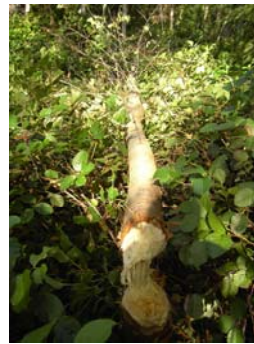


# Management Plan

## “Great Beaver Swamp” district lot 61/7

Prepared for the Galiano Conservancy Association by Sabine Luning\*  
Galiano Island, B.C.



December 06 – January 07

\*As a practical semester for the study of Landscape-management at the  
University of Applied Sciences, Osnabruck / Germany

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## **1. Introduction**

The main purpose of the Galiano Conservancy Association is 'to preserve, protect and enhance the quality of the human and natural environment of the area' (Part one of its Constitution). The latest acquisition of the Conservancy is the Great Beaver Swamp property, which is a wooded land with a large wetland shaped through beaver activities. Before doing any improvements or actions on the land, the conservancy wanted to know what are the current conditions and features of this property. This was provided through a baseline report for the Great Beaver Swamp/district lot 61/7. This management plan documents the goals and objectives and possible actions for the Great Beaver Swamp to enhance and preserve its natural values. This management plan was approved by the Galiano Conservancy membership at its annual general meeting on 30 June 2007.

## **2. Plan purpose**

The purpose of this management plan is to articulate the management objectives, goals and actions, needed to be done to protect the wetland as an important wildlife habitat, to conserve the site in a natural state and to manage interactions of public uses without damaging sensitive ecosystems. This plan contains a description of the biophysical, human and regulatory inventories, to make decisions and set goals for improvements of issues like protection, education, restoration, monitoring, visitor use and access.

## **3. General description**

The property with 18.12 ha (45 acre) in size, is located in the middle of Galiano Island, north of Melissa Road, approximately 14 km by road from Sturdies Bay Ferry Terminal.

It is legally described as Lot 7, District Lot 61, Galiano Island, Cowichan District, Plan 37526 / Parcel Identifier No. 001-034-081

It is currently zoned as rural (R2) and there are no buildings or other improvements on site.

#### **4. Environmental significances**

The Great Beaver Swamp property is a wooded land with a wetland in the form of two beaver ponds. The ponds are currently shallow water with changing water levels, due to precipitation and beaver activities. A number of trees died of a rising water table and are now important feeding and breeding habitats for birds, like woodpeckers, and different species of insects.

The riparian zone is a dynamic ecosystem with its transitional zone between aquatic and upland habitats and changing water levels, which provide primary food sources as well as sites for nesting, breeding and cover for a variety of species of both zones.

The surrounding young forests have certain functions as buffer zones for the wetland and are retreat areas and habitats for a number of wildlife species.

#### **5. Planning process**

Previous to the management plan, a baseline report has been compiled to provide basic information about history, land use designation, by-laws and biophysical conditions. Detailed field data of vegetation species, communities and wildlife has been collected. This baseline information has been presented to the Conservancy staff on December 15<sup>th</sup> 2006.

On January 7, 2007, 20 people, (neighbors and Conservancy members), have met on site at the Great Beaver Swamp property to gather, discuss and locate planning ideas for District lot 7.

On January 13 a publicly advertised open house took place at the Conservancy office. Ten people of the Galiano community came by and commented on those planning ideas.

#### **6. Project history**

To protect the Great Beaver Swamp as a headwater of Beaver creek, influencing the Pebble Beach reserve, increases the value and completes the conservation of an entire wetland complex including Pebble beach Reserve and Laughlin Lake (see figure2). Ronald Pither and Martin Frost wished to sell

