

# Laughlin Lake Management Plan

Prepared for the Galiano Conservancy Association  
by Steven Gates\*, 2002 (Updated May 2003)



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THE REAL ESTATE  
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## **1.0 Introduction**

### **1.1 Galiano Conservancy Association Purpose**

The Galiano Conservancy Association is a community based land trust. Formed in 1989, it is one of the first such organizations in British Columbia. As a land trust, the Conservancy seeks to promote sustainable use of the natural environment. The Conservancy does this through a combination of educational and land protection activities.

The Constitution of the Galiano Conservancy Association states the following purposes:

- 1) To preserve, protect and enhance the quality of the human and natural environment of the area;
- 2) To conduct research programs with local citizens and qualified persons on important issues in the fields of development and conservation;
- 3) To facilitate public education and participation in resource and land use management, including ecologically sound forestry practices;
- 4) To facilitate forestry practices that are directed towards the preservation, protection and enhancement of the human and natural environment;
- 5) To promote models of compatibility between land use and land characteristics, giving full and serious consideration to the biologic and aesthetic values of the land;
- 6) To promote the establishment of wilderness and other natural habitat preserves for the benefit of this and future generations;
- 7) To raise money, acquire funds and other assistance, and to own, acquire, and take by purchase, donation, devise or otherwise, land or personal property; and expend, sell exchange, lease, let, improve or develop same for the purposes of the society;
- 8) To do everything incidental and necessary to promote and attain the foregoing purposes and periodically to reassess these purposes.

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## 1.2 Plan Purpose

The purpose of this plan is to articulate the proper management of the property known as Remnant Parcel 'D' of District Lot [D.L.] 66, otherwise referred to in this plan as Remnant 'D' of D.L. 66 or as the Laughlin Lake property. This plan includes a comprehensive description of the following biophysical and legal attributes:

- Legal description;
- Historical land use;
- Geology and soils;
- Climate;
- Limnology and Hydrology;
- Flora; and
- Fauna.

The purpose of this description is to make sound decisions for the short, medium, and long term management of this property especially regarding issues such as protection, access, recreation, ecological monitoring, and ecological restoration.

## 1.3 Planning Process

Information for this management plan was gathered from three sources. First, existing literature and data were collated and reviewed. Secondly, a number of field investigations were performed to fill information gaps. The final source of information for this management plan was input from the general public. Public input was collected during two open houses, both of which were held at the Galiano Conservancy Association office.

The first open house, held on August 31<sup>st</sup>, 2002, presented general information on the Laughlin Lake property and sought to collect general feedback on its management. This open house collected the verbal and written input from approximately 20 members of the community.

The second open house, held on September 14<sup>th</sup>, 2002, sought to collect specific information by allowing people to comment on the first written draft of the management plan. The second open house collected written and verbal input from approximately 15 members of the community. It should be noted that the public input collection was a

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voluntary move on the part of the Galiano Conservancy Association, as a means of encouraging community involvement in the land management process.

The written product of this process will be considered a 'draft' until it's approval by the Galiano Conservancy Association membership at its Annual General Meeting in the spring of 2003.

#### **1.4 General Description**

The Laughlin Lake property covers an area of approximately 27 acres, including the 11-acre lake, and is currently zoned as residential land. The lake itself is quite shallow (less than 2m) and, at present, does not support fish. However, it does support a variety of wildlife species. A diverse array of mammals, birds, reptiles, amphibians, and insects have all made their home among the highly variable vegetation communities in and around the lake. The Laughlin Lake property forms an important corridor for wildlife between the Pebble Beach Reserve and Bodega Ridge.

As freshwater habitat makes up only 1% of the Gulf Island's land base, and Laughlin Lake is Galiano Island's largest lake, it is considered to be a very important property and one that is worthy of protection.

#### **1.5 Value to the Community**

Historically, the Laughlin Lake property has been used by members of the Galiano Island community for a number of purposes. In the late 1800's, Laughlin Lake was drained and converted to an agricultural field. This changed in the mid 1900's as the field began to flood due to beaver activity. The property then supported a small gravel pit operation in the late 1970's and early to mid 1980's.

The present uses of Laughlin Lake include educational, scientific and restoration activities organized by the Galiano Conservancy Association and activities such as bird watching and interpretative walks organized by other individuals and organizations. As is the case with many wetland habitats, Laughlin Lake may be responsible for a number of ecosystem processes (i.e. water purification), that are not widely recognized, yet provide value to the community nonetheless.

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## 1.6 Location

Laughlin Lake is located in approximately the middle of the island. It is accessible from Vineyard Way, which branches from Porlier Pass Drive approximately 16km west of the ferry terminal (see Figure 1). The UTM co-ordinates of the lake are Easting 463,000; Northing 5,422,000<sup>1</sup>.

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<sup>1</sup> Map coordinates derive from Universal Transverse Mercator projection UTM(NAD83) ZONE 10.



**Figure 1:**

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## 1.7 Legal Description

### *Land Use Designation*

The property known as Remnant Parcel 'D' of District Lot 66 is currently zoned as Residential and more specifically, Rural 2 (R2). The following description of what is meant by this land use designation includes excerpts from the Galiano Island Community Plan (see Appendix IV-i for selected text from the Galiano Island Official Community Plan #108-1995).

