F.1 OFFICIAL COMMUNITY PLAN AND DEVELOPMENT PLANS OF OWNERS

Yong Dong Xi

The original Official Community Plan of Britannia Beach is part of the Whistler South Official Community Plan (OCP) Bylaw No. 495, 1994, and the most recent one is Electoral Area D Official Community Plan Amendment Bylaw No. 714, 2001. In this period, the study of the area provides many opportunities with respect to future land use, including:

- a stunning waterfront location offering spectacular views,
- road and rail access up the Sea-to-Sky corridor,
- rolling developable land close to the waterfront,
- mountain valleys with swiftly flowing creeks,
- a historic mine and townsite at Britannia, and
- extensive resource lands.

As well as significant constraints, including:

- acid rock drainage and contaminated deposits resulting from the previous mining activity.
- unstable geology that can cause flooding and debris flows along creeks.
- numerous steep slopes that vary in stability,
- steep land rising to high elevations close to the shoreline,
- riparian areas and other environmentally sensitive resources,
- archaeological sites,
- highway, rail and utility corridors that form barriers to public access, making potentially developable land too expensive to access, and
- ongoing forestry activity.

The land use designation of the Britannia Beach area is hereby changed from Special Planning Area to Planned Community.

The 2001 OCP contains policies respecting: the heritage values of Britannia Beach, and the importance of enhancing the visual quality along Highway 99. Public consultation indicated that there is interest in maintaining views of Howe Sound; ensuring public access to the shore; encouraging commercial buildings that are compatible with the heritage theme; and ensuring that buildings blend in with the environment. The following policy statements reflect the desired direction for land use in 2001 OCP.

Vision…

Reality…

In Britannia Beach, vision and reality are reflected the concern about the heritage values, visual quality, tourism, waterfront, and environment.

Vision:
Respects the natural environment; promotes the historic aspects of the community and a "sense of community"; promotes connection with the other communities and patterns of growth in the Sea-to-Sky corridor; promotes tourism, outdoor recreation potential, film industry use, and the waterfront as a destination for residents and tourists. Focuses on livability for residents with appropriate parks, local services, and community facilities.

Residential:
Encourage the development of a variety of densities and housing types; reinforce the historic townsite; plan for residential use only where there are no hazards or environmentally sensitive areas, or where hazards can be adequately mitigated; provide total1650-2000 residential units for about 4000 people.

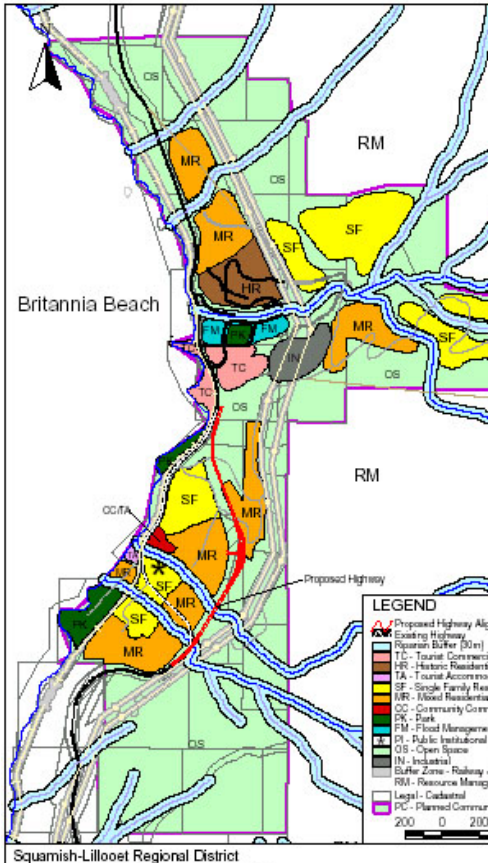
Parks and Open Space:
Encourage provision of public pedestrian access to and along Howe Sound possible, and a variety of recreational parkland to meet community needs. Encourage provision of a trail system throughout the community and alongside environmentally sensitive areas where possible, and natural open space in all environmentally sensitive areas, hazard areas, and the upland remainder which are not intended for future development.

Commercial and Industrial:
Promote tourist commercial business, in particular the adaptive reuse of heritage and historic buildings, and non-polluting commercial and industrial. Encourage building forms and designs which help to promote use of the community as a commercial filming location.