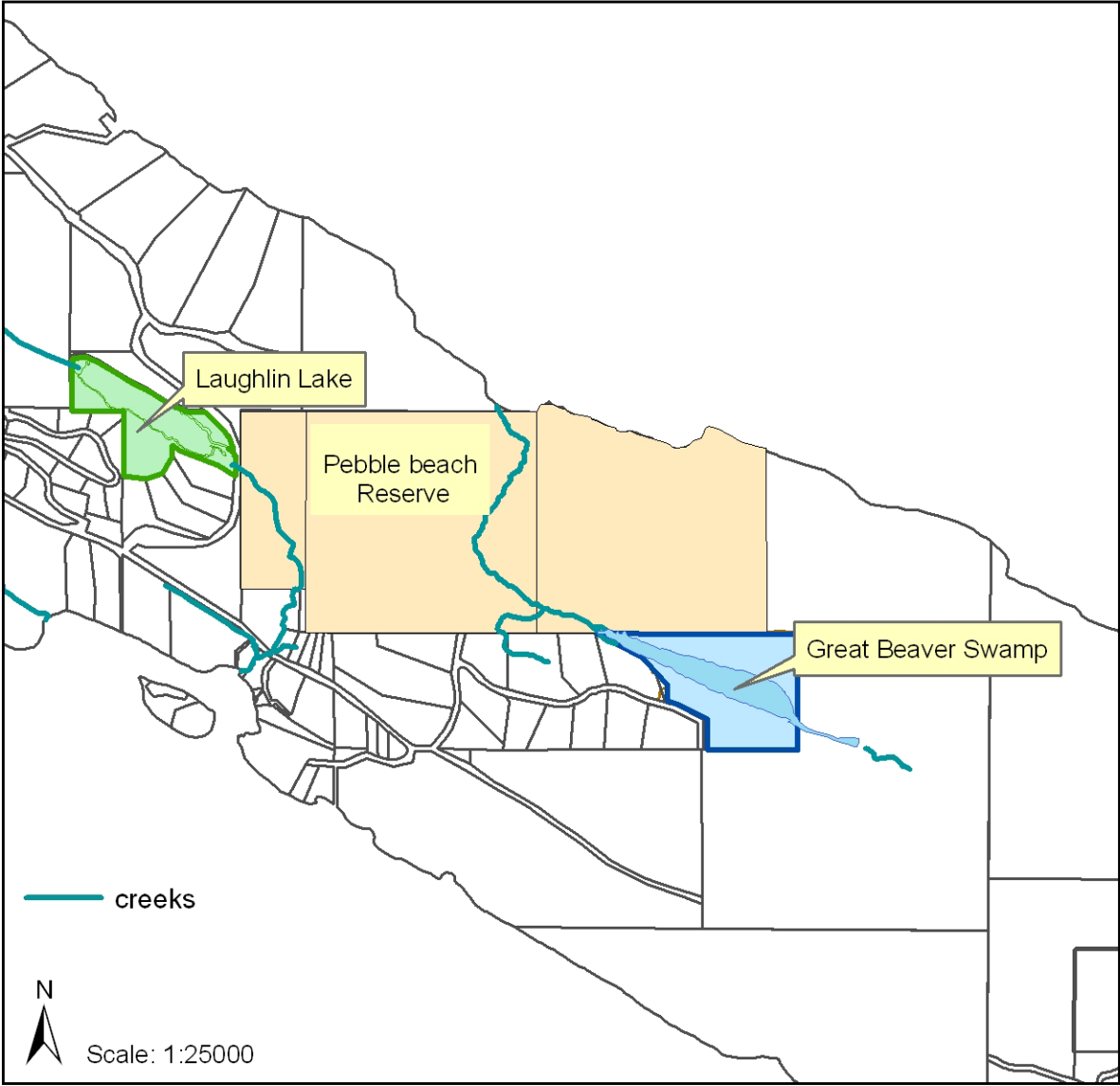


Figure 1: protected areas with creeks, influencing the aquatic value of Pebble Beach Reserve

lot 7 to a conservation organization. After an appraisal of the property through D.R. Coell & Associates inc. in 2002, the Galiano Conservancy Association purchased the property lot 7 for \$185,000 in June 2003. Two thirds of the total purchase price was covered through two supporters of the project who have offered interest free loans towards the purchase. Besides private donations there were organized several fundraising events like an "evening gala" with the author Terry Glavin (30<sup>th</sup> September 06), and two tea party auctions. An art auction will be organized in May 07.

## **7. Goals and Objectives**

The management goal of this plan is to protect the existing natural ecosystem, to provide environmental education, to provide accommodation for future volunteer interns and to monitor the changing process of the "Great Beaver Swamp".

Protection: Protect and preserve natural ecosystems, especially the wetland and its shore to prevent damage and development.

Restoration: Remove invasive species to prevent further spreading and damage of native plant communities.

Education: Provide and improve facilities and conditions for educational programs and extend those programs.

Monitoring: Monitor aspects like flora, fauna and water to document the changing process of the Great Beaver Swamp.

Access: Improve and define trails for the use of public and educational programs.

Visitor use: Provide access and recreational value for the general public without damaging natural ecosystems.

Buildings: Provide accommodation for seasonal interns of the Conservancy.

## **8. Ecological inventory**

### **8.1 Natural history**

In 1930 it was a wetland with open water and the forests were intact. In 1950 a logging road was established and the forest north of the swamp was logged. In the following years the forest was recovering and the swamp didn't change in its scale or state. Obviously beaver were present and held the dams intact.

In the early 80ies, the northern forest was logged again, only at the edges of the wetland, trees were left. The southern forest also shows gaps of logging activities. The water of the beaver pond was gone and the site was drained for agriculture.

