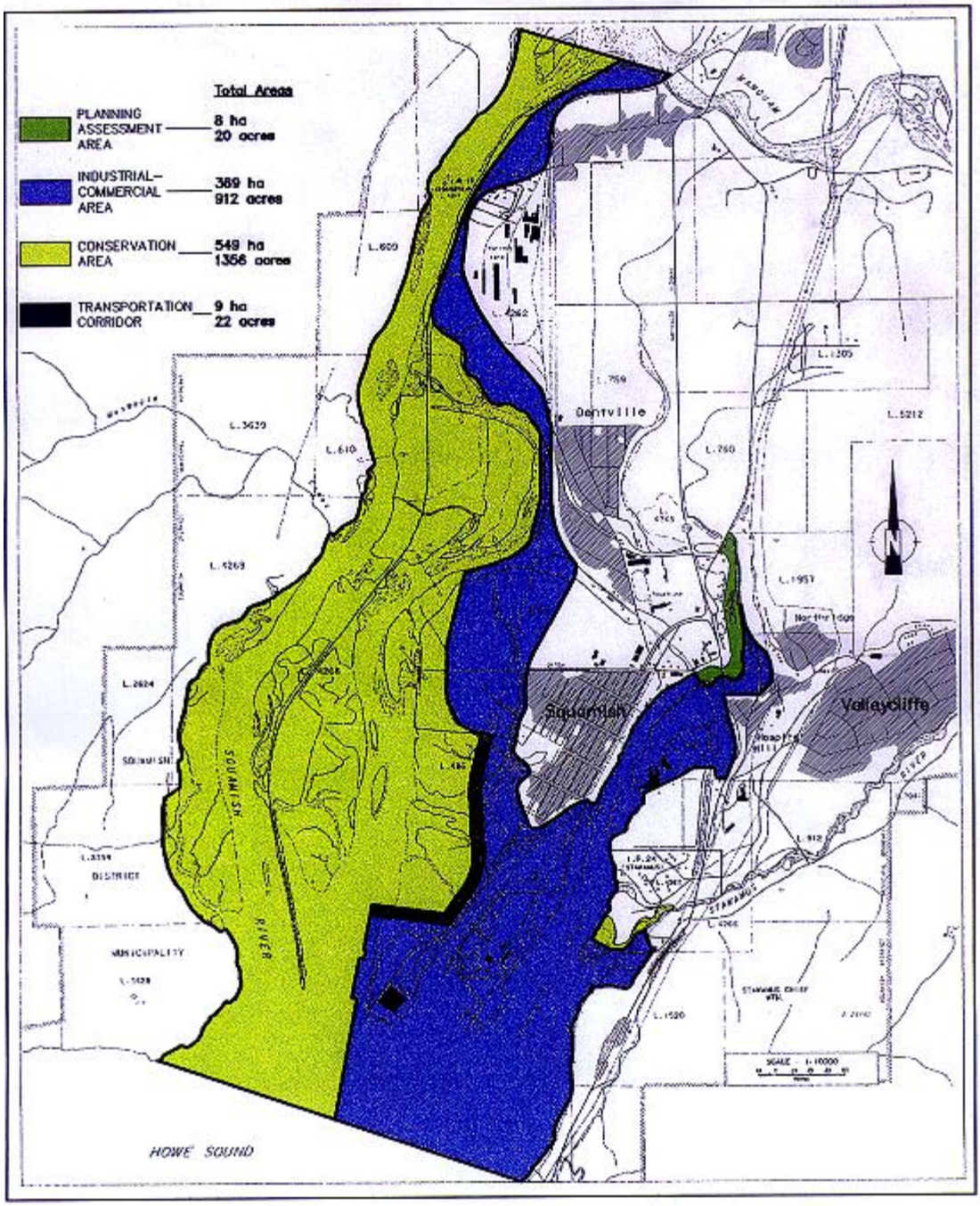

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Figure 4 - 1999 Plan