Transportation:
Support and encourage a transportation planning study to determine how best to provide safe pedestrian and vehicular access across Highway 99 with minimal disruption to the proposed townsite development. Encourage and support opportunities for public transit, including improved rail and bus service for commuters and tourists.

Heritage Resources:
Encourage the protection and preservation of existing heritage resources. Support the efforts of the Maritime Heritage Society in establishing a maritime heritage precinct at Britannia North, and the Britannia Beach Historical Society in maintaining a heritage precinct at Britannia North.

Environmental issues:
Encourage the protection and enhancement of existing environmental resources. Support and encourage the remediation of acid rock drainage, the removal and containment of contaminated rock, soil or tailings, and the limitation of public access to mining hazards. Consider incorporating into the subdivision servicing bylaw stormwater management provisions consistent with the guidelines in this plan. Support and encourage the preparation of a Management Plan for Britannia Creek to balance flood prevention with fish habitat concerns.



F.2 FLOOD CONTROL OBJECTIVES AND STRATEGIES

Jennie Suen

The Britannia Beach Community has historically experienced periodic destructive floods resulting in catastrophic property damage and in some cases loss of life. Within the past century, debris floods of 1906, 1921, and 1991 are notable. In the 1921 flood event, 37 people died, 15 were injured and 50 of the 110 houses on site were destroyed. But even though the potential still exists for flooding, the community has continuously rebuilt itself onto the same location. The 2001 OCP for Britannia Beach, recognizing the flood hazard, will restrict building and building types on the Britannia Fan (figure 2). The OCP divides the fan into a flood management, open space, park and tourist commercial zones. This will help mitigate losses should another flood event occur. However, protection of the Sea to Sky Highway and railway should also be kept in mind, because they are important transportation links.

Figure 1: Before and After the 1921 Debris Flood (Source-BC Museum of Mine Mining)

F.2-1 FACTORS LEADING TO FLOODING

Regarding flooding events, important to note about the Britannia Watershed are the middle and lower slopes of the valley that hold a blanket of relatively loose glacial deposits, producing talus and alluvial debris fans which dump into the stream draining the valley. The upper reaches of the watershed, especially Jane and Marmot Creek are seen as a constant source of material for debris floods, torrents, and flows.

In the 2002 *Britannia Creek Flood Risk Assessment* Report, the Britannia Creek is classified as a torrent stream, typical of mountain streams of the area. The report states "(o)ne of the main characteristics of torrents is the episodic and exceptional flood flows, usually accompanied by very high sediment loads (16)." In addition, the report indicates that the Britannia Watershed has a response time of 1 hour due to the small size and the steepness of the slopes and therefore is a greater danger during higher intensity, short duration rainfall as may be seen during local warm convective storms (April to October). The floods of 1921 and 1991 are examples of flooding which occurred during such a storms. The report also indicates that a flood-producing storm can result in as little as 30 minutes of intense rainfall.

In the past, debris/water dams, which still exist, have been built along several locations along to the major stream bed to facilitate power generation for the Britannia Mine, provide a source of potable water, and also to help protect various sites from floods. At this time, the Tunnel Dam and the Lower Dam sit in-filled with material, the former due to a failure of the higher dam during a 1989 control debris flood event.

Figure 2: Taken from 2001 OCP Britannia Beach Land Use Plan, Partial

F.2-2 FLOOD MITIGATING OPTIONS

Future measures to prevent flooding have been examined in the 2002 report and four options are presented to manage debris floods. Options were designed for a 200-year storm event that will release into flood 35,000 cubic meters of material. As reference, the 1991 flood produced an estimated 31,000 cubic meters of material washing out 50 structures located on Britannia Fan and part of the Sea to Sky Highway. Options were assessed according, to name a few, initial cost, maintenance cost and ease of maintenance and effect upon community.

Option 1 and 2 involve adding a structure to the part of Britannia Beach that sits on the Britannia fan. Hence, both designs affect in some way the physical pattern of the community. In Option 1, a sediment basin large enough to trap the 33,000 cubic meters of material is constructed along the lowest reach of Britannia Creek. It would widen the creek bed from 10 meters to 55 meters. Figure 3 shows the extent of the structure and its cross-section. This option does not have a high initial cost, has a relatively low impact on the community, and low maintenance cost. However, it should be noted that this design would destroy what little natural ecology exists in the streambed today.