Until the year 1998 the beaver didn't come back and the swamp was not flooded. Higher plants like shrubs succeeded in the middle of the swamp area and the surroundings were recovered by young forests. In 2000 large parts of the swamp were covered by pond-lily and skunk cabbage. Beavers came back and rebuilt the dams so that the swamp was flooded again and several trees died of permanent high water level. Currently the beaver swamp is in a recovering state and the activities of the beavers are highly present.

### **8.2 Soils**

Well-drained Saturna soil is the most dominant soil type of the property. It covers the wooded areas, north and south of the wetland. Moderately well-drained Trincomali soils occur within the property in a small area south of the wetlands east end.

According to the Canadian Forest Service (S.Eis & D.Craigdallie 1980), the wooded land has good forest productivity and it is suitable for any kind of use or development.

The majority of the wetland area in the bottom land is covered by Metchosin soil, which is a very poorly drained Organic soil that has developed on deep (>160 cm) deposits of black, humic, well-decomposed peat materials,



composed mainly of sedge and woody plant remains. The soil is stone-free. A short part of the wetland, south-east of the property is covered by poorly drained Tolmie soils. A small area of the property at the western end of the wetland is covered by imperfectly drained Brigantine soils.

The Canadian forest Service gives the wetland area a moderate agricultural potential but it is marginally suitable for development.

### **8.3 Climate**

Due to the rain shadow effect of the surrounding Olympic and Coastal mountains, the southern Gulf Island's Climate is described as "West coast summer dry". Therefore, summers are dry and warm, and winters cool, mild and wet. 75% of the annual precipitation occurs between October and March, with a total of approximately 920 mm rain in a year. There is an annual sunshine of 2000 hours at sea level.

The average Temperatures in January are between 3.5°C and 7°C. Freezing happens only occasionally, around -3.5°C in average. In July, temperatures range from 17 to 22°C.

### **8.4 Hydrology**

The area of the wetland is an important groundwater discharge zone, the wooded slopes around are within recharge zones.

The water level depends on rain, sources, runoffs and seepage from surrounding sloped forests and finally on the activities of beavers.

It has an outflow at the western side forming the Beaver creek which runs through the Pebble Beach Reserve into Cable Bay. Most of the time this creek has only little flowing water but becomes important after enduring rainfalls in winter seasons when the water level rises over the capacity of the beaver dam.

There have been carried out measurements in a transect line, testing on bathymetry, pH, temperature and dissolved oxygen of the stagnant open water body. Its results show a very little amount of dissolved oxygen (0.48 mg/l to 0.66 mg/l) which doesn't support fish. Closer to the shore, near the

water surface, DO is higher (1.7 mg/l) and it supports life of insect larvae, bugs and vegetation like duckweed. The temperature of the water is relatively warm and has only little differences between surface and bottom of the pond. The acidity of the water is close to neutral with a pH of 6 to 7. This supports a high nutritional content, which however hasn't been measured.

The wetland ground seems not very deep and there is no deep middle point. It has on a long distance a similar depth before it goes up to the shore. The ground is probably not flat but has several pieces of old snags and logs as well as root systems of hardhack bushes on its ground. This indicates the original wetland type of a treed swamp in a flat depression which is now flooded, caused by beavers restoring the dams.

The current wetland form is mostly non-vegetated, partly aquatic shallow water, less than 2 meters deep. At its shoreline it has a seasonal lacustrine marsh with graminoid plants as sedge, rush and grasses. A seasonal marsh has a dynamic vegetation community and can change in composition over a short time. Due to the low water level during summer months the shoreline drew down and left a marginal mudflat which was colonized by pioneer plants like forget-me-not, duckweed and grasses.

The riparian zone is an important habitat for wildlife and it provides primary food sources as well as sites for nesting, breeding and cover for a variety of species.

## **8.5 Flora**

The diverse vegetation within the property is typical for the local area.

A detailed mapping of vegetation communities has been done for the baseline report.

There are three different natural ecosystem types within the property, which are young forest, Riparian and Wetland. The majority is wooded land with coniferous or broadleaf dominated plant communities.

### **8.5.1 Forest**

Most of the coniferous young forests have Western Red Cedar and Douglas-fir as dominant species in the main tree canopy. The understory is highly dominated by salal, followed by sword fern. This fits into the typical vegetation community of the Coastal Douglas-fir bioclimatic zone which is, within British Columbia, described as an “ecosystem at risk”.

Due to moisture and slope position, vegetation communities differ slightly. A natural regeneration of coniferous trees, mainly Douglas-fir and Red cedar, occurs in most of the forested areas but in different densities.

Besides the coniferous forest, there are parts with red alder as dominant species of the tree layer. Red Alder dominated young forests occur in depressions and in light sites where coniferous trees have been logged, as well as close to the riparian area of the pond. In several red alder dominated forest parts , Douglas-fir and western red cedars are in a tall shrub growing stage and will sooner or later develop the alder site back to a coniferous young forest.