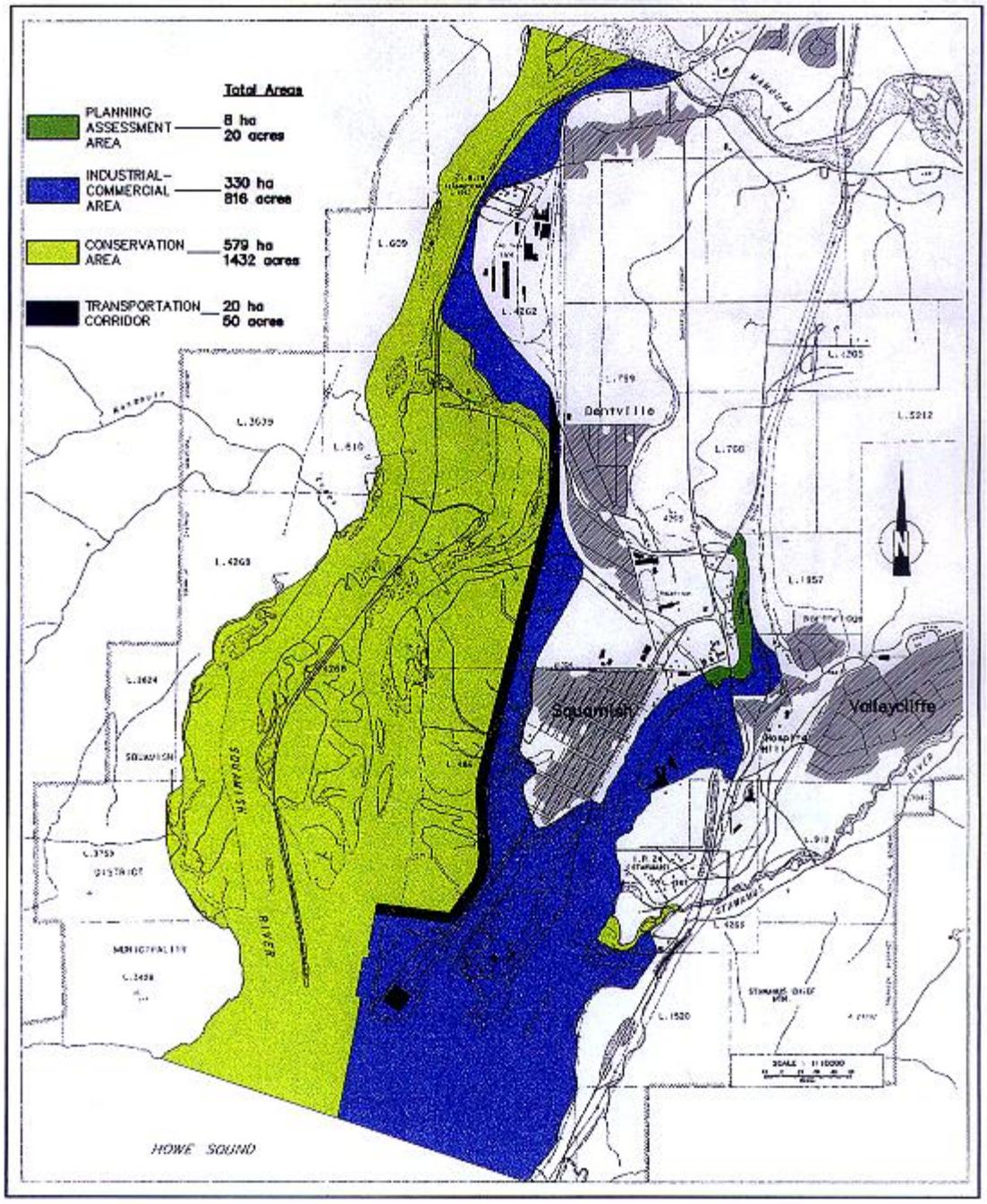

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