The Objectives for the general 'Residential' land use category are:

- 1) to maintain the rural character, environmental integrity and social diversity of the Galiano Island Trust Area, and*
- 2) to encourage non-profit housing for seniors and low income residents.*

Relevant Residential Policies include:

- c) Only single dwelling units shall be permitted.*
- p) A conservation zone may be assigned to land covenanted or deeded against further development or use, including common property in strata title subdivisions.*

The more specialized term 'rural' is described in Subsection 1.5 with the following text (see Appendix IV-i):

#### *1.5 Rural*

*This area is intended to allow for larger lot developments to provide opportunities for a variety of rural activities without impinging on neighbours.*

#### *Rural Policies*

- 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 (9.88 acres) of lot area over 4 hectares (9.88 acres).*
- c) On lots 0.4 hectares (1 acre) or more, one cottage shall be permitted per dwelling unit permitted.*

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- d) *The average lot size for subdivision of Rural land shall be at least 4 hectares (9.88 acres).*
  - e) *Within this designation a number of different zones may be applied allowing differing levels of uses accessory to residential uses.*

Land Use Bylaw 127 is even more specific in its descriptions of land use. Under this bylaw, Remnant 'D' of D.L. 66 is classified as Rural 2 (R2), for which the following description is given (see Appendix IV-ii):

*Permitted Uses*

*5.5.1 In the Rural 2 (R2) zone the following uses are permitted, subject to the regulations set out in this section and the general regulations set out in Parts 2 and 3, and all other uses are prohibited.*

*5.5.1.1 dwelling*

*5.5.1.2 cottages*

*5.5.1.3 home occupations*

*5.5.1.4 farm use*

This legal description reflects the past and present uses of much of District Lot 66. However, as will be discussed later, this zoning may not adequately reflect the purpose of this management plan.

***Titles, Covenants, and Easements***

Laughlin Lake is, at present, owned by the Galiano Conservancy Association (see Table 1 for list of documents and see Appendix I-i to I-viii for documents). This ownership excludes Undersurface rights, which are currently held by the crown. Also excluded is Easement EK56114 (appurtenant to Lot 15 of D.L. 66), which dedicates 0.385ha of Remnant D for trail purposes. A number of covenants and easements are relevant to the legal description of this property and are discussed below.

**Table 1:** Legal attributes and associated descriptions for Remnant ‘D’, DL 66.

<b><i>Legal Attribute</i></b>	<b><i>Description</i></b>
<b>Registered owner in fee simple: Description of Land (see Appendix I-i):</b>	Galiano Conservancy Association, In. No. S25093 Title #: EP74531 Parcel identifier:003-573-583 Remnant Parcel ‘D’ (DD 82109I) of Lot 66, Galiano Island Cowichan District, Except that part in plans 13999, VIP61030 and VIP62118.
<b>Undersurface rights 72763G:</b>	Registered holder of charge: Holden Leroy Beall et al 72763G Remarks: forfeited to Crown as to U 72763G Inter Alia
<b>Covenant EJ107461 (see Appendix I-ii):</b>	Registered holder of charge: The Crown in Right of British Columbia Remarks: Inter Alia, Land Title Act, Section 215
<b>Covenant EJ1077463 (see Appendix I-iii):</b>	Registered holder of charge: The Crown in Right of British Columbia Remarks: Inter Alia, Land Title Act, Section 215
<b>Covenant EJ107465 (see Appendix I-iv):</b>	Registered holder of charge: The Crown in Right of British Columbia Remarks: Inter Alia, Land Title Act, Section 215
<b>Covenant EJ107471 (see Appendix I-v):</b>	Registered holder of charge: Galiano Island Local Trust Committee Remarks: Inter Alia, Land Title Act, Section 215
<b>Easement EK56114 (see Appendix I-vi):</b>	Remarks: Part in Plan VIP63403, Appurtenant to Lot 15, Plan 23765

The first Covenant, # EJ107461, is held by the Province and stipulates that no building shall be erected without supervision of a professional engineer. The second and third covenants (Covenants # EJ107463 and #EJ107465) both prescribe a protected area surrounding the lake. These covenants state the following:

*a. Hereafter, no building shall be constructed, or mobile home located within fifteen (15.0) metres of the natural boundary of any nearby watercourse or pond.*

Covenant #EJ107463 adds,

*...without the prior written permission of the Regional Manager of Ministry of Environment, Lands and Parks, Fish and Wildlife.*

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Additional protection is provided by Covenant #EJ107471 (see Appendix I-v), which is held on the property by the Galiano Island Local Trust Committee. It states:

*There shall be no damaging, cutting, felling, or removal of evergreen trees within thirty (30) metres of the natural boundary of Laughlin Lake WITH THE EXCEPTION that nothing herein contained shall restrict or prohibit the cutting, falling, or removal of evergreen trees to the minimum extent necessary, for the purposes of constructing, installing, and maintaining wells, waterlines, and driveways and for the purposes of constructing, installing, and maintaining pipes and poles for the purposes of transmission and distribution of electric energy, communication, and television.*

This 30m setback extends through lots 5 and 6 of District Lot 66 through Covenant #EJ107469 (see Appendix I-vii). This significantly extends the protected area surrounding the lake, except where the property borders Lot 15 (see Figure 2).

The only Easement that Remnant 'D' of D.L. 66 holds on another property is #EJ107477 (see Appendix I-viii), which applies to Lots 4 and 5 for the purpose of accessing two wells, one on each property. Each well access includes an area of 78.5m<sup>2</sup>.

**Figure 2:**

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## **Section 2.0 Goals and Objectives**

### **2.1 Management Goal**

The goal of this management plan is primarily to protect the sensitive ecosystem components that exist within the Laughlin Lake property. Secondly, this management plan seeks to encourage the ecological recovery of areas that have been damaged. Lastly, this plan seeks to provide for the interaction of the community with this unique ecosystem in a manner that is not ecologically damaging.

### **2.2 Objectives**

The management objectives that will be adhered to are as follows:

- (i) **Protection:** The primary ‘use’ of Laughlin Lake is that of protection. All other uses must be compatible with the protection of this sensitive ecosystem.
  