Red alder also covered most of the large depression which is called the Great Beaver Swamp, while the area was drained. Now, those trees are flooded and dead alder snags, as well as several red cedar snags, still remain in the water. Those snags will fall sooner or later of wind-throws and will be decomposed to a peat layer on the pond ground.

In several places invasive species settled within the property:

English holly (*ilex aquifolium*) has been found in three spots. One larger population grows close to the pond but outside of the property border. Another huge bush of holly grows near the riparian zone south, and a smaller spot north of the wetland. To prevent an extension of this invasive plant it should be removed. Its locations are marked in map I

Plants of the locally much spread invasive species Scotch broom (*Cytisus scoparius*) were found only in two places in a not yet large extension, in the coniferous forest north of the water as well as along Melissa Road. A removal is still possible and recommended.

Evergreen blackberry (*rubus laciniatus*) occurs only in a small scattered form, mostly in some parts of the riparian zone. It is not considered as that much damaging to native plants that a removal is necessary.

### **8.5.2 Riparian**

Surrounding the pond in a relatively thin line (0.5 – 3 m wide) the riparian vegetation zone is characterized as lacustrine marsh and colonized by wetland species. The most extensive parts of those species are the north- and south-west shores of the pond, where Slough sedge (*Carex obnupta*) is the dominant species and spreads partly up to 5 meters into red alder and Salal communities. Further north it changes to dense Common rush (*Juncus effusus*). The most dominant species around the shoreline is Creeping Bentgrass (*Agrostis stolonifera*), but sedges and rushes occur in patches all along the shore including the beaver dams across the water.

### **8.5.3 Shallow water Wetland**

The shallow open water has only a few aquatic plant species like Floating-leaved pondweed (*Potamogeton natans*) and Common duckweed. However, large parts of the water are covered by coarse woody debris of alder and red cedar. Some of those trees are fallen and their root-plates emerge out of the water and provide a habitat for several different wetland and upland plant species (for a list of those, see baseline report). In the middle part of the pond hardhack covers the water in dense patches. It is possible that these plants won't survive in a long term, if the water table still rises.

The pond-lily field in the east part could however extend during the next vegetation periods especially when "coarse woody debris" (CWD) of flooded trees vanish to decomposition.

## **8.6 Fauna**

The most obvious and significant fauna in this area is the beaver. However it is not known how many individuals are currently living at the beaver pond. There is one lodge located in the middle part of the large pond, close to the southern shore. Beaver activities as dragging paths and logged trees are abundant and found at all areas around the swamp. The beaver is the main species to be protected at this site, due to its value of creating an ecosystem, significant for many other species. Flooded dead trees provide living habitats for insects and therefore feeding and breeding spots for birds. This ecosystem with much CWD is an excellent habitat for all five species of the local woodpeckers. Perching birds like the Belted Kingfisher find good conditions, as well as waterfowl like Mallards as wintering guests. The Great blue Heron as a blue listed species has been observed frequently. The vegetation of the riparian zone provides important habitats for insects like Dragonflies and amphibians like the Pacific tree frog and the blue listed Red-legged frog. The forests are habitats of mammals as black-tailed deer, the Red squirrel and raccoons.

The current wetland form is created by the work of beavers. There are still a lot of red alder trees, as food material for beavers, available. It is expected that the beaver and so the wetland as a shallow water pond, will remain at least for the next ten years. However due to the natural cycle of such an ecosystem, one day the beaver will abandon the site and it will develop again to a swamp or a fen wetland.

## **9. Ecological Management**

The principal goal is to protect and preserve the existing ecosystems in a natural state and to allow for natural succession of the ecosystems. To preserve the local diversity of vegetation communities and to prevent further spreading of invasive species, it is recommended to remove English holly and

Scotch broom from the property. Its locations are marked in map I. Other native plant communities shall be left undisturbed.

To protect wildlife habitats, visitors shall use only marked trails and leave no garbage in the area.

To achieve the principal goal the following aspects shall be respected:

- No removal or damaging of native plant communities
- No damaging of the shoreline
- No open fire
- No hunting
- No unauthorized boating
- No public access to the beaver lodge area

Ecological monitoring

To document the changing process of the Great Beaver Swamp and consistent monitoring of native plants, wildlife and physical conditions of the water body should be done and could be carried out through school classes in educational programs, volunteer interns or Conservancy staff.