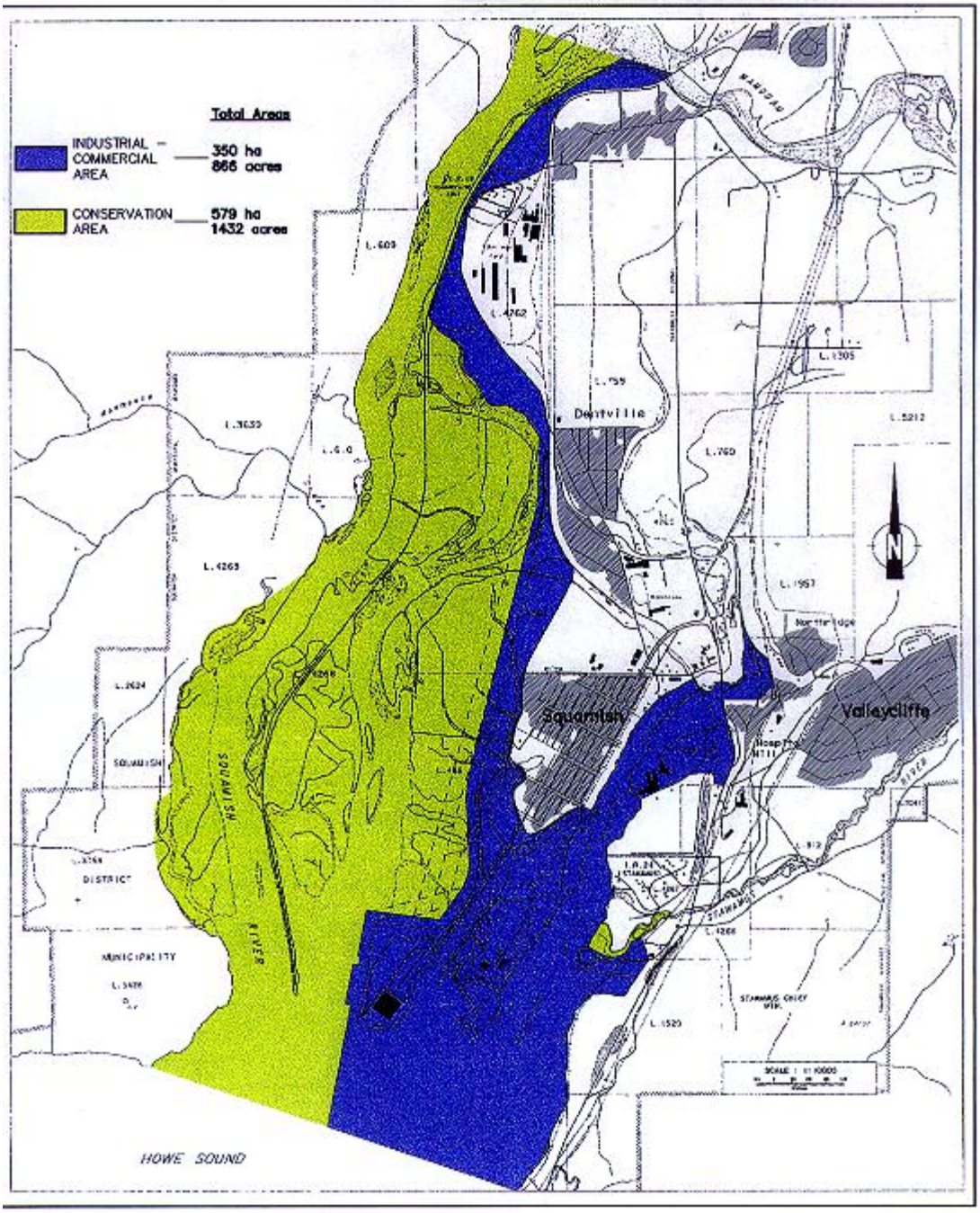
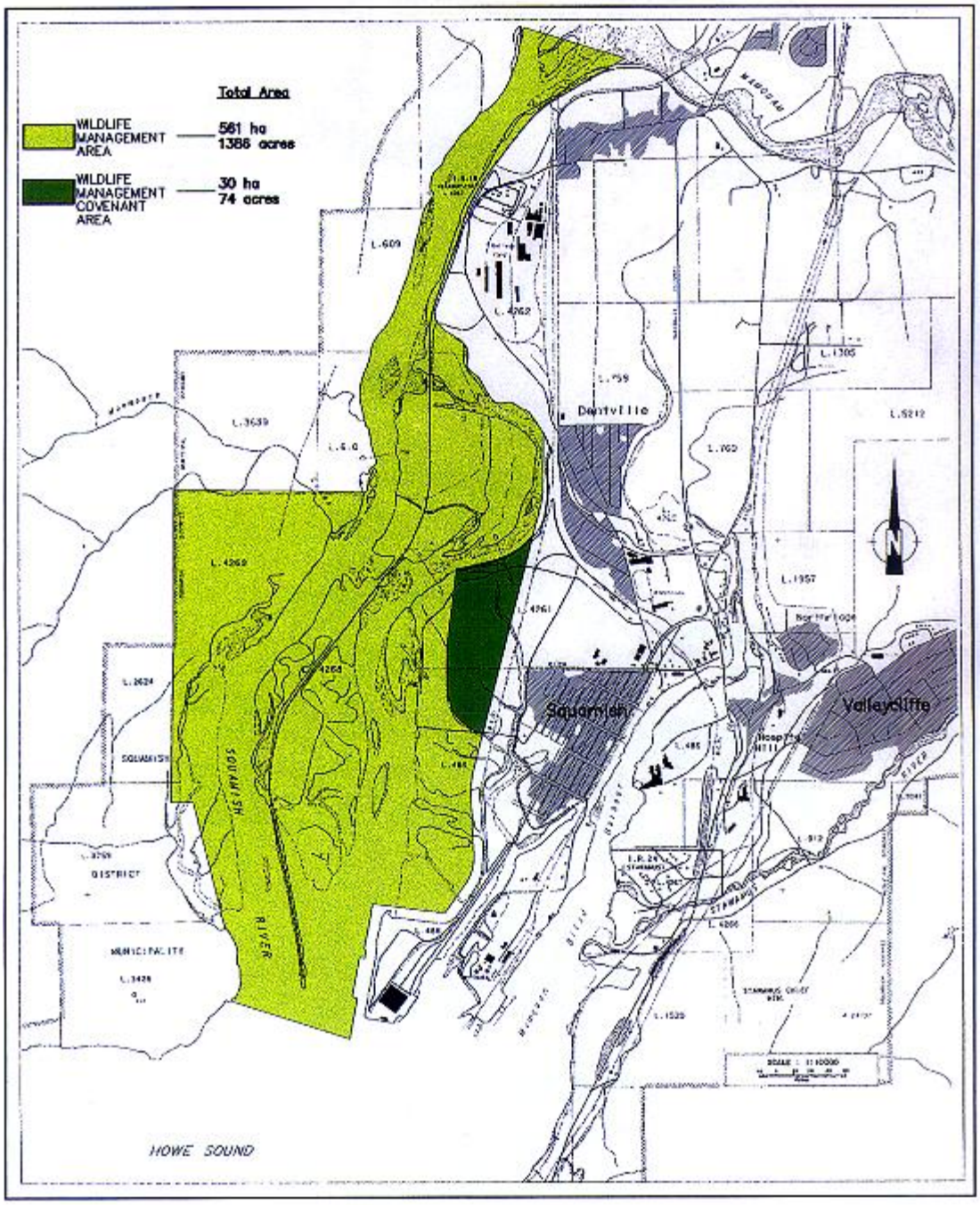
Figure 5 - Conservation and Development Areas