- (ii) **Restoration:** Restoration work to be carried out should seek to enhance the ecological integrity of the property as judged by the Galiano Conservancy Association.
  
- (iii) **Education:** Educational programs should be encouraged to utilise the incredible ‘outdoor classroom’ that is available at Laughlin Lake. Where possible, educational programs should seek to include other management objectives such as Protection, Ecological Monitoring, and Ecological Restoration.
  
- (iv) **Ecological Monitoring:** Ecological monitoring shall take place for the purpose of measuring changes over time in relevant parameters. This monitoring shall be designed by members of the Galiano Conservancy Association and carried out by staff and volunteers from the community, and where possible, incorporated into educational programs with youth.
  
- (v) **Access:** Pedestrian access shall be provided to the short trail leading to the peninsula for the general public and educational groups with permission from and/or supervision by members of the Galiano Conservancy Association.

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## **Section 3.0 History**

### **3.1 First Nations**

There is little archeological evidence suggesting First Nations peoples used the Laughlin Lake property, however there is evidence of First Nations use at a number of sites nearby. Three sites have been identified to the south, in Retreat Cove, and a number of sites have been identified to the north, in the Pebble Beach reserve (Jacqueline Booth and Associates [JB&A], 1995; Erickson, 1998). Many of these sites are referred to as Shell Middens, which are the most common of the archeological features found along the coast and are characterized by deposits of fire cracked rocks, shells, ashes, bone, and dark organic soil (Cassidy, Cranny, and Murton, 1974). Although there have been no sites found at Laughlin Lake, Cassidy et al. (1974) describe typical inland sites as being strongly associated with water sources, be they marshes, lakes, streams, etc. Given that Laughlin Lake is the largest lake on the island and according to the pre-emption claim (see Appendix II-i), it was a water body before it was used as a field, it appears likely that Laughlin Lake was used by First Nations Peoples at one time.

### **3.2 Land Use and Ownership**

The Laughlin Lake property has had an extremely varied past (see Table 2). In Walter Beall's 1873 pre-emption claim, a lake is shown within a 160-acre parcel of land. At the time of the 1888 Crown grant and official survey of the property, the lake had apparently been drained and was in use as an agricultural field. As described in the original survey notes, "Survey of 20 acres for Walter Beall adjoining his pre-emption claim so as to include a cultivated field (excerpt from William Ralph's 1888 survey notes<sup>2</sup>)".

The first subdivision of the property occurred around 1909 when Francis Smith Wiggs bought the 100 acres that contained Laughlin Lake. The letter 'D' was not assigned to this parcel until 1930. The property was again subdivided in 1995 leaving the 27 acre parcel referred to as Remnant 'D' along with 6 other lots. Figure 2 displays the current shape of Remnant 'D' and its neighboring lots.

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<sup>2</sup> William Ralph's 1888 survey notes are on file in the Galiano Conservancy Association library.



**Table 2:** Land Use History of Laughlin Lake<sup>3</sup>.

<i>Date</i>	<i>Description</i>
<b>1873</b>	Sept. 16- Pre-emption Claim made by Walter Weatherby Beall for 160 acres (see Appendix II-i).
<b>1888</b>	Dec. 3- Crown Grant to Walter Weatherby Beall for 180 acres (see Appendix II-ii).
<b>1909</b>	July 3- Deed is transferred to Francis Smith Wiggs. First subdivision occurred.
<b>1930</b>	Sept. 22- Deed is transferred to The Royal Trust Company. First time Letter 'D' is assigned to property.
<b>1933</b>	April 25- Deed transferred to Annie Strickland. Nov. 10- Deed transferred to Esther Eugenie Portway.
<b>1936</b>	Nov. 25- Deed transferred to Richard Henry Beare and Eliza Jane Beare. Nov. 25- Deed transferred to Alexander Page Nov. 25- Deed transferred to Gladys Marie Newstead.
<b>1945</b>	Dec. 28- Deed transferred to Jean Johnson.
<b>1953</b>	Sept. 11- Deed transferred to Shirley Stewart.
<b>1972</b>	Fred Stevens and Dave Laughlin began operating a gravel pit beside the lake.
<b>1974</b>	June 26- Hugh James Lionel Laughlin, retired businessman from Don Mills, Ontario officially included Hugh David Laughlin in the deed.
<b>1986</b>	Gravel pit closed.
<b>1994</b>	Vineyard Way constructed; Laughlin Lake extended to old gravel pit.
<b>1995</b>	Sept. 27- Subdivision of remainder of Parcel D creating the current 27 acre Laughlin Lake property.
<b>2000</b>	Sept. 11- Galiano Conservancy Association purchased parcel 'D' with the assistance of an interest free loan from supporters (see Appendix I-i).

### 3.3 Project History

The Galiano Conservancy Association Board of Directors identified Remnant 'D' of D.L. 66 as having potential for conservation in the mid to late 1990's. Shortly thereafter, a developer attempted to purchase Remnant 'D' and the surrounding parcels. The developer was unable to purchase all the lots he required, which created an opportunity for the Galiano Conservancy Association to purchase the land.

<sup>3</sup> Many of the documents listed in Table 2 are on file in the Galiano Conservancy Association library.

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In 2000, the property was purchased with the help of an interest free loan for approximately \$150,000. In order to pay off this loan, the Galiano Conservancy Association has held a number of community fund raising events including ‘Shear Turner’, a lamb barbecue, and a Tea Party auction. Other funding support is being provided by Habitat Acquisition Trust (HAT), the Islands Trust Fund (ITF) and the Georgia Basin Ecosystem Initiative (GBEI)<sup>4</sup>. As part of an informal agreement, the Galiano Conservancy Association will hold the official title on the land while HAT and ITF will share a conservation covenant<sup>5</sup> on the property and the GBEI must approve the management plan.

