# Management Plan for
# TRINCOMALI NATURE SANCTUARY,
## Galiano Island, BC

Updated and Approved by
the Trust Fund Board, 2013


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## EXECUTIVE SUMMARY

In February 2001, Islands Trust Fund (ITF) acquired 12 hectares of partially forested land on Galiano Island, for the purpose of establishing a nature sanctuary. It is ITF's policy to develop management plans for all properties it acquires and update the management plans every 10 years. Searle & Associates was retained in April 2001 to provide an overview site inventory, conduct a stakeholder charette, receive public comment and develop the management plan for this property.

This document is the 2013 updated Management Plan for Trincomali Nature Sanctuary (TNS), submitted by Habitat Acquisition Trust (HAT), the Management Group for TNS, and approved by the Islands Trust Fund Board (the Board).

The principal objectives of this plan are to:

- provide an overview of environmental features and values of the property;
- identify current and long-term management concerns; and
- make recommendations for management strategies and actions to address the identified concerns and the long-term protection of environmental values and natural character of the site.

This management plan was compiled from existing data sources, field visits and discussions with experts. The principle findings are:

- The Coastal Bluff ecosystem on TNS is of extreme importance within the Sensitive Ecosystem Inventory Study Area (Eastern Vancouver Island and the Gulf Islands) and is sited in the ITF 2011-2015 Regional Conservation Plan as a sensitive ecosystem, due to its rarity and susceptibility to disturbance, and is a biodiversity priority for the region;
- Red and blue-listed species occur within the property; and
- Trincomali Nature Sanctuary contributes to conservation planning in the region, as part of the Regional Green/Blue Spaces Strategy and highlighted as an important property in the ITF 2011-2015 Regional Conservation Plan

The plan addresses management of landscape components including:

| | |
|---|---|
| Coastal bluff and Woodland Ecosystems | Appropriate Recreational Use |
| Falcons and Cormorants | Signage |
| Older Forest Ecosystem | Zoning |
| Recently Logged Area (2$^{nd}$-growth) | Monitoring Program |
| Sharp-tailed Snake Habitat | Non-indigenous vegetation |
| Logging Slash Piles | Fire Management |
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# 1.0 Introduction

## 1.1 The Islands Trust Fund

The objective of the Islands Trust is:
"…to preserve and protect the Trust Area and its unique amenities and environment for the benefit of the residents of the Trust Area and of British Columbia generally, in co-operation with municipalities, regional districts, improvement districts, other persons and organizations and the government of British Columbia."

The *Islands Trust Act* (the *Act)* established the Islands Trust Fund (ITF) "for the purpose of carrying out the objective of the Trust." The *Act* also established the Trust Fund Board "to administer the Trust Fund and to manage the real and personal property assets of the Trust Fund." The Board is authorized to acquire and hold money, land, and interests in land within the Trust Area for purposes of carrying out the objective of the Islands Trust. The Trust Fund Plan (TFP), prepared by the Trust Fund Board in accordance with the requirements of Section 44 of the *Act*, outlines the vision, priorities, goals, and policies of the Board and actions which will be taken to support the objectives of the Islands Trust.

The Islands Trust Fund (ITF) assists in implementing this objective by establishing nature reserves and nature sanctuaries and by working with interested landowners to protect special features and values on their private lands through voluntary conservation initiatives.

The vision of the Islands Trust Fund is that the islands and waters of the Strait of Georgia and Howe Sound will be a vibrant tapestry of culture and ecology where humans live and work in harmony with the natural world. This special place will have a network of protected areas that preserve in perpetuity the native species and natural systems of the islands. Engaged residents and conservation partners will work together to protect large natural areas and key wildlife habitat. Viable ecosystems will flourish alongside healthy island communities.

The mission of the Islands Trust Fund is to protect special places by encouraging, undertaking, and assisting in voluntary conservation initiatives within the Islands Trust Area.