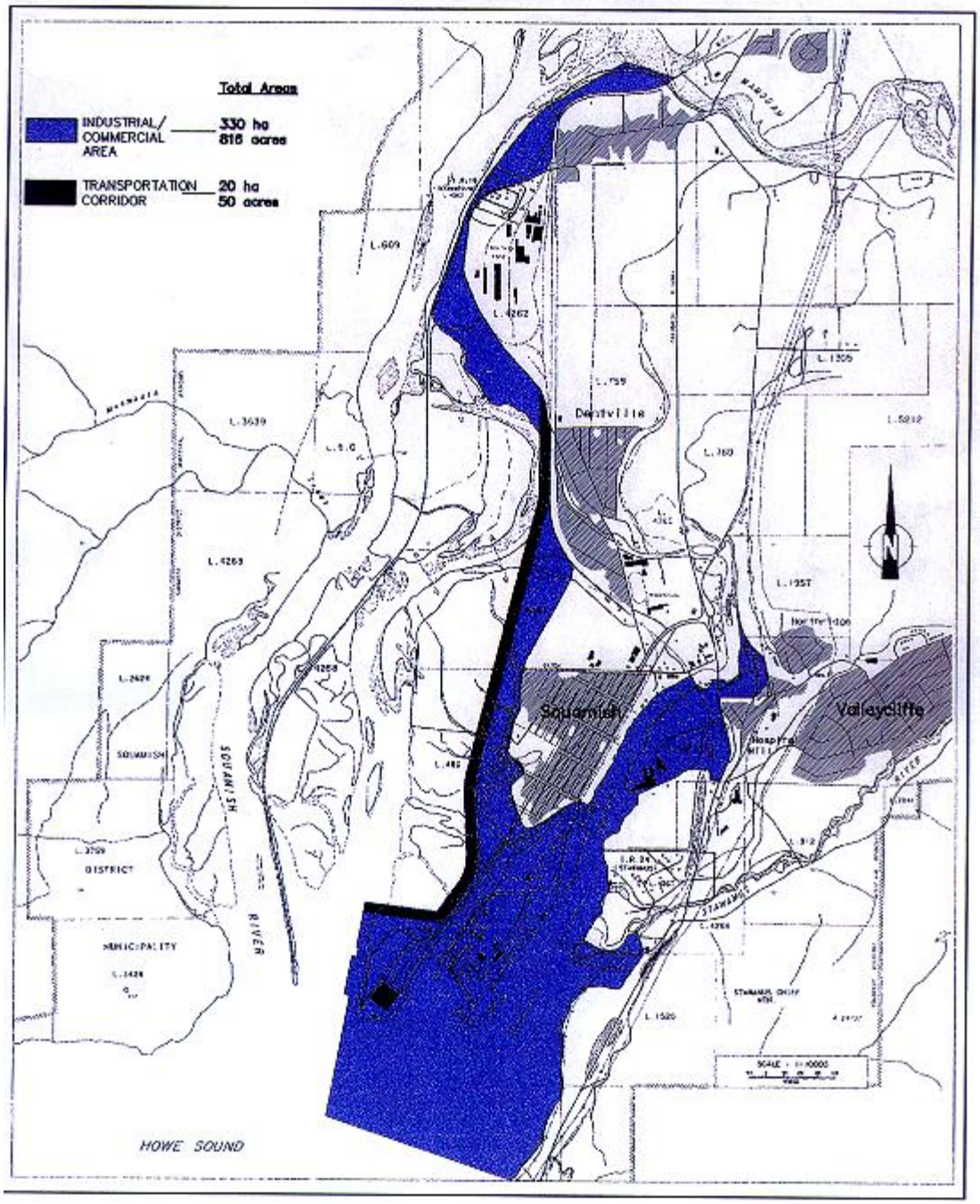
25

Figure 6 - Wildlife Management Area



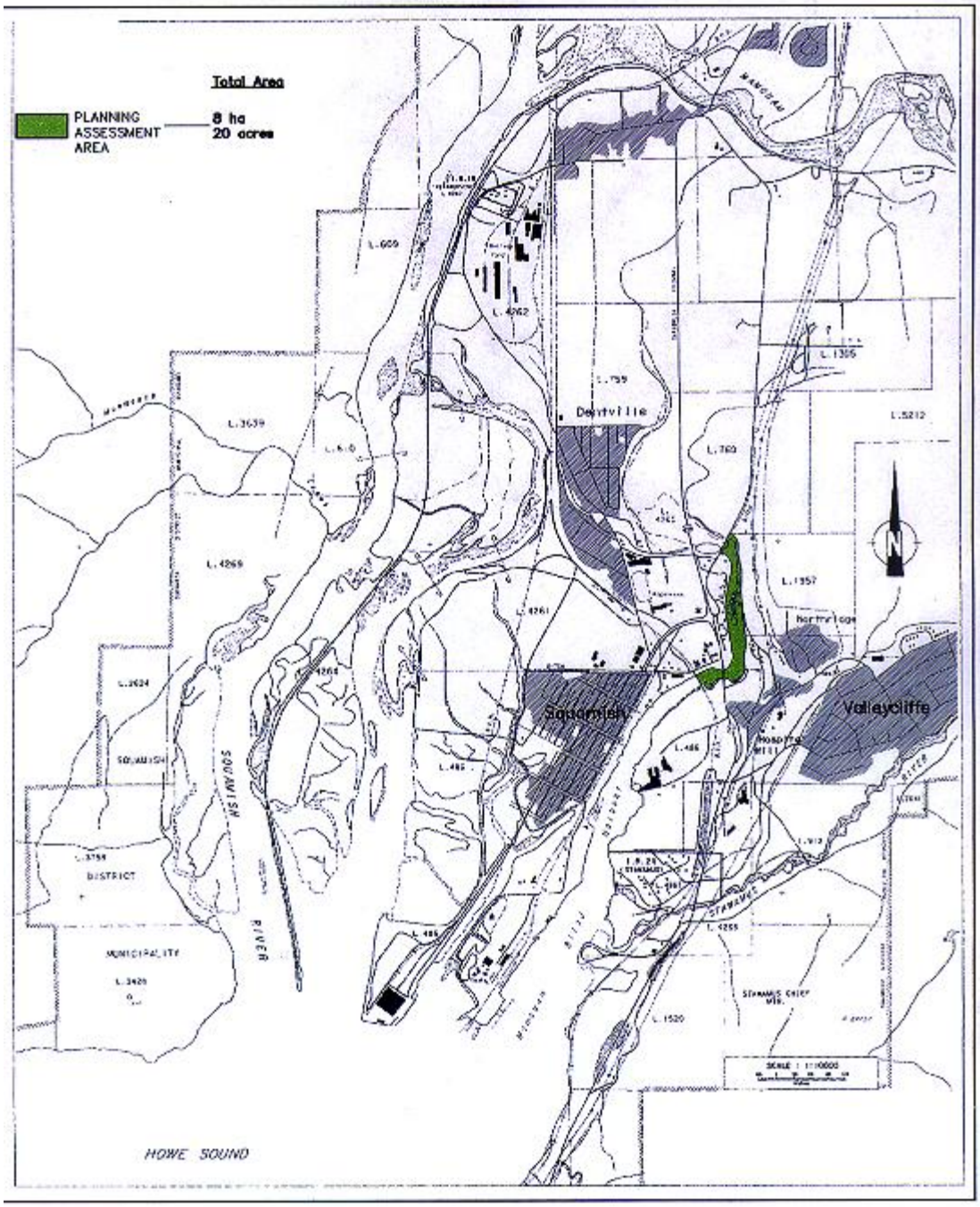
26