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<sup>4</sup> The final payment on the loan was made in May 2003.

<sup>5</sup> The HAT/ITF covenant is yet to be developed.

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## **4.0 Ecological Inventory**

### **4.1 Geology and Soils**

According to Muller and Jeletzky (1970), Galiano Island sits atop a formation of sedimentary rock formed approximately 65-100 million years ago (during the Cretaceous Age). Williams and Pillsbury (1958) estimate this formation to be approximately 3050m thick and to consist of conglomerates, sandstones, and shales. According to Agriculture Canada (Green, Van Vliet, and Kenney, 1989), the soil in this area is dominated by Qualicum<sup>6</sup> and Saturna<sup>7</sup> soil types.

### **4.2 Climate**

The climate of Galiano Island is the product of two main factors. The first is the ocean, which serves to moderate temperature fluctuations. As such, average temperature on the island ranges from 4°-5°C in January and February to 17°-19°C during July and August. The second contributing factor is the Rainshadow effect caused by close proximity to the Olympic and Vancouver Island Mountains. Annual average rainfall on the island is approximately 920mm<sup>8</sup> with a range of 597.3mm to 1152.6mm (Harrison, 1994). Winters receive 75% of the annual total with less than 10% falling in the form of snow. The product of these influences on Galiano Island is a climate that is warm and dry in the summer and wet and cool in the winter. As described by Kerr (1951), this area exhibits a, “Transitional, Cool Mediterranean climate”.

### **4.3 Limnology and Hydrology**

Water quality attributes of the lake were assessed over a number of sampling days. Information was gathered on depth (bathymetry), acidity (pH), oxygen content (dissolved oxygen), clarity (secchi depth), temperature, and ion concentration (conductivity). The data collected are as expected for a shallow lake with high

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<sup>6</sup> Qualicum soil: “Gravelly sandy loam to gravelly sand glaciofluvial, fluvial, or marine deposits more than 150 cm deep (Green et al., map, 1989).”

<sup>7</sup> Saturna: “Channery sandy loam and channery loamy sand colluvial and glacial drift materials less than 100cm deep over sandstone bedrock (Green et al., map, 1989).”

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temperatures near the edges and subtle differences in dissolved oxygen and temperature between the bottom and surface of the lake (see Appendix III-i). This information forms a baseline that will compliment a future monitoring program.

Bathymetric data were collated in the form of a map (see Appendix III-ii). According to data collected, the lake is deepest near the south where it reaches a depth of approximately 2m. The lake depth gradually decreases from south to north until it borders on a mudflat to the northwest. This gradient reflects the general flow of water through the Greig Creek watershed (see Figure 3). The inlet and outlet streams are seasonally visible and located at the northwest and southeast ends of the lake respectively.

The lake level appears to depend on three main factors,

1. rainfall and runoff from within the Greig Creek watershed (see Figure 3);
2. groundwater springs; and
3. beaver dam building and maintenance.

Fluctuations in any of these factors could lead to significant changes in the volume and water quality of both Laughlin Lake and Greig Creek. Potential causes of fluctuations could include road building within the watershed, beaver population disruption, and/or excessive precipitation to levels that exceed the capacity of the beaver dams.

The biophysical attributes of Laughlin Lake (i.e. vegetation, hydrology, limnology) are all characteristic of the ‘Shallow Water’ wetland classification and more specifically the ‘Linked Basin Water’ subform as described by the National Wetlands Working Group (1997). As mentioned in Section 4.4, there also exists the ‘Linked Basin Marsh’ subform at the north west end of the property. These subforms differ in the amount of water present and in the vegetation that they support. Shallow water wetlands are permanently flooded and less than 2m, while marsh wetlands are seasonally wet. However, both these wetland types are found in topographic depressions with inlets and outlets.

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<sup>8</sup> As measured between 1977-1988 at the North Galiano Atmospheric Environmental Service station.



Figure 3:

#### 4.4 Flora

The flora found in Remnant 'D' of D.L. 66 is very diverse. This diversity reflects the vast difference in moisture that exists between the aquatic and forested areas. This diversity also reflects the variation in the level of disturbance induced by historical construction activities on the property. As part of the description of the flora of the area, a detailed mapping of vegetation communities was carried out (see Appendix III-iii). A summary of this work is presented in Figure 4.

##### *Forest*

The forest surrounding Laughlin Lake is typical of the Coastal Douglas-fir Biogeoclimatic Zone. As such, the upper canopy is dominated by Douglas-fir (*Pseudotsuga menziesii ssp. Menziesii*), Western redcedar (*Thuja plicata*), and Arbutus (*Arbutus menziesii*). Big leaf maple (*Acer macrophyllum*) and Red alder (*Alnus rubra*) are also present to a lesser degree. Understory species include Salal (*Gaultheria shallon*), Bracken fern (*Pteridium aquilinum*), and Sword fern (*Polystichum munitum*).

Within the forested area surrounding the lake (see Figure 4), a number of species assemblages were observed. For example, the north shore of the lake is characterized by a Douglas-fir and Arbutus dominated upper canopy. This differs from the south side of the lake, which is characterized by Western redcedar and Douglas-fir in the upper canopy. The section of forest at the northwest end of the lake appears to experience seasonal flooding and has Red alder and Western redcedar as the dominant tree species.

Variation within the forested area is also found within the riparian zone on the south side of the lake. This area has a canopy similar to that found throughout the surrounding upland forest, but its understory is almost completely covered with Vanilla-leaf (*Achlys triphylla*). This area appears to be a transitional zone between the lake shore and the forest. It is included in the Riparian zone in Figure 4.