These voluntary conservation initiatives include:

- conservation education;

- land donations and acquisitions to create protected areas; and
- private land stewardship through conservation covenants and similar tools.

Islands Trust Fund property management plans are used to provide direction and guidance for the management, maintenance, and protection of its Nature Reserves and Nature Sanctuaries.

A management plan:

- Provides general and descriptive information on the property, including location, history, and land use;
- Sets out the conservation goals and objectives for the property;
- Identifies the property's ecological and/or cultural values and features;
- Describes the management issues associated with the property; and,
- Provides short, medium and long-term management recommendations (action items or tasks) on issues such as:

    - invasive species management;
    - species at risk protection;
    - public access and safety;
    - educational and research opportunities; and
    - signage needs.

Once a management plan is complete, the Islands Trust Fund works with local conservancies and community partners to carry out the management actions or strategies identified in the plan as resources allow. As a general practice, the Islands Trust Fund aims to update each management plan every ten years.

## 1.2 Sanctuary Background Summary

The ITF acquired a 12 hectare parcel of partially forested land on Galiano Island in February 2001 for the purpose of establishing a nature sanctuary. Searle & Associates (Rick Searle, Jen Paul and Bruce Whittington) was retained in April 2001 to provide an overview site inventory, conduct a stakeholder charette, receive public input and develop a management plan for the property. An ITF management plan provides long-term direction and guidance for the management of values and features of significance on properties owned by the ITF. The management plan includes a biophysical description of the property, an

overview of present land use and zoning, identification and discussion of management priorities and concerns, and recommendations of short and long-term management strategies. The ITF adopted Trincomali Nature Sanctuary (TNS) as the name for the site. In this document, the Trincomali Nature Sanctuary is also referred to as the TNS or the Sanctuary.

# 2.0 Sanctuary Description

## 2.1 Purpose

The purpose of establishing this nature sanctuary was threefold:

1. to protect key bird nesting habitat (including one red-listed species, two blue-listed species, and one yellow-listed species);
2. to maintain the Coastal Douglas-Fir forest and provincially designated sensitive ecosystems and rare species found in the Sanctuary; and
3. to protect this site as a means to achieve the objectives of the Islands Trust.

## 2.2 Overall Objectives

The objective of the management plan is to provide overall direction that will protect the natural state of the property. The objectives for management of the TNS include:

- allowing natural ecological processes to function without human interference, except in the case of wildfire; and
- ensuring that permitted uses will not significantly impair the natural condition of the site or affect the special ecological features, wildlife or other natural resources of the Sanctuary.

## 2.3 Report Methods

Information gathered for the 2002 Management Plan was derived from four general sources:

- Site visits;
- A review of relevant scientific and government publications and databases;
- A stakeholder charette; and
- Discussions with relevant experts.

Rick Searle, Bruce Whittington and Jennifer Paul conducted a reconnaissance site visit on June 14, 2001, with the assistance of Derek Astbury, Sanctuary Warden at the time.

A stakeholder charette was conducted on July 12, 2001. In attendance were:

- Derek Astbury, Sanctuary Warden
- Adolf Ceska, Conservation Data Centre (CDC)
- George Clulow, Wild Bird Trust (prior Management Group)
- Paula Hesje, The Land Conservancy of B.C. (covenant holder)
- Debbie Holmes, Galiano Island Trustee
- Jennifer Paul, Consultant
- Rick Searle, Consultant
- Bruce Whittington, Habitat Acquisition Trust (covenant holder) and Consultant

Since 2001, site visits and monitoring events have been scheduled regularly by the ITF, the Management Group and covenant holders in order to assess management activities and the current state of the Sanctuary and to monitor the site for compliance to the conservation covenant terms.