Figure 7 - Development



27

Figure 8 - Planning Assessment Area



28

Figure 9 - Habitat Compensation Works

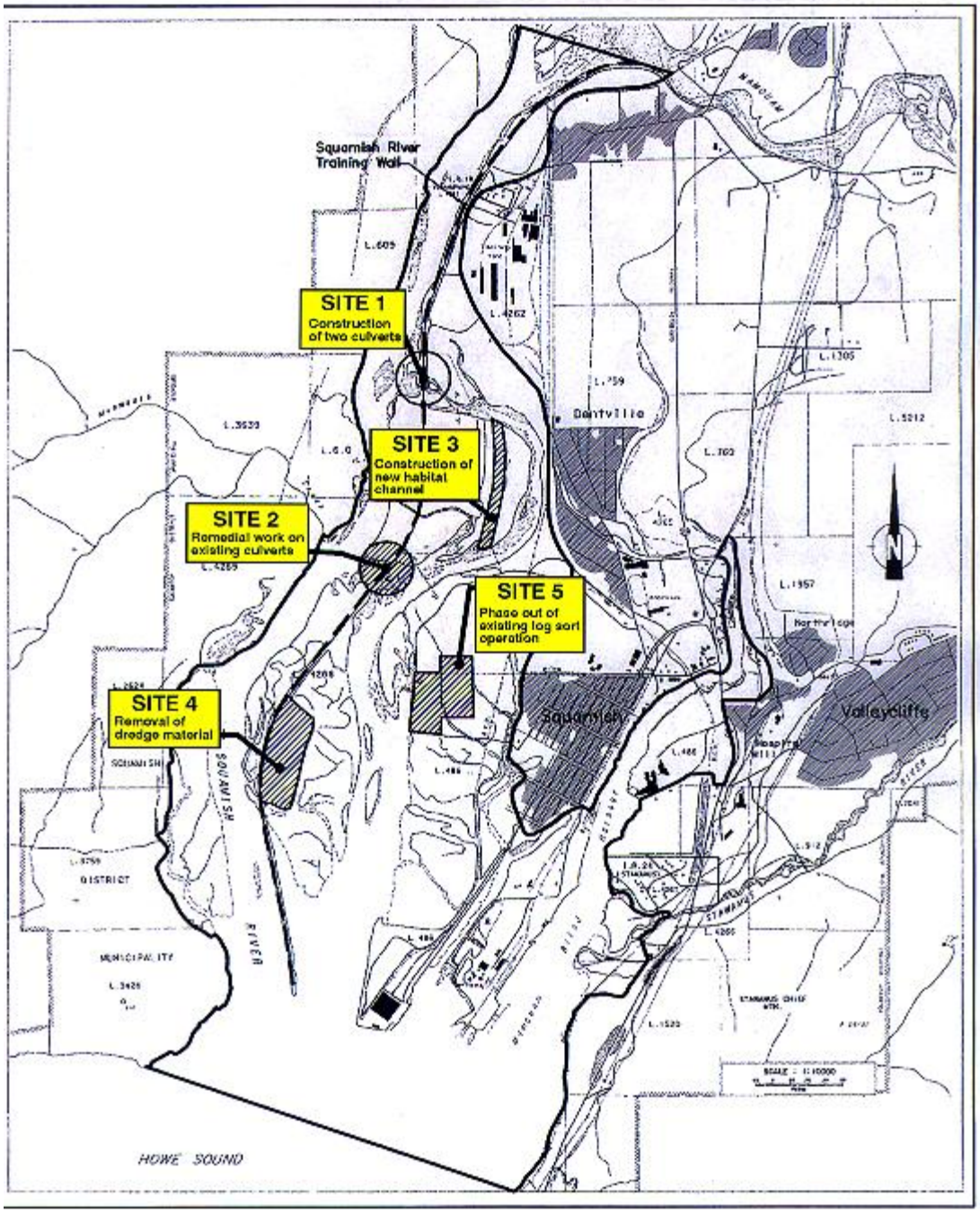