##### *Riparian*

Just below the forest and completely surrounding the lake is the riparian vegetation zone. This zone is dominated by smaller plants such as rushes, sedges, and grasses. Dominant species of the riparian area include Common rush (*Juncus effusus*),

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Small-flowered bulrush (*Scirpus microcarpus*), Reed canary grass (*Phalaris arundinacea*), and Field mint (*Mentha arvensis*). This community is relatively homogenous for much of the lake-shore with intermittent sections of forest extending down to the waters edge. Also included in this zone were emergent<sup>9</sup> species such as Cattail (*Typha latifolia*), Narrow-leaved bur-reed (*Spaganium angustifolium*), Water smartweed (*Polygonum amphibium*) and Common duckweed (*Lemna minor*).

### ***Basin Marsh Wetland***

Near the northwest end of the lake, there is an extension of the riparian community out onto a mudflat. This forms a distinct vegetation community dominated by Slough sedge (*Carex obnupta*), Skunk cabbage (*Lysichiton americanum*), and Reed canary grass (*Phalaris arundinacea*) and is characteristic of the Linked Basin Marsh Wetland Classification as described by the National Wetlands Working Group (1997).

### ***Shallow Water Wetland***

Aquatic plants are very common in Laughlin Lake. Almost the entire lake is full of some kind of hydrophytic<sup>10</sup> vegetation as seen in Figure 4 (The mapping in Appendix II-iii reflects only the most prolific of the aquatic plant communities). Of the mapped communities, the most common aquatic plants are emergent species such as Grass-leaved pondweed (*Potamogeton gramineus*) and Floating-leaved pondweed (*Potamogeton natans*). Submergent<sup>11</sup> vegetation species were also members of the *Potamogeton* genera.

### ***Disturbed Sites***

The area between the lake shore and Vineyard Way is very different from the rest of the property. This area has been subjected to a number of disturbances over the past 30 years, including the operation of a gravel pit during the 1970's and early 1980's. This area was further impacted by gravel removal for the construction of Vineyard Way in

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<sup>9</sup> **Emergent** vegetation have submerged roots with some parts above water.

<sup>10</sup> **Hydrophytic** vegetation are plants that either require or can tolerate wet conditions.

<sup>11</sup> **Submergent** vegetation are entirely submerged.

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1994. This additional disturbance resulted in the flooding of the pit and therefore the creation of the peninsula at the southeast end of the lake (see Figure 4).

Dominant species in this area include Kentucky bluegrass (*Poa pratensis*), Orchard grass (*Dactylis glomerta*), Canada thistle (*Cirsium arvense*), Red alder (*Alnus rubra*), and Scotch broom (*Cytisus scoparius*). On the peninsula there is a sparse upper canopy consisting of Red alder, Douglas-fir and Western redcedar. It should be noted that this area is the focus of an ongoing restoration program. Regions with high densities of Scotch broom can be found in clearings throughout the forested area on the south of the lake, the largest of which can be seen in Figure 4.





**Figure 4:** Simplified Vegetation Community Map (not complete-see detailed vegetation map).

#### 4.5 Fauna

There are a number of significant habitat values provided by the Laughlin Lake ecosystem. There are a number of dead standing trees that provide perches for birds such as the Belted Kingfisher (*Ceryle alcyon*) or Bald Eagle (*Haliaeetus leucocephalus*). These trees are also ideal nesting habitat for cavity nesters (i.e. Tree Swallows *Tachycineta bicolor*). The calm body of water makes an ideal spot for wintering ducks such as the Ring-necked duck (*Aythya collaris*) or Mallard (*Anas platyrhynchos*). Woodpeckers such as the Pileated Woodpecker (*Dryocopus pileatus*) and Hairy Woodpecker (*Dryocopus pileatus*) also utilize the area along with countless songbirds. A complete list of birds observed at Laughlin Lake is presented in Appendix III-iv.

Other fauna that utilize the lake include beavers as evidenced by a lodge on the north shore, fresh cuttings in the forest to the south and several dams at the southeast end of the lake. Beavers are believed to be responsible for the creation of the lake. Pellets have been found indicating use by Coastal Black-tailed Deer (*Odocoileus* sp.)<sup>12</sup>. Other mammals that use the area include bats (due to the high insect populations during the summer), mustelids such as mink and otter<sup>13</sup>.

Amphibians that live in the lake include Pacific Tree-Frogs *Hyla regilla*, Red-legged frogs (*Rana arurora*) and Rough-skinned newts (*Taricha granulosa*). Reptiles include the Common Garter Snake (*Thamnophis sirtalis*) and Painted Turtle (*Chrysemys picta*)<sup>14</sup>. Invertebrates include a number of Dragonflies and Damselflies, Butterflies and Beetles. See Table 3 for a list of species of special concern and Appendix III-iv and III-v for a complete list of birds and other fauna as well as field visit notes by Trudy Chadwin, Rare and Endangered Species Biologist, Ministry of Environment, Lands and Parks, February 12, 2001 (see Appendix III-vi).

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<sup>12</sup> related to Mule deer (*Odocoileus hemionus*).

<sup>13</sup> Community reports of sightings.

<sup>14</sup> Community reports of sightings.

**Table 3:** Species and communities of special concern (Jacqueline Booth and Associates, 1995; see field note summaries in Appendices III-iii, III-iv, III-v, and III-vi).