## **10. Human use inventory**

### **10.1 History of ownership and land use**

In William Ralph's land survey in 1888 the beaver swamp was first mentioned and showed in a map. After several people claimed and abandoned the land, Edward McCoskrie got his pre-emption certificate (no.1246) for the District Lot 61 on October 17<sup>th</sup> 1894, and settled with his family soon after. He purchased the 160 acres site in May 1922 for 160\$ from the Province of B.C. In June 1922 it became crown granted. After Edward McCoskrie died in 1925, the Lot 61 was probably owned by his son William McCoskrie who worked all his life on the Lot and passed it on to the

husband of his sister Melissa, Darwin Horatio Robertson, on the 15<sup>th</sup> of October 1952. Sixteen years later, on June 19<sup>th</sup> 1968, Darwin Robertson passed the land to three quarters on to his children Agnes Marjorie Lambe, Violet Robertson and Dorothy Robertson. On October 17<sup>th</sup> 1980, the owning members of the Robertson family sold District Lot 61 to N. TWA Equipment Ltd., Ganges and J. Langdon Logging Ltd., Victoria. After logging large parts of the forests, Remnant District Lot 61 was sold and subdivided into 13 private lots in 1982.

Before Galiano Conservancy Association purchased the property lot 7 of District Lot 61, in June 2003, the last owners were Ronald Pither and Martin Frost who used it partly as a mating yard for bees.

In the late 1990ies two old trailers, a truck and large amounts of trash and debris were located on the property. 2004 The Galiano Conservancy removed all of these items from the site. Currently there are a few minor items left near the remains of a burn pile at the disturbed site. The burn pile area is still visible. A final cleanup is recommended.

## **10.2 Value to the community**

### **10.2.1 Visitor use**

A current value to the community is present through recreational possibilities. There are several trails through the forest (further described in access). At a grassy clearing in the forest; two wood tables for picnic purposes are available.

### **10.2.3 Education**

In recent years, several educational programs for school classes took place at the Great Beaver Swamp. School kids investigated the wetland for bugs and insect larvae and watched a puppet show for environmental education purpose at the huge unique tree association in the forest.

### **10.2.4 Access**

There is a parking lot at the Cable Bay trail-head. From there a gravel road leads to and along the north property border of lot 7. However, a physical barrier blocks the beginning and only local residents are allowed and able to pass it by car. There is no possibility to access to the wetland by car.

From the northern gravel road, two trails lead into the forest. They meet at a grassy clearing with picnic tables and a huge tree association. From there a former logging road heads towards the wetland. Another small trail leads to the shore where currently a canoe is located. The old road bed of the former logging road is flooded, on the other side it continues through the forest along the wetland in west direction. A huge old cedar log blocks the trail, however there is a small path leading around the log. At the west end of this southern trail, a small trail heads up to Melissa road. Its beginning is however not obvious. The old logging road heads on to the neighbor's property. South and north forests are not connected by trails. The edge of the pond is accessible at two spots at the north shore, and in one place at the south shore.