Information was also obtained for the initial Management Plan through conversations with such bird experts as David Fraser (Endangered Species Specialist, Ministry of Water, Land and Air Protection[1]); Trudy Chatwin (Rare and Endangered Species Biologist, Ministry of Water, Land and Air Protection); and Don Doyle (Ministry of Water, Land and Air Protection). Information regarding groundwater was obtained through a discussion with William Hodge (Groundwater Hydrologist with the Ministry of Water, Land and Air Protection). Norm Bennett with the Ministry of Transportation provided information relating to ditching practices along Porlier Pass Road.

Public comment was solicited through an advertisement in the Active Page on Galiano Island in July 2001. No submissions were received from the public.

For the 2013 update, information was obtained through research and input from the following individuals:

[1] Currently the "Ministry of Forests, Lands and Natural Resource Operations"

- Trudy Chatwin: Species at Risk Biologist (Ministry of Forests, Lands and Natural Resources Operations)
- Emma Smith: Sanctuary Warden and volunteer firefighter with the North Galiano Volunteer Fire Department
- Tom Darby: Chief, North Galiano Volunteer Fire Department
- Jeff Ralph: Property Management Specialist, Islands Trust Fund
- Wendy Tyrell, Habitat Acquisition Trust
- Andrew Mackinnon, The Land Conservancy of B.C.
- Keith Erickson, Galiano Conservancy Association

## 2.4 Local and Regional Context

### 2.4.1 Location

The Sanctuary is located mid-point on the southern coast of Galiano Island off of Porlier Pass Road, approximately 12.8 km from the Sturdies Bay Ferry Terminal (Figure 1).

### 2.4.2 Legal Description

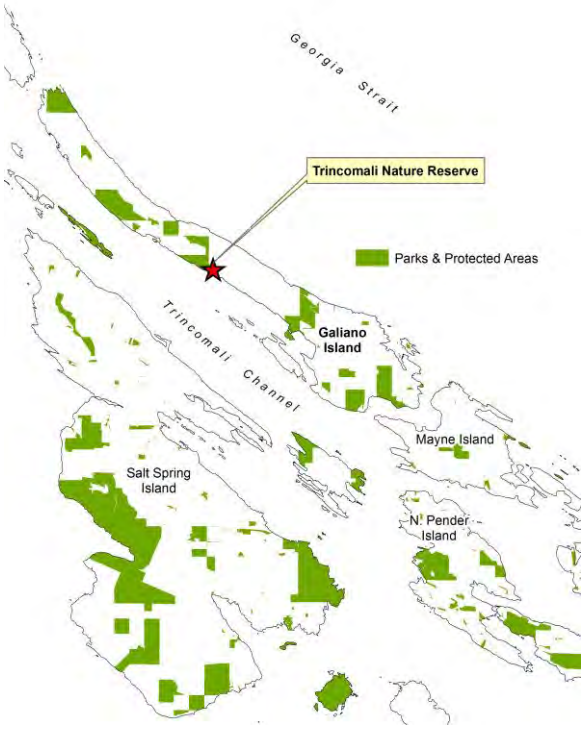
The legal description of the subject property is: Lot A, District Lot 55, Galiano Island, Cowichan District, Plan VIP 71892; PID: 024-943-592. See Appendix 2, Figure 3 for a copy of the Sanctuary reference plan.

### 2.4.3 Regional Context

The 2002 Management Plan stated that the regional importance of this property fulfills the priorities of the Provincial Capital Commission's and CRD Parks' Regional Green/Blue Spaces Strategy. Maintaining green/blue space values is considered a priority where:

- the land contains lands identified in the SEI; and/or
- the area would help meet the objectives of the Regional Green/Blue Spaces Strategy (CRD/PCC 1997).