Species or Community of Concern	Provincial Listing
Great Blue Heron <i>Ardea herodias fannini</i>	-
Red-legged Frog <i>Rana aurora</i>	Blue
Painted Turtle <i>Chrysemys picta</i>	Blue
Blue Dasher <i>Botaurus lentiginosus</i>	Blue
Western Pondhawk <i>Erythemis collocata</i>	Blue
American Bittern <i>Botaurus lentiginosus</i>	Blue
Douglas fir-Salal community	Red
Western Redcedar-Vanilla leaf community	Red
Bolander's Rush <i>Juncus bolanderi</i>	Yellow*

\*Not at risk according to provincial index, however considered rare in Island Trust Fund area (Jacqueline Booth and Associates [JB&A], 1995).

Fish trapping on Laughlin Lake September 17-18<sup>th</sup> 2002 found no fish in the lake, however many colonies of the freshwater bryozoan species (*Pectinatella magnifica*) were found attached to submerged twigs on the lake bottom and along the shore.

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## Section 5.0 Ecological Management

### 5.1 Flora

There are a number of areas within the Laughlin Lake property where invasive species have become well established. In the dryer areas, alien species such as Orchard grass, Canada thistle, and Scotch broom threaten to dominate the vegetation communities. In the riparian area, invasive species include the alien Reed canary grass. As previously mentioned, much of the area between the southeast end of the lake and Vineyard Way has already undergone a significant restoration program. This program has included the removal of exotic species, the planting of native vegetation and the addition of coarse woody debris. This project was largely successful, however regular monitoring and continued restoration of the area will be required as younger Scotch broom plants have already begun to re-establish themselves.

Similar restoration efforts have been initiated in the disturbed areas of the forest to the south of the lake and over much of the peninsula at the southeast end of the lake (Figure 3). De-compaction of the road leading to the peninsula has been completed. This will be followed by native species planting and protection from pedestrian foot traffic through interpretive signage. In summary, management of flora on the property will include the following:

- Monitoring of the effectiveness of past restoration efforts between Vineyard Way and the southeast end of the lake;
- Native plant restoration following Scotch broom removal in the forested area to the south of the lake;
- Native plant restoration following invasive plant removal on the peninsula at the southeast end of the lake;
- Re-vegetation of de-compacted road and;
- Protection of sensitive areas such as newly planted native vegetation with interpretative signage and physical barriers where necessary.

## 5.2 Fauna

As part of the protection of this rich wildlife habitat, it is important to limit human induced disturbances. It is very easy to disturb the birds that utilize the northwest end of the lake. Therefore, there should be no boating on the lake save authorized monitoring/educational activities. Management options related to the fauna of the area include:

- No unauthorized boating;
- No hunting of waterfowl on Laughlin Lake property;
- No fishing;
- Viewing of wildlife from vantage-point (i.e. with binoculars, spotting scope) should be permitted;
- No introduction of amphibian eggs, etc. from other wetlands to prevent the spread of diseases between wetlands;
- No unauthorized activity that may disturb or otherwise threaten wildlife<sup>15</sup>;
- Encourage caution and the use of leashes by dog-owners through interpretative signage and education (a total ban would likely be unenforceable);
- Education of general public on issues regarding the habitat requirements and sensitivity of resident species through interpretative signage.

## 5.3 Ecological Monitoring

Monitoring may be done by Galiano Conservancy Association staff, community members, and/or visiting researchers or students. A number of resources for monitoring are available, the most applicable of which is the Wetlandkeepers Handbook (developed by the provincial government) and the Frogwatch interactive website. As much as possible, monitoring of Laughlin Lake should rely on established monitoring protocols to

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<sup>15</sup> An example of this would be avoiding activities that may suspend silt during January and February when Red legged frogs are laying eggs.

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accommodate participation in the greater scientific community and for ease of application.

Important aspects of a monitoring program include:

- Regular monitoring intervals (i.e. every two weeks or every year);
- Established protocol; and
- Sharable data (i.e. with the Conservation Data Centre).

Parameters of interest in monitoring of Laughlin Lake are as follows:

- Birds (i.e. breeding bird surveys and visual bird counts);
- Amphibians (i.e. Frogwatch protocols);
- Rare animal species such as the Great blue heron (*Ardea herodias fannini*), Red-legged frog (*Rana aurora*), Painted turtle (*Chrysemys picta*), Blue dasher (*Botaurus lentiginosus*), Western pondhawk (*Erythemis collocata*), and American bittern (*Botaurus lentiginosus*);
- Invasive species of flora and fauna;
- Rare plant species and associations such as Bolander's rush, Douglas-fir-Salal community and Western redcedar-Vanilla leaf community;
- Water quality parameters such as pH, dissolved oxygen, and conductivity; and
- Water level / lake depth.

There are a number of monitoring protocols available for each of the parameters listed here. The level of comprehensiveness required for adequate assessment of each parameter should be assessed individually and will inevitably be influenced by the resources available. Where possible, monitoring should be done at least annually and in a consistent manner.

#### **5.4 Fire**

Fire is a constant concern during the summer on Galiano Island. It is important that fire departments have emergency access to water sources on the island, including

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Laughlin Lake. In order to accommodate the local fire department and to prevent habitat destruction during water collection, the Galiano Conservancy Association has installed a stand pipe. This is discussed in Section 9.0 on Facilities.

### **Section 6.0 Education, Research, and Restoration Management**

A number of activities have occurred at Laughlin Lake that are included in the broad category of education, research, and restoration. It is unlikely that any individual activity or cumulative activities will have significant negative impacts on the ecology of the area. However, the sensitivity of many ecosystems to impacts, from even well meaning individuals, requires the establishment of guidelines. In addition to this, these activities are secondary to the fulfilment of the management objectives set out in Section 2.2. As such, these activities should be tempered by the overarching theme of preservation.