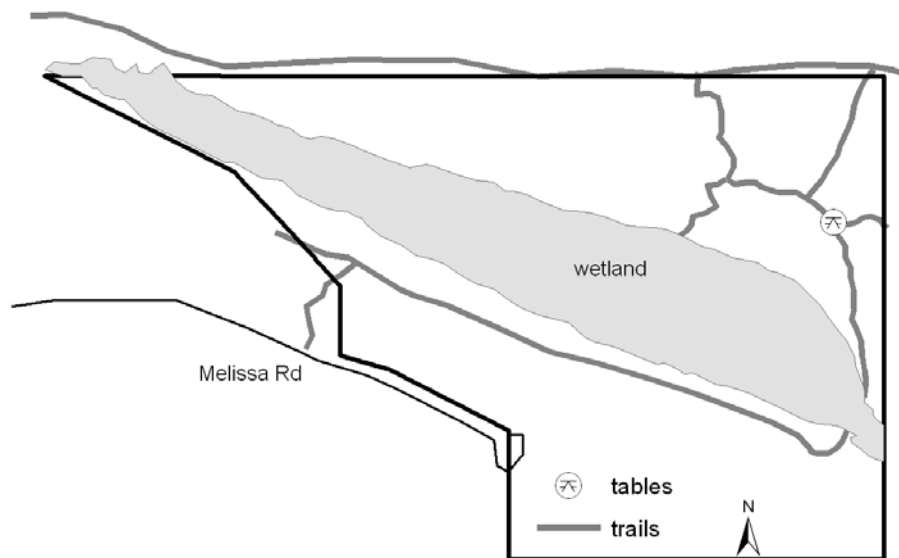


Figure 3: current trails on lot 7



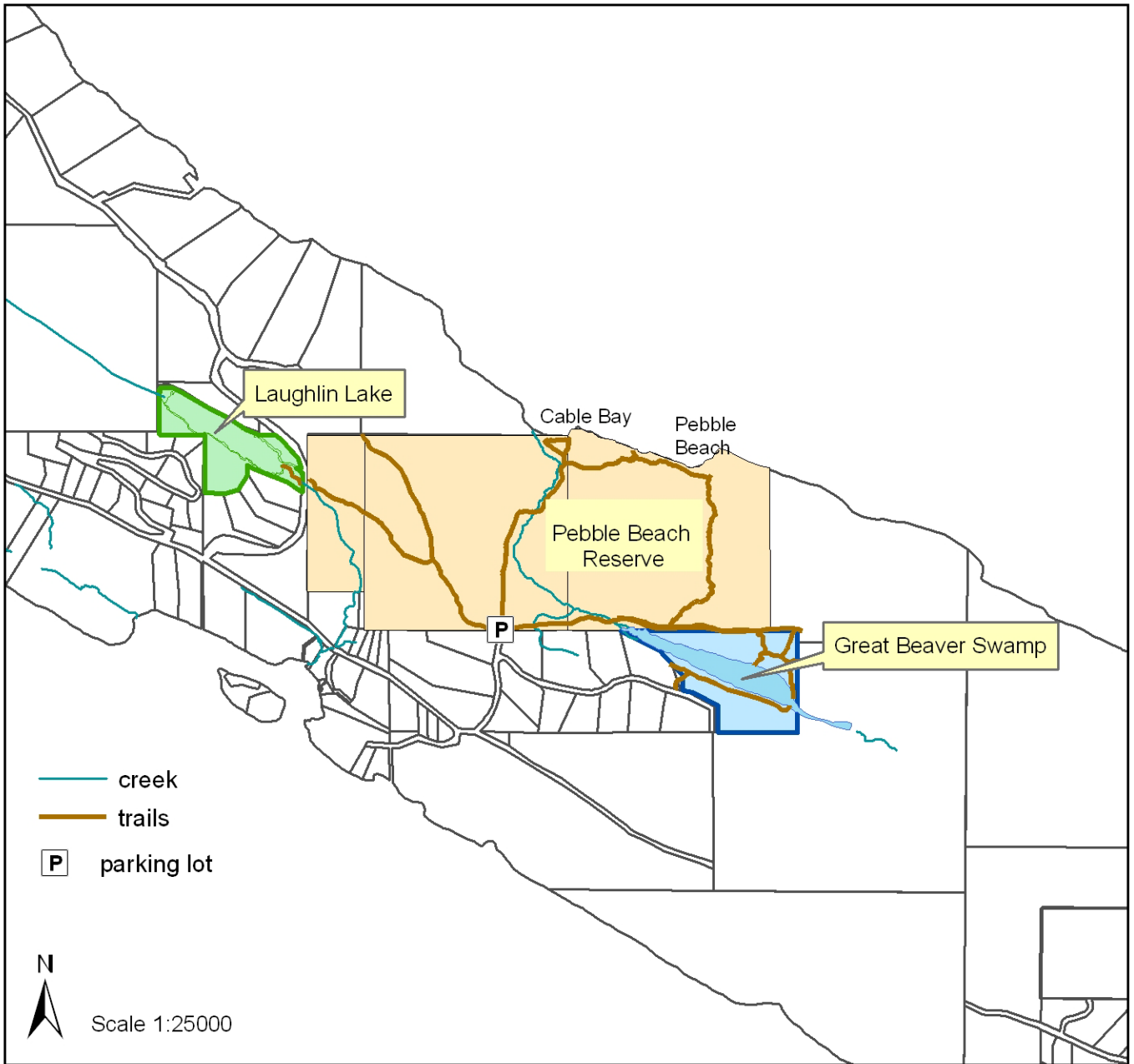


Figure 2 : current public trail-network through protected areas, connecting Laughlin Lake, Pebble Beach Reserve and Great Beaver Swamp

## **11. Education, public use, access Management:**

Groups of School kids can damage the shoreline while participating in educational programs. Trails are currently not obvious enough for visitors and there is no convenient possibility to cross the wetland.

The following questions were raised and discussed with interested members of the Galiano community at a meeting onsite as well as at an open house at the Conservancy office in January 07:

- Should there be a possibility to cross the wetland and connect the trails north and south the wetland?
- Should the Great Beaver Swamp and its trails be made more accessible / obvious to the public? – From both sides of the property?

As an option to make it possible to cross the wetland, a boardwalk, connecting the trails north and south of the wetland, could be installed at the flooded old road bed at the east end of the property. Through this, the area of the Great Beaver Swamp would be connected to the trail-network of Pebble Beach Reserve and Laughlin Lake. Visitors might be able to start their hike at the end of Mellissa Road, passing the wetland and continue to the Pebble Beach trail or further to other trails.

But concerns of the public and local residents, that a starting point for hikers at the end of Melissa Road would bring a change and a significant impact to the neighborhood of Melissa Road, because visitors would park their cars at the end of Melissa Road which brings a lot more traffic to the no-through road especially in summer times, lead to the conclusion that it is finally not necessary to provide such a crossing facility.

A more frequent use of the trail along the wetland in the south part might lead to garbage problems and could disturb wildlife as the beaver lodge is

located nearby. The Conservancy will not build a boardwalk across the wetland and so public use is restricted to the north part of the Great Beaver Swamp property.