Option 2 creates a set back dyke along the south and east corner edge of Britannia Fan (Figure 3). The dyke would allow flooding to occur over Britannia Fan, while protecting the Sea to Sky Highway and the Britannia Mining Museum. This is the least expensive option and has virtually no maintenance cost, but if flooding does occur, it will be the most expensive to the small community. Ecologically, it is rather benign and might be an added greenway feature that would enhance the area.

Options 3 and 4 occur above the Britannia Beach community, and hence there would be little effect upon the community. Each involves utilizing a dam structure. With this in mind, it would be good to incorporate green dam practices which have been discussed earlier. They might also be designed to support hydropower, re-cooping initial cost of retrofitting Option 3 and building Option 4, respectively.

Option 3 utilizes the existing Tunnel Dam as a means of trapping future flood debris. The dam would need to be retrofitted to standards for a 200- year storm event and the in-fill debris, which exists at this time, would need to be removed. This option is the second most expensive and would also require periodic maintenance in a difficult location, upping the cost.

Finally, Option 4 is the most expensive, creating a new debris dam below Tunnel Dam. Although easy to construct, the dam will be difficult to do periodic servicing due to its relatively inaccessible location.

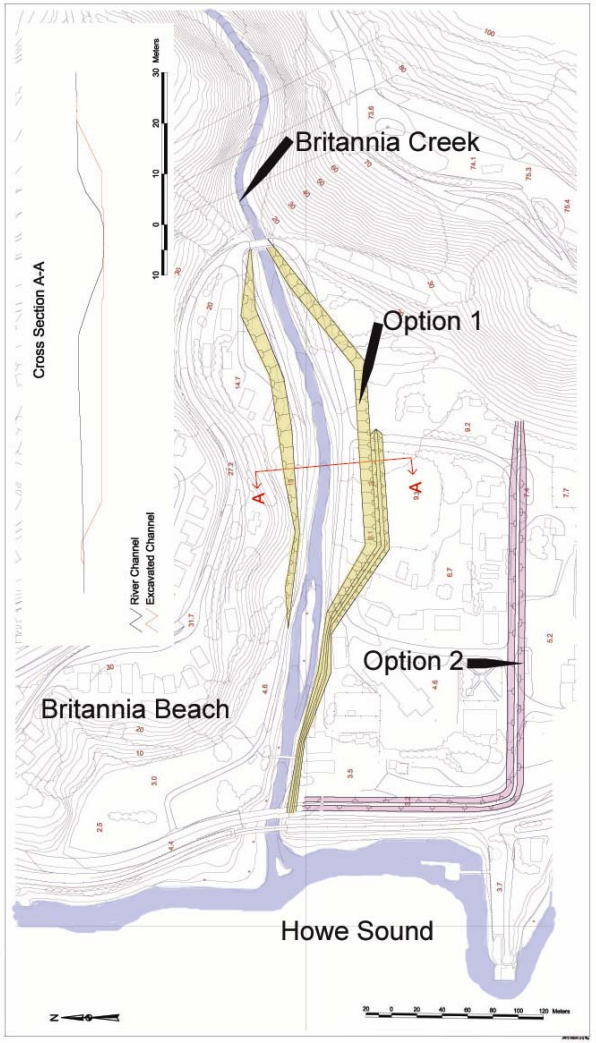


Figure 3: Illustration of Options 1 and 2—would not be used in combination together.
(Source Base Image-2002 Britannia Flood Risk Assessment Report)

References:

Squamish-Lilloet Regional District, Electoral Area D Official Community Plan Amendment Bylaw No. 714, 2001.

Water Management Consultants, Britannia Creek Flood Risk Assessment Report, July 2002.

F.3 EXISTING ECOLOGICAL PROTECTION OBJECTIVES

Tobi Fenton

Ecological protection at Britannia Beach is addressed in the Squamish-Lillooet Regional District Bylaw No. 714, 2001, which functions as the Official Community Plan (OCP) for Britannia Beach. One broad ecological objective is presented:

- To encourage the protection and enhancement of existing environmental resources.