#### **6.1 Policy**

Due to the proximity of Laughlin Lake to the Pebble Beach Nature Reserve, it can be viewed conceptually as an extension of the reserve. Therefore, it follows that guidelines for education, research, and restoration management be similar to those established in the Pebble Beach Reserve Management Plan. These policies originally stemmed from the provincial *Ecological Reserve Act* and are as follows:

1. Research, educational use, or restoration within Remnant 'D' District Lot 66 may be undertaken only when authorized and in accordance with both regulations 2 and 3.
  
2. All external projects deemed to have potential for disturbance must seek approval from the Galiano Conservancy Association (i. Staff, ii. Board of Directors, or iii. Pebble Beach Management Committee). External activities should be evaluated on a case by case basis as to their scientific/ social merit versus their potential impacts. Internal projects should be evaluated by staff as to the potential impacts and benefits of each activity whether it be restoration, monitoring, or education.
  
3. Authorization under section 2 shall include the following information:

- 
- A description of the proposed use and, in the case of restoration, the benefits or outcomes;
  - A description of the areas of land to be affected, with an accompanying map;
  - A description of the means of access to be used;
  - The duration of the proposed use;
  - The ecological impact of any activities that will be undertaken within the property boundaries under the authorization;
  - The number of individuals that will be entering the property under the authorization and, where possible, their names; and
  - The name of the individual who will direct the proposed research or educational program.

## 6.2 Guidelines

All research, restoration, and/or education shall follow the Pebble Beach Reserve guidelines once they are finalised. Until then, the following temporary guidelines should be followed by the Galiano Conservancy in evaluation of external and internal activities in Remnant 'D' District Lot 66. Brief written documentation of *major* activities to be submitted to the Board of Directors. For these purposes a major activity is one that may have a significant ecological impact. A major activity is one that includes the following attributes:

- Groups over 20 (including staff);
- Restoration activities involving plant removal and soil disturbance of an area larger than 10m x 10m;
- Monitoring activities requiring disturbing bird habitat near the northwest end of the lake;
- All activities occurring during bird breeding season (spring);
- All activities involving the water during Red-legged Frog breeding (Feb-March);
- If said activity is anticipated to have a significant negative impact on the flora, fauna or water quality of the area.



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Any of these activities initiated by individuals or groups external to the Conservancy, require verbal or written permission and a staff chaperone where possible and/or appropriate.

### **Section 7.0 Access**

The old driveway that extends from Vineyard Way offers the only access point to the lake. Motorized access is primarily for Fire Department water tankers. Pedestrian traffic will continue to be permitted to the vantage-point at the tip of the peninsula at the southeast end of the lake. Figure 5 shows trails and roads that surround the Laughlin Lake Property including the sole legal access trail. It should be emphasized that the Galiano Conservancy Association only owns this access trail and does not condone nor is responsible for activities that utilise existing trails to the south and north of the lake.



**Figure 5:****Section 8.0 Facilities****8.1 Parking**

There is very little room for parking near Laughlin Lake. The trail has been de-compacted and a physical barrier to vehicles has been placed at the road entrance near Vineyard Way. Very few facilities exist on the Laughlin Lake Property. This issue may effect management in the logistics of organizing large groups of people for field trips, educational activities and restoration efforts. Special care will be required especially with regards to large groups of small children on a road, where perhaps passing drivers are not expecting any.

Pending the completion of the Pebble Beach Nature Reserve, Lot 1, Plan 18194, of D.L. 66 may provide an opportunity to establish a parking area. The area is currently used for a gravel storage area and therefore has already been significantly impacted. This potential parking area should be considered in the long term management of this area.

**8.2 Trails**

There is only one trail available for legal use. It extends from Vineyard Way to the end of the peninsula. This road has been de-compacted and an official trail delineated. The road was not de-compacted near the entrance in order to facilitate fire department access to water (to be discussed in Section 8.4). Improvements to this small section of trail are as follows (see Figure 6):

- De-compaction of old road;
- Delineation of trail;
- Restoration of trailside vegetation;
- Construction of physical barrier to motorized transportation; and
- Installation of foot bridge over seasonally visible section of Greig Creek.



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**Figure 6:****8.3 Trail Network**

As seen in Figure 6, there is a trail that lies immediately to the south of Laughlin Lake. This trail runs along old roadbeds and eventually connects with Bodega Ridge Park. It trespasses over Lot 5, D.L. 66 and Lot 15 of D.L. 67 (see Figure 2). As part of a long-term vision, the Conservancy, with help from other interested partners may want to pursue the development of this trail network. This may occur through partnerships with the owners of Lot 5 and Lot 15 or through the actual purchasing of these lots. As these lots are not of immediate conservation concern, it may not be in the Conservancy's best interest to attempt the purchase of these alone.

**8.4 Stand Pipe**

In realization of the variety of societal values that derive from Laughlin Lake, the Galiano Conservancy Association acknowledges the value of Laughlin Lake as a source of water to the local fire department. In keeping with the objectives of this Management Plan, the Conservancy sought to develop a means to accommodate the collection of water for fire purposes at a minimal disruption to the lake, Greig Creek and surrounding flora and fauna. In the past, fire trucks would drive down to the lake and collect water from the dredged area in the south. The installation of a stand pipe in this area that runs to the trail head (see Figure 6) allowed for de-compaction of the road and for other aforementioned improvements. It should be emphasized that use of Laughlin Lake for fire department purposes is only permitted in the case of an emergency.

**8.5 Waste Facilities**

The property of Laughlin Lake does not currently have waste facilities such as toilets or garbage cans. At this time, there are no plans for installation of such facilities.

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## **Section 9.0 Legal Management**

### **9.1 Insurance**

The Galiano Conservancy Association has liability insurance to the amount of five million dollars on the Laughlin Lake property (see Appendix I-viii).