**Figure 1. Trincomali Nature Sanctuary - Regional Context Map**




Extensive Terrestrial Ecosystem Mapping has been acquired for the Islands Trust Area in the last 10 years since the original management plan, created in partnership with ITF, Parks Canada and the Ministry of Environment. The Islands Trust Fund used the Terrestrial Ecosystem Mapping to form the basis for Sensitive Ecosystem Maps to determine which ecosystems are most rare and which are most threatened by development. The ITF 2011-2015 Regional Conservation Plan uses this mapping to focus on those ecosystems in greatest need of protection and it highlights the Cliff ecosystem that is found in TNS as one of these. Cliff ecosystems are regionally rare making up less than 0.1% of the landscape of the Islands Trust Area.

### 2.4.4 Local Context

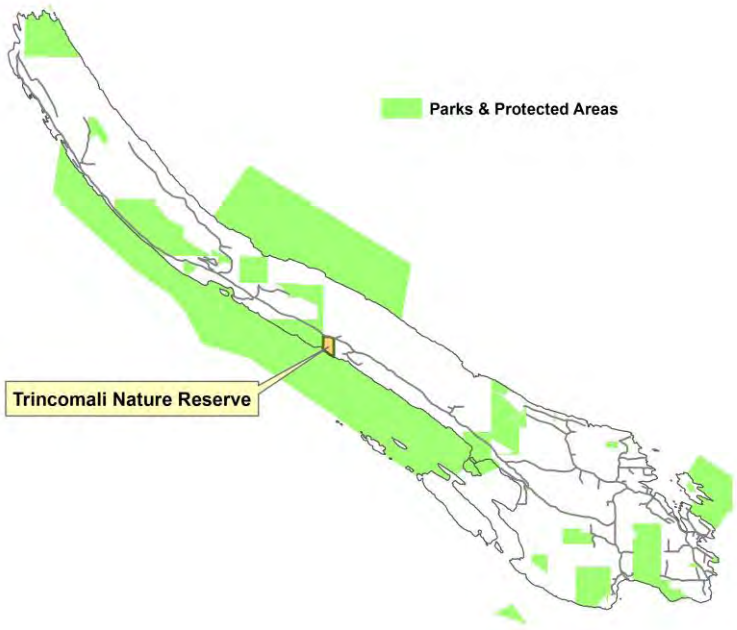
Galiano Island is bound by the Strait of Georgia to the Northeast and Trincomali Channel to the Southwest (see Figure 1). TNS is part of the Mid-Galiano Conservation Network (see Figure 3), which is an over 500 hectares contiguous network of properties that protects a significant portion of the Island's topographic variation and associated ecological diversity, securing valuable pathways for plant and animal migration within and between two major watersheds, as well as from sea level to Galiano's highest ridgeline. The large area and connectivity secured by

the network ensures that a diverse mosaic of adjacent natural habitats can function to provide for seasonal and life stage requirements of many species. Connections between protected areas and among patches of natural habitat are particularly critical for ecological resiliency to climate change, as organisms will have to move with shifting habitat conditions if they are to survive.

The Mid-Galiano Conservation Network connects TNS to Bodega Ridge Provincial Park via a corridor comprising of the Galiano Restorative Learning Centre Land on DL 57, DL 58 Nature Reserve, Great Beaver Swamp Nature Reserve, Cable Bay Nature Reserve, Laughlin Lake Nature Reserve (see Figure 3).

Fisheries & Oceans Canada have implemented 164 Rockfish Conservation Areas in an attempt to recover rockfish populations. A Rockfish Conservation Area was classified along the shoreline of TNS (see Figure 2 and 3). Within Rockfish Conservation Areas, any fishing activities that impact on rockfish, lingcod, or their habitat (including activities resulting in bycatch of these species) are prohibited.