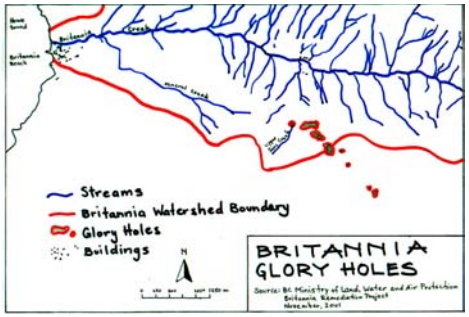
Several more specific policies are then offered as a means of achieving that objective. These policies include:

- Protecting and enhancing streams with 30 metre setbacks according to the B.C. Fish Protection Act;
- Assessing the environmental sensitivity of an area prior to development, and specifically addressing unique, rare, or endangered wildlife habitat, migration corridors, fish habitat, and vegetation;
- Identifying sensitive areas which will not be developed including stream corridors; and
- Promoting community education to encourage environmental stewardship of sensitive areas.

Beyond these policies, guidelines are suggested for protecting ecologically sensitive areas including streams, significant vegetation and wildlife habitat. For example, streams are to be crossed with bridges where possible, not culverts; development work should be timed to avoid disturbing fish migration and spawning or bird nesting; and existing vegetation is to be maintained as much as possible by:

- planning open space around mature forest stands;

Streams are to be crossed with bridges to minimize disturbance of vegetation, and are to have a 30-metre setback.



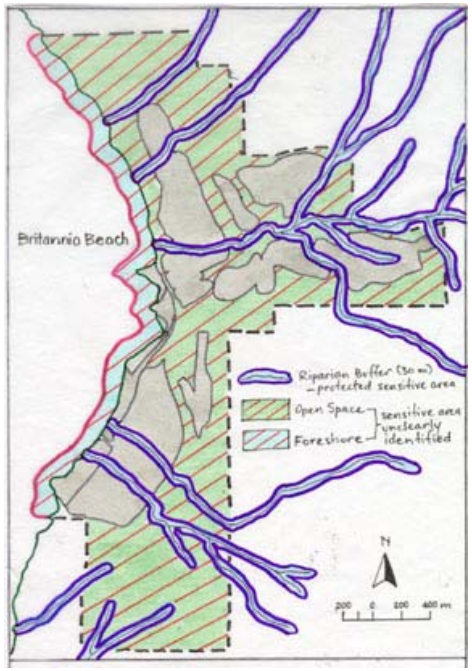
Current source of groundwater pollution is acid rock drainage from glory holes above Britannia Creek.

- minimizing clearing during road construction by following natural contours;
- protecting veteran trees;
- protecting raptor nests with a 50-metre buffer; and
- keeping building foot prints small.

Aside from the 30-metre riparian buffer, the 2001 OCP does not identify specific ecologically sensitive areas such as mature forest stands or individual trees, raptor nests or unique wildlife habitat. The extent to which theses have been surveyed and mapped – if at all – is unclear.

Two issues which are particularly relevant to Britannia Beach, which the OCP does not address, are foreshore and groundwater protection. The Britannia Mine Stakeholders' Sustainable Reclamation Plan proposes to "assess the ecological impact of contaminated groundwater," and if it is a problem, to implement remediation.[1] The B.C. Ministry of Sustainable Resource Management has proposed strategies to prevent discharge of the groundwater polluted with the acid rock drainage that is seeping from glory holes[1], however these measures are not evident in the OCP policy. Given that the OCP has identified fish-bearing streams as worthy of protection and enhancement, then the foreshore area, too, deserves attention, as it is a crucial zone for salmon undergoing the salt-to-fresh water adaptation during their migration to spawning streams.

In summary, the Britannia Beach Official Community Plan recognizes the need for ecological protection and enhancement in its policies and proposed land use plan. However, beyond mapping riparian buffers in the land use plan, it does not identify specific ecologically sensitive resources that require protection, such as crucial wildlife corridors, foreshore habitat, or groundwater. Identifying these features will provide a much more complete view of what sensitive habitats need to be protected at Britannia Beach.



Streams are protected in the Land Use Plan, but not groundwater or foreshore habitat.