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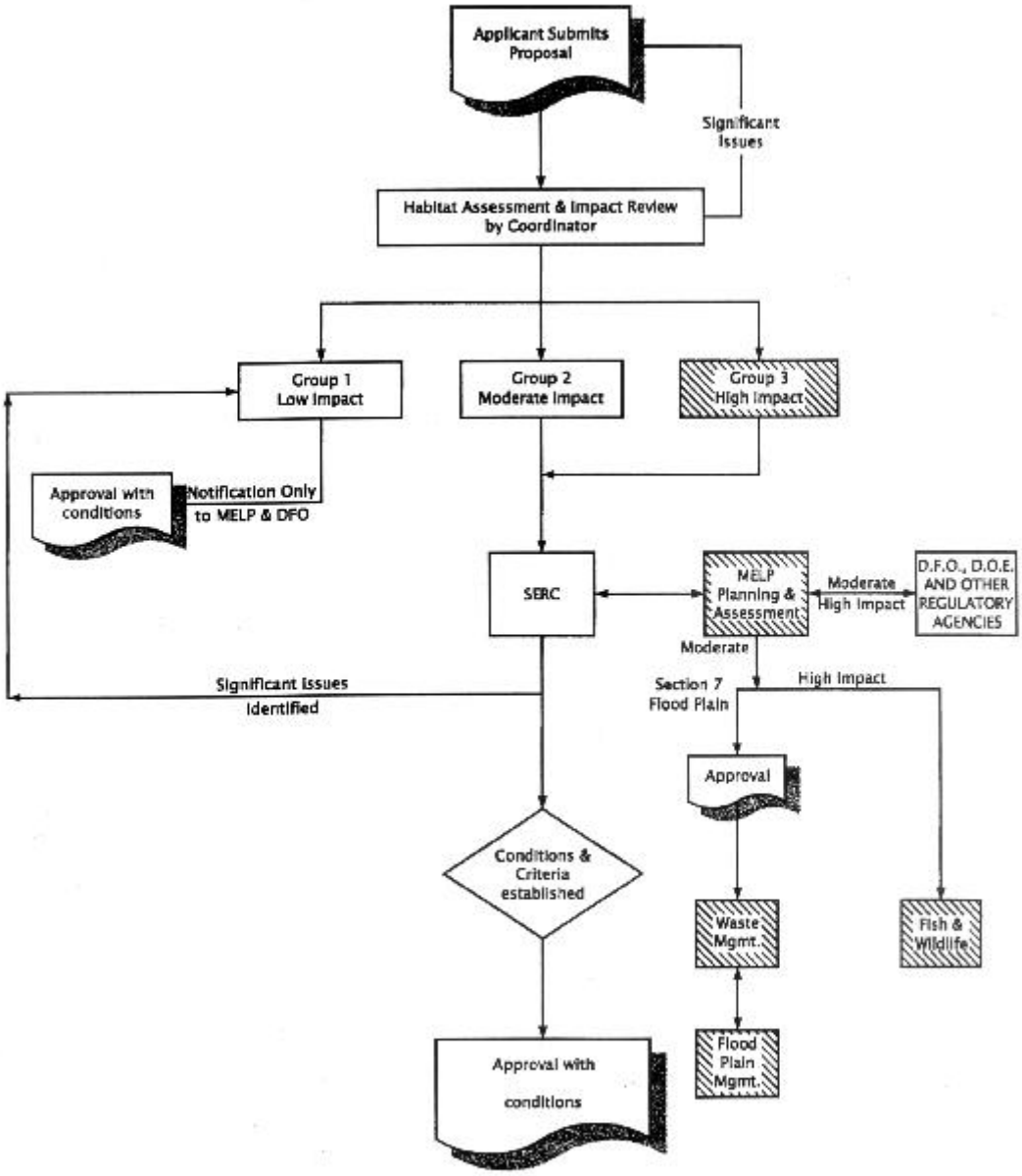
Figure 10 - Environmental Review Process