**Figure 2. Trincomali Nature Sanctuary - Local Context Map**

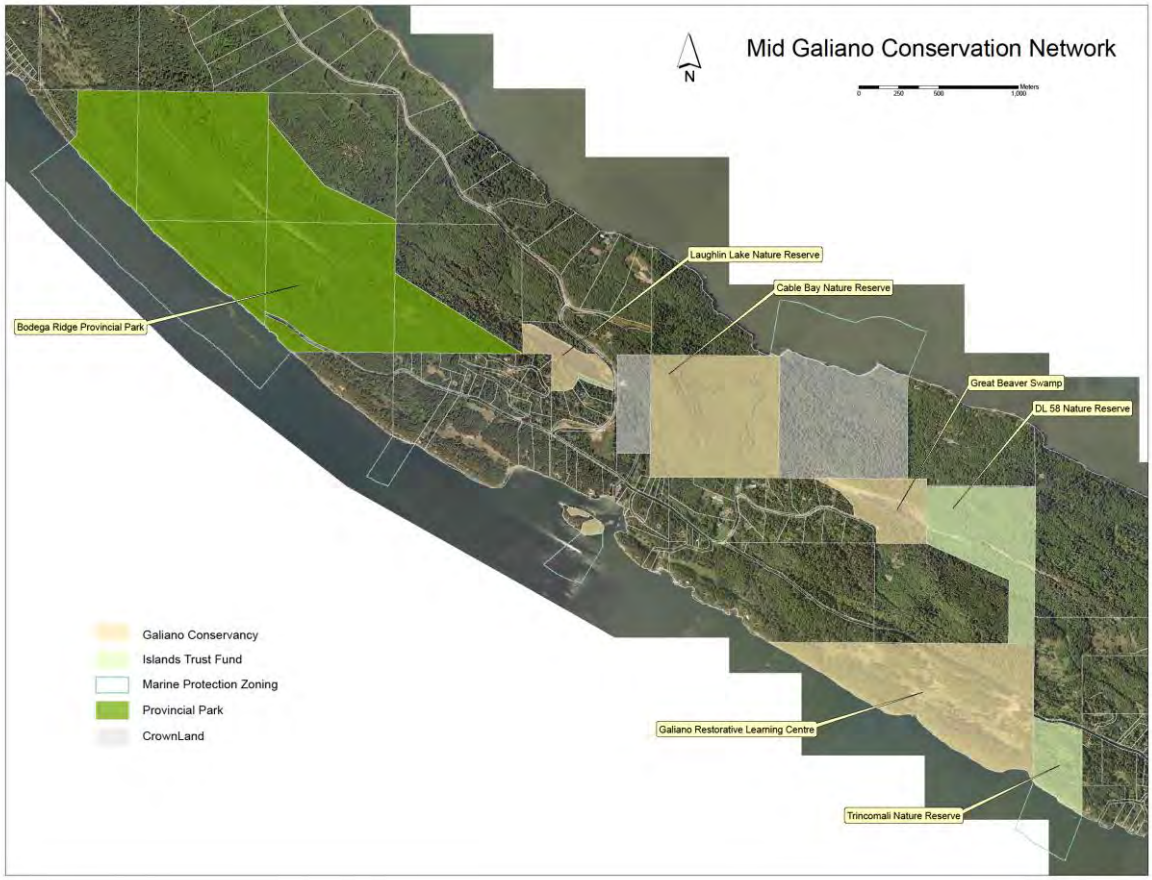



Trincomali Nature Sanctuary includes over 400 metres of intact coastal bluff ecosystem, which is identified in the Sensitive Ecosystems Inventory (SEI) as a Woodland/Coastal Bluff ecosystem (SEI Ministry of Environment 2004). Coastal bluffs is one of the rarest of all sensitive

ecosystems in the SEI study area[2], representing only 0.3% (1043 ha) of the entire study area (32,510 ha) (McPhee et al. 2000) and the site is therefore considered to have high provincial significance.

There is a small spring close to the north-west boundary of the Sanctuary near Porlier Pass Road. This spring is the source of water for an adjacent wetland north of the Sanctuary. The CDC identifies wetlands as an ecosystem of conservation concern. Wetlands make up 1.7% of the entire SEI study area. The CDC recommends that vegetated buffers be delineated around each wetland ecosystem as they are sensitive to adjacent land use. The TNS protects the source and prevents disruption to the adjacent wetland.