### **9.2 Land-use Designation**

As mentioned in Section 1.7, Remnant 'D' of District Lot 66 is currently zoned as Rural 2 (R2). As such the Galiano Conservancy Association is free to perform restoration activities, construct the stand pipe, and allow fire truck access. It is suggested that following the planned activities, the Galiano Conservancy Association should seek rezoning of the property as 'Nature Protection' under the Official Community Plan (see Appendix IV-i).

The Objectives and Policies of land zoned as Nature Protection (NP) is described in the Galiano Island Official Community Plan (see Appendix IV-i) as follows:

#### *Nature Protection Objective*

*The objective of this subsection is:*

- 1) *To preserve natural values.*

#### *Nature Protection Policies*

- a) *A separate zone for conservation shall be applied to new and existing Nature Protection areas.*
- b) *Land covenanted against further development or subdivision shall be identified through appropriate zoning designation.*
- c) *B.C. Parks shall be requested to continue a public consultative process of developing and periodically reviewing management plans for all ecological reserves in the Galiano Island Trust Area.*

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- d) *Zoning for Nature Protection may permit trails and uses permitted as specified in the Ecological Reserves Regulations pursuant to the Ecological Reserves Act.*
  - e) *Where Nature Protection areas meet the high tide line, the water and foreshore shall be zoned for protection.*

As set out in Land use Bylaw 127 (see Appendix IV-ii), rezoning to Nature Protection (NP) would stipulate the following:

*Permitted Uses*

*11.1.1 In the Nature Protection zone the following uses are permitted, subject to the regulations set out in this section and the general regulations set out in Parts 2 and 3, and all other uses are prohibited.*

*11.1.1.1 Ecological reserves and nature conservancies*

*11.1.1.2 Research and educational activities*

*11.1.1.3 Groundwater retention and recharge*

*Buildings and Structures*

*11.1.2 No buildings or structures of any kind, other than signs, are permitted.*

According to the Galiano Island Official Community Plan, " c) All rezonings shall go to a public hearing." Therefore, adequate preparations should be made in anticipation of such a hearing.

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## **Section 10.0 Implementation**

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

- Installation of stand pipe (completed);
- De-compaction of road (completed);
- Construct trail and bridge (completed); and
- Assessment of resources available for monitoring program co-ordination by Galiano Conservancy Association staff and Board of Directors. Perhaps seek funding for an overall monitoring co-ordinator.

### **10.2 Mid term (within 1 year)**

- Re-vegetation of de-compacted road (initiated);
- Assessment of restoration needs of the disturbed area between the Southern end of the lake and Vineyard Way;
- Assessment of restoration for forested area south of lake;
- Assessment of restoration of areas with high densities of invasive species; and
- Initiate annual monitoring of invasive species.

### **10.3 Long term**

- After restoration activities have been completed, apply for rezoning to ‘Nature protection’ land-use designation;
- Increase data transfer from monitoring programs at Laughlin Lake with broader programs;
- Consider the creation of a parking area on Lot 1, Plan 18194, D.L.66 pending the completion of the Pebble Beach Nature Reserve; and
- Consider establishing the connection of a trail network from Pebble Beach to Bodega Ridge. This would involve participation from a number of community members and groups and perhaps private land-holders.



#### **10.4 Ongoing and Monitoring Actions**

- Breeding bird surveys take place annually at Laughlin Lake; and
- Educational activities that promote restoration, monitoring, and nature appreciation.

**Acknowledgements:**

I would like to thank all those involved in the development of this management plan. Foremost, I wish to extend gratitude to the members and staff of the Galiano Conservancy Association for the opportunity to work alongside such a competent and effective group of individuals. Special thanks to Keith Erickson for mapping and field work assistance and Ken Millard for overall guidance on this project. Biological inventory data provided by Trudy Chadwin, Bruce Whittington, Claudia Copley, and Mike Hoebel was greatly appreciated. Lastly, I would like to thank the Real Estate Foundation of B.C. and Capilano College for funding that made this project possible.

**Author's Biography:**

Steven Gates is originally from a small forestry town in Nova Scotia. He received his undergraduate training in biology at Dalhousie University, Halifax, N.S. Steven worked at the Galiano Conservancy Association for two months to fulfill the practicum component of the Capilano College Post-Baccalaureate Environmental Science Program and currently works as a contract field biologist in Eastern Canada.

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## **Appendix I: Legal Documents**

- I-i Current Land Title Information
- I-ii Covenant EJ107461
- I-iii Covenant EJ1077463
- I-iv Covenant EJ107465
- I-v Covenant EJ107471
- I-vi Easement EK56114
- I-vii Lot 5 and Lot 6 Covenant EJ107469
- I-viii Lot 5 Easement EJ107477/ EJ107478
- I-viiii Insurance policy

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## **Appendix II: Historical Documents**

II-i 1873 Pre-emption and accompanying map

II-ii 1888 Crown Grant and accompanying map

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## **Appendix III: Biological Inventory**

III-i Limnological Report prepared by Steven Gates.

III-ii Bathymetric map prepared by Keith Erickson with Field assistance from Steven Gates.

III-iii Vegetation Community Map.

III-iv List of Bird Species found at Laughlin Lake.

III-v List of Fauna observed at Laughlin Lake by Bruce Whittington and Claudia Copley.

III-vi Field Notes from Trudy Chadwin, Rare and Endangered Species Biologist, Ministry of Environment, Lands and Parks, February 12, 2001.

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## **Appendix IV: Relevant Legal Text**

IV-i Official Community Plan Text

IV-ii Official Community Plan Land Use Bylaw Text