30

Figure 11 - Land Exchange Program

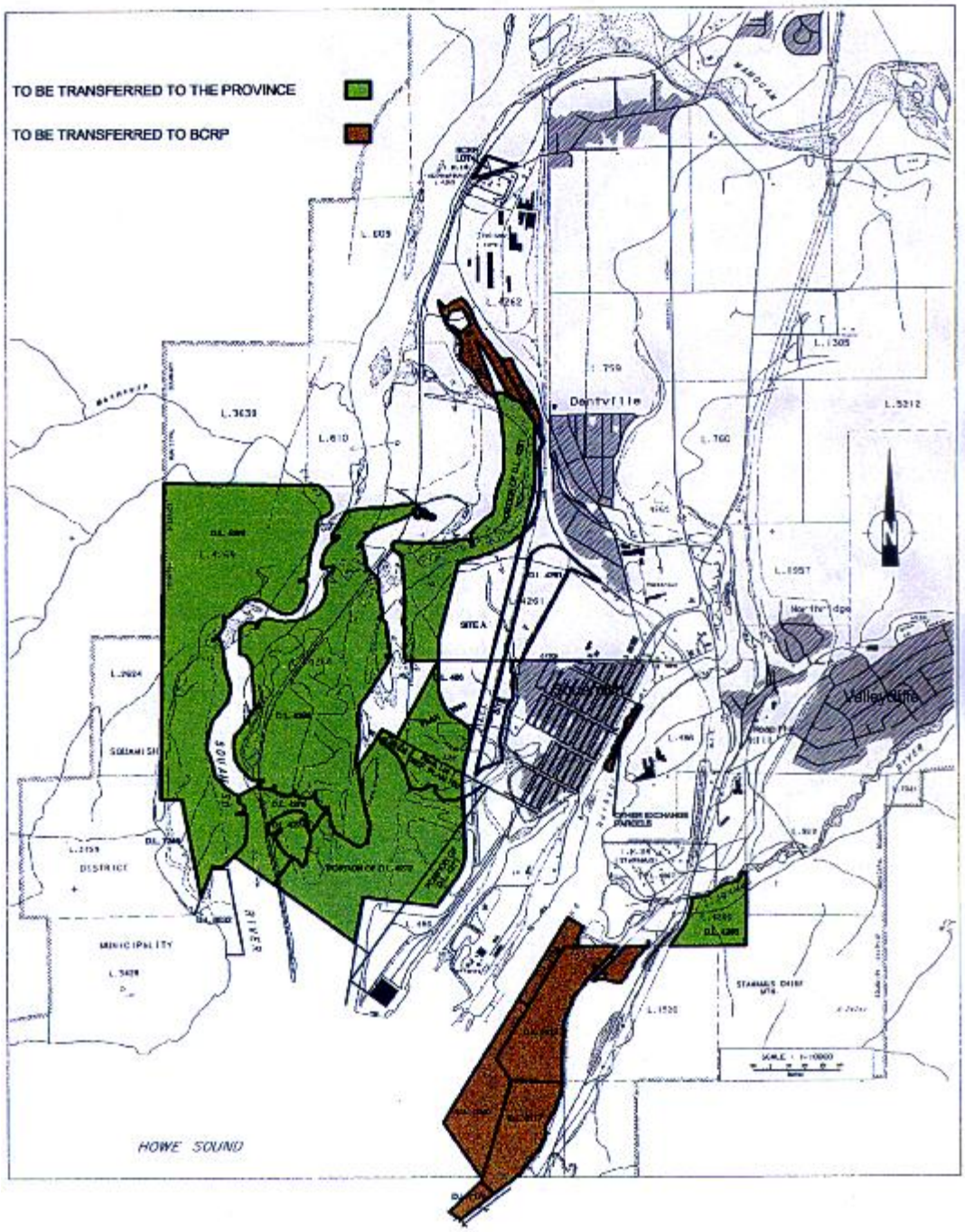


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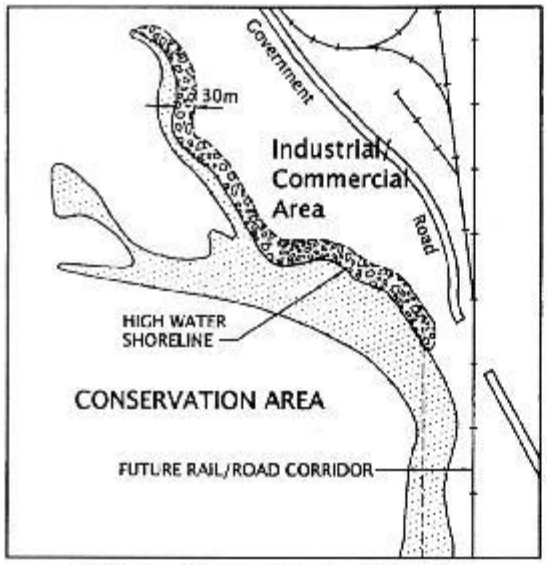
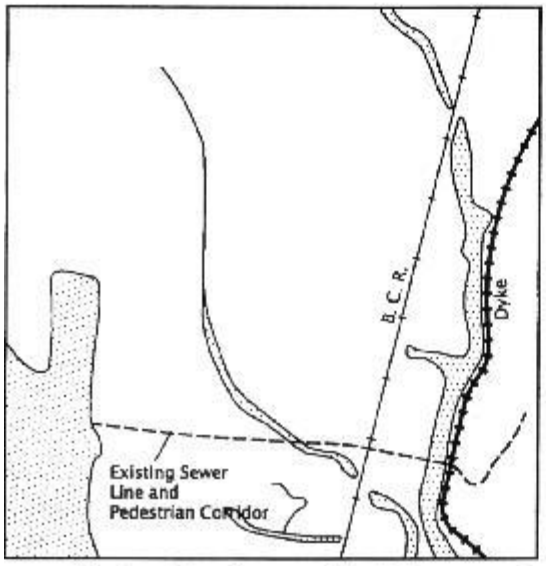
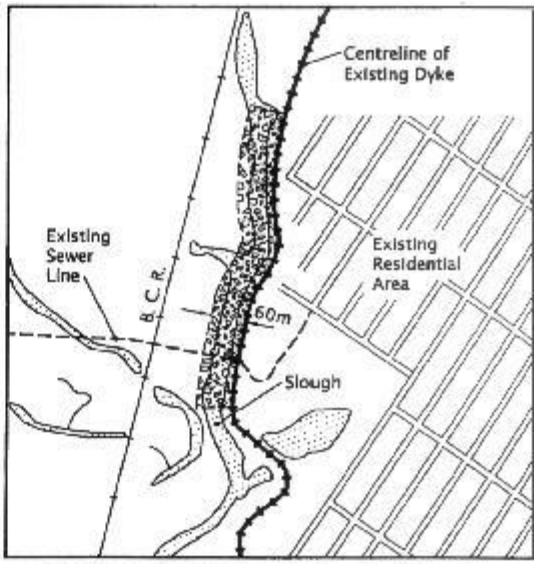
Figure 12 - Buffers and Pedestrian Access



Buffer: Central Basin Slough



Pedestrian Access Corridors



Buffer: Cattermole Basin Slough

All areas are approximate and subject to a detailed survey.