Britannia Beach Foreshore

F.4 PROVINCIAL AND REGIONAL ECONOMIC DEVELOPMENT OBJECTIVES

Theresa Cherniak

The land area from West Vancouver to Whistler, generally following the Highway 99 corridor, is governed by a number of jurisdictions with different plans and policies. The Provincial government, Resort Village of Whistler, District of Squamish, and Squamish-Lillooet Regional District all have interest in and responsibility for economic development within portions of this region.

The two major economic development opportunities in the next ten years both for the province and for this region, however, are beyond the scope of these individual jurisdictions. They are the 2010 Vancouver/Whistler Olympics, and improvements to the Sea-to-Sky Highway. The Provincial Government and the local jurisdictions supported the Olympic bid, and the Province will participate financially to some extent in hosting the Games and funding the Sea-to-Sky improvements. In addition to these, there are a number of other planned projects that will further develop the area as a destination – primarily in the Squamish and Whistler areas north of Brittania Beach. These include a new Sea-to-Sky University slated to accept students in 2005, a new Resort development - Garibaldi at Squamish - proposed for the mountains north of Squamish, and Squamish Port development.

The 2010 Olympics is one of the two major economic development opportunities in this region over the next 10 years.

Regional economic drivers

Tourism and recreation is the major employer (40%) and income producer in the region. Tourism spending in the Sea-to-Sky corridor is estimated at over $1 billion per year. Forestry has historically been important in the area, but now accounts for only 12-13% of employment and income. The public sector and construction make up the remainder.

Most of the tourism activity for the region is in Whistler, though one study estimated that 20% of expenditures made by those travelling to Whistler occur elsewhere in the corridor and the SLRD. This would include many of the trips to the Mining Museum and other destinations in Brittania Beach.

2010 Olympics

The 2010 Olympics and Paralympics will be held in venues in Vancouver, Cypress and Whistler. Alpine Skiing, and Nordic, Sliding and Paralympic sporting events will be held in the Whistler area. Numerous facilities will be constructed in Whistler and surrounding areas, including a Nordic Center in Whistler and an athlete's village in the Callaghan Valley. During the Games, 17,000 visitors are expected each day in Whistler. According to Olympic Bid documents, the 2010 Winter Games are expected to be a major economic engine in the region over the next 7 years –

generating up to $10 billion in direct and indirect economic activity. Much of this will occur during construction of the venues. Additionally, the facilities constructed for the Olympics will be used afterwards for training and sports events, generating continuing economic activity in the area.

Sea-to-Sky Highway Upgrade

Improvements to the Sea-to-Sky Highway (Highway 99) are planned for the 95 km stretch from Nelson Creek Canyon to Whistler. Justification for the improvements include high accident rates, poor travel speeds and congestion through urban areas, limited reserve capacity during peak periods, and reliability problems due to natural events. Construction is scheduled to begin in 2004 and be completed in 2009, in time for the Olympics. Winning the Olympic bid is the main driver for the timing and perhaps extent of the improvements. Principal results will be reduced travel times and improved safety – shaving off about 17 minutes in 2010.

In the absence of improvements, population in the entire Highway corridor was expected to double from about 34,000 to 67,000 between 2001 and 2025. The Highway improvements are expected to result in a population of about 11,000 additional people by 2025, fuelling additional economic development including residential and business growth. Additionally, by reducing travel times and increasing safety and reliability, the improvements are expected to promote further growth of tourism. While the majority of tourists are heading to Whistler and the surrounding recreational areas, the neighboring communities can be expected to benefit from the increased tourism activity and possible additional development as Whistler becomes more crowded and development potentially spills into surrounding communities. Industries dependent on transportation, such as forestry and agriculture, will also benefit from improved access to markets.

Currently the Highway improvement project is in the initial stages of Environmental Assessment, though it does appear a preferred alignment has already been chosen and the extent of improvements has already been decided. Upgrades include the addition of lanes in some portions, and safety and reliability improvements in all areas, including slope stabilization and providing additional passing opportunities. The majority of the improvements will be done along the existing highway alignment, however, there are several options for the alignment at Britannia Beach, which are discussed in Section D.4. This Highway is the main artery providing the economic lifeblood to the communities in the Sea-to-Sky corridor. Changes in access to the community from the Highway will affect the economic development and potentially the viability of the community.