### **Trail management:**

In order to make the part north of the wetland better accessible and enjoyable for visitors without disturbing its ecosystems, the general goal is to improve and define the existing trails. The building of new trails, especially along the sensitive shoreline of the wetland, should be avoided. The following objectives are set to fulfill this goal.

#### 1. obvious trail from northern gravel road

For the advantage of visitors and local neighbors the trail, heading to the picnic area and the wetland from the north gravel road, should be made more obvious, especially its beginning.

#### 2. Interpretative signage

This might inform visitors about the sensitivity of a wetland and its ecosystem and give certain awareness to use facilities on one's own risk. Other signage aspects could be: No open fire, no boating, no hunting etc. Possible locations of a signage could be at the trail-head at the northern gravel road, at the clearing with tables and/or at the floating dock.

#### 3. trail down from Melissa Road

The existing small trail down from Melissa Road will, after the boundary adjustment, be in large part on the property of lot 6. To keep a possible access down to the old logging trail, a small non-public trail shall be provided for the use of local residents and future interns or staff, working on the site.

## **Building management:**

### Floating dock as an observation platform in the water

Such a platform on the open water is an interesting feature for everyone to experience the wetland. It is especially useful for environmental education programs with groups of young kids to experience the life in and on the water without damaging the sensitive shoreline. Building materials shall be taken from the site, as far as possible. Its location shall be close to the shore, accessible by a short boardwalk from the 'canoe-trail' at the north shore of the wetland (see map I). For safety issues it shall have a railing and it shall be low enough so that the kids are able to reach to the water.

### A cottage as accommodation for volunteer interns

The Conservancy Association welcomes national and international students to volunteer for a period of time in projects of the Conservancy throughout the year. To provide its own accommodation facility for those interns, the Conservancy is planning to build a small simple cottage on the Great Beaver Swamp property. Its location shall be somewhere at the end of Melissa Road. It shall be an ecological building using natural resources and its building material shall be taken from the building site or property lot 7 as far as possible. A simple lab could be integrated in the cottage, to improve monitoring actions at the Great Beaver Swamp or other protected areas nearby.

## 12. Regulatory inventory

The property has a current Land Use designation in the Galiano Island Official Community Plan of "Rural". This area is intended to allow for larger lot developments to provide opportunities for a variety of rural activities without impinging on neighbors.

Rural policies are:

- a) The principal use shall be residential.
- b) One dwelling unit shall be permitted per lot and one additional dwelling shall be permitted for every 4 hectares of lot area over 4 hectares.
- c) On lots 0.4 ha or more, one cottage shall be permitted per dwelling unit permitted.
- d) The average lot size for subdivision of rural land shall be at least 4 ha.
- e) Within this designation a number of different zones may be applied allowing differing levels of uses accessory to residential uses.

The property has a current zoning designation of "Rural 2 Zone (R2)" under Galiano Land Use Bylaw No. 127.

Under Galiano Land Use Bylaw No. 127, Section 5.5, the following uses are permitted, all other uses are prohibited.

### Permitted Uses

- 1. dwellings
- 2. cottages

3. home occupations
4. farm use

#### Permitted Density

1. One dwelling is permitted on each lot, and one additional dwelling is permitted in respect of each 4 hectares of lot area over 4 ha, except that:

On land, legally described as Lot 7 District Lot 61 Galiano Island Cowichan District Plan 37526 only one dwelling and one cottage are permitted.

### **13. Legal management**

- covenant on wetland / northern forest
- boundary adjustment (figure 4)
- protection of last missing part of the Great Beaver Swamp wetland

Due to the current land-Use designation, a cottage is permitted and possible. One goal of the Conservancy is, to build a cottage on the south part of the property, close to Melissa Road. The current By-law and zoning allows a dwelling and a cottage anywhere on this property. But because it is an important issue to prevent the wetland and riparian area from any development, it is planned to put a covenant on part of the property, including the wetland and the northern forest. Through this, the wetland is protected and the Conservancy is still allowed to build a cottage for interns in the southern part. Details about the Covenant contents are not yet set up.

The boundary adjustment with property lot 6 is set by mutual agreement and will be officially completed as soon as possible. (For details see baseline report or figure 4)

In order of protecting the whole Great Beaver Swamp wetland it is aspired to add the last missing part of the wetland, southeast of property lot 7, to the ownership of the Galiano Conservancy.

## **14. Implementations**

### **Short term (within 6 months)**

- obvious trailhead from northern gravel road
- trail south from Melissa Road
- Remove of invasive species
- Final cleanup at trailer site
- Complete boundary adjustment

### **Mid term (within one year)**

- Interpretative signage for visitors
- floating dock as an observation platform in the water

### **Long term**

- A cottage for volunteer interns, at end of Melissa Road
- Covenant on wetland and northern forest
- Purchase and protection of last missing part of Great Beaver Swamp southeast of lot 7.