METRES 0 100 500

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APPENDIX I

PROPOSED SEMC MEMBERSHIP

Object: to provide a balanced approach to managing the SEMP, membership should have balance between government and non-government members and between economic and environmental issues,

BC Assets and Land Corporation

BC Environment

BC Ministry of Forests

BC Rail Ltd.

Environment Canada

Fisheries and Oceans, Canada

Representative, Local Commercial Interests

Representative, Local Conservation Interests

BC Ministry of Small Business, Tourism and Culture

District of Squamish

Squamish First Nation

An independent Registered Professional Biologist

Representative, Log Handling Working Group

Representative, Local Recreational Interests

Representative, Academic Community

**The SEMP does not provide for funding for any members.

APPENDIX II

SEMC WORK PROGRAM

The following outlines some of the issues that the SEMC may wish to include in its work program:

1 ask the Squamish Environmental Review Committee, in conjunction with the District of Squamish and other government agencies, to investigate the feasibility of rewatering the upper Mamquam Blind Channel

2 ensure that, if the basin management process is developed by other interests, the SEMC initiatives are incorporated

3 form and work with a local advisory committee on the management plan for the Wildlife Management Area Plan

4 work with the advisory committee to implement the Wildlife Management Area Plan

5 develop a newsletter and enhance the public information exchange process

6 ask the Ministry of Environment, Lands and Parks to report on the sanitary sewage outfall

7 request a review by BC Environment of the options for reducing the aggradation of the Squamish River

8 ask the District of Squamish to review the official Community Plan Transportation Network

9 initiate review of Planning Assessment Area in upper Mamquam Blind Channel

10 ensure that the habitat compensation works are undertaken in accordance with Habitat Compensation Agreement developed under this plan

11 ensure that the habitat compensation works are monitored for their effectiveness, as outlined in the Habitat Compensation Agreement

12 ensure that the West Barr Site is cleared of debris once the West Barr operation closes

13 have the Plan Coordinator develop, in consultation with the SERC, criteria which outlines the types of projects that don't require a formal review

14 have the SERC prepare guidelines for each level of the project review process

APPENDIX III

GLOSSARY

Aggradation The increase in the level of a riverbed as a result of sediment deposited by the river

Alluvial Of or relating to material left by water flowing over land; for example, alluvial deposits are those materials, such as silt and sand, dropped by a river as it flows toward the ocean.

Area Designation The assignment of particular use(s) to a specified location.

BCR BCR Properties and BC Rail.

Brackish Somewhat salty; for example, fresh water mixed with salt water becomes brackish.

Buffer A strip of land which is left in a natural state.

CEAA Canadian Environmental Assessment Act.

Culvert A small tunnel constructed to carry water under a railway, embankment or road.

Conservation The act of protecting from loss, waste, injury or decay.

DOE Department of Environment (also known as Environment Canada).

DFO Fisheries and Oceans Canada (formerly Department of Fisheries and Oceans).

Delta A fan-shaped and nearly flat plain made from alluvial deposits between the branches of a river at its mouth.

Dendritic Channels A name for the smaller river channels that branch off the main river and spread over the delta.

Dredging The process of removing materials such as silt or gravel from the bottom of a water body using various methods, such as scooping or suction.

Ecosystem The interaction of a community of interdependent organisms with its environment.

Effluent Outflow, usually of waste water, from a pipe into a stream or river.

Estuary The mouth or lower part of a river where the river's freshwater current meets and mixes with the ocean's saltwater tide.

Fill Material, such as sand, gravel or earth, placed to change a slope or depression to a raised or level surface.

Fluvial Of or relating to a river.

Foreshore Part of the shore between the high water mark and the low water mark.

HADD Harmful alternative, disruption or destruction (see section 3.2.4).

Habitat The environment in which an animal or plant lives.

Habitat Channel A waterway which is newly created or modified to provide habitat.

Habitat Compensation Agreement The agreement between the Fisheries and Oceans Canada and BCR which outlines how BCR will compensate for expected fish habitat loss as a result of industrial and commercial development.

Hectare A metric unit of measurement; equivalent to about 2.47 acres.

Implementation Coordinator Replaced by the Plan Coordinator.

Information Bank A collection of project information and correspondence related to the Squamish Estuary Management Plan available to the public at the Squamish Public Library.

Intertidal Zone Of or relating to the marine or estuarine foreshore,

Lead Agency The government body primarily responsible for completion of an activity such as the implementation of a management plan.

Metre A metric unit of measurement; equivalent to about 39 inches.

Mitigation Action taken to avoid or reduce adverse impacts.

Plan Coordinator Representative from the District of Squamish who assists the Squamish Estuary Management Committee with administrative tasks, and who is also a member of the Squamish Environmental Review Committee.

Referral System Process by which a government agency passes a proposal on to other agencies (usually government) for review.

Rewatering Adding water to an area previously partially or completely drained.

Riparian Pertaining to or situated on the bank of a water body.

River Mouth Where the river meets the ocean.

SECC Squamish Estuary Coordinating Committee (see Section 1.2; with implementation of SEMP, SECC will be replaced by the SEMC).

SEMC Squamish Estuary Management Committee (see Section 4.1).

SEMP Squamish Estuary Management Plan.

SERC Squamish Estuary Review Committee (see Section 4.1).

Sub-tidal A region located below the low water mark in a tidal area.

Tenure The holding of an office or land for a specified period of time.

WMA Wildlife Management Area (designated under the BC Wildlife Act) under the provincial Wildlife Act, the primary purpose is bio-diversity, It

does not necessarily exclude any other activities, i.e., rights of ways, but such activities require Regional Wildlife Manager, MELP, approval.