### **Ongoing and monitoring actions**

- Monitor changing process of the Great Beaver Swamp
- Environmental education programs

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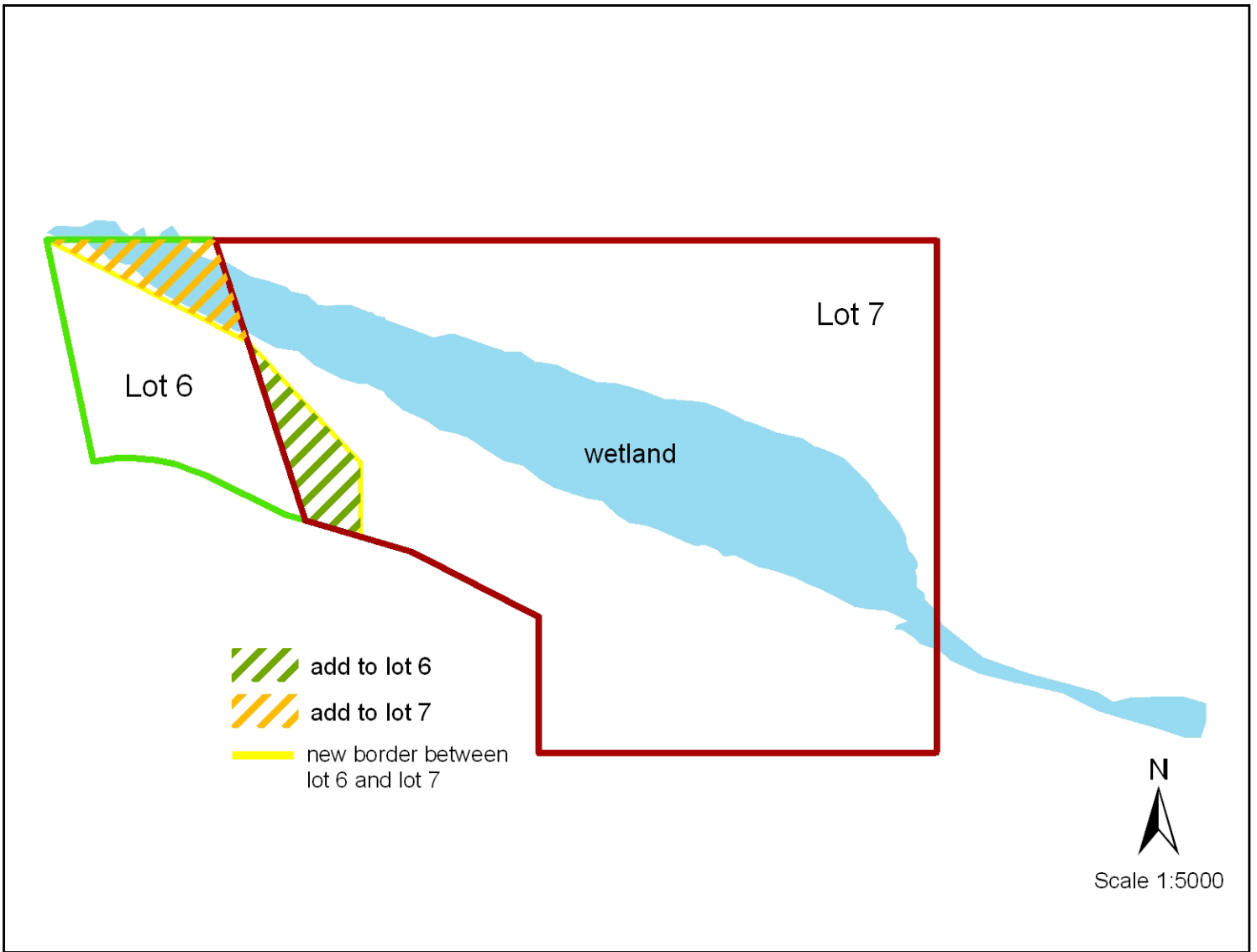


Figure 4: boundary adjustment between district lot 6 and district lot 7

# Management Plan map I

🚧 implementations

- 1 obvious trailhead with signs and arrows
- 2 non-public trail down from Melissa Rd
- 3 Removal of invasive species (holly and broom)
- 4 clean-up of former trailer site
- 5 floating dock as observation platform
- 6 cottage for volunteer interns
- 7 purchase and protection of wetland

⊗ clearing with tables

🌿 Scotch broom

🌼 english holly

— trails

▭ property border

Scale: 1:2500

0 25 50 100 150 200 Meters

Galiano Conservancy Association  
Sabine Luning  
Map I / Jan 07