**Figure 3. Mid Galiano Conservation Network**




[2] The SEI was a joint federal-provincial project that identified and mapped native vegetation communities of conservation significance into nine broad categories. The first phase SEI study area includes all of the Gulf Islands within the Islands Trust Area and extends beyond to include the east side of Vancouver Island and the Capital Regional District.

Human use likely dates back thousands of years in terms of aboriginal use of the area. The Sanctuary is currently used for recreational hiking by local residents, though it is not heavily visited, perhaps less than 20 people per year (pers. comm., E. Smith). There is a loop trail along the former logging road in the recently logged area and a foot-path along the bluffs. Access to these trails is from either Porlier Pass Road or the adjacent properties to the east. The 2002 orthophoto below shows the old logging roads/trails and the older forest along the bluffs (Figure 4). Figure 5 shows the tree and vegetation growth that has occurred in the last 11 years. See Figure 6 on page 14 for a map drawing of the trails and other features found in the Sanctuary.

**Figure 4. Trincomali Nature Sanctuary Orthophoto -2002**

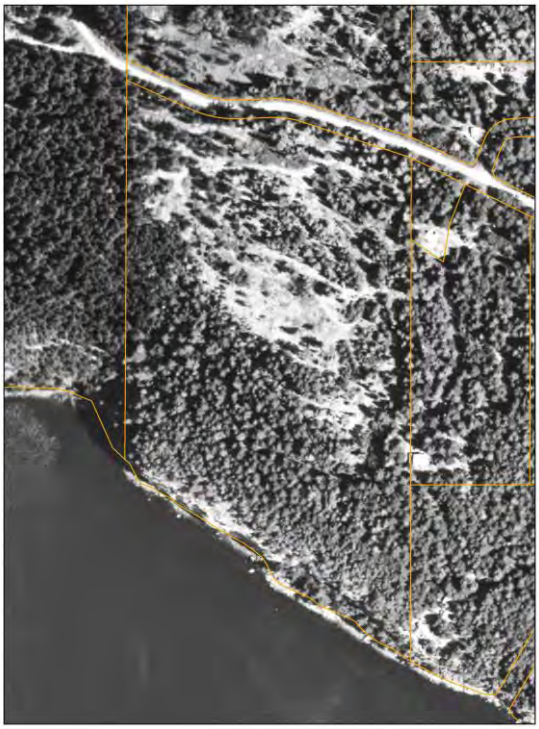


**Figure 5. Trincomali Nature Sanctuary Orthophoto -2013**

## 2.5 Management

From 2001-2009 the Wild Bird Trust was the Sanctuary Management Group for TNS.

In 2009, a formal management agreement was signed between the Board and Habitat Acquisition Trust to ensure long term management of the Sanctuary in accordance with this Management Plan. This updated plan references HAT as the current Management Group.

## 2.6 Site History

### 2.6.1 Ownership

The 12 hectare waterfront parcel was created when District Lot 55 to the north was subdivided through a section 99 subdivision. Prior to subdivision, District Lot 55 originally consisted of approximately 45 hectares (111 acres) and was most recently owned by Daysgoneby.org Land Stewards Ltd., which had purchased it from Pilaster Holdings Limited in March 2000. Pilaster Holdings purchased the property from MacMillan Bloedel in May 1993. Islands Trust Fund and The Land Conservancy of B.C. cooperated to purchase the property as a public trust in February 2001.

### 2.6.2 Logging

Logging occurred from 1994 to 2000 in a large section of the property, approximately 150-200 metres into the parcel from Porlier Pass Road. In this plan, this area is referred to as the 'recently logged area'. Records indicate that the older forest, south of the recently logged area to the bluffs (see Figure 4), was high graded in 1915 (GCA 2000). This portion is referred to as the 'Older Forest' in this plan.

### 2.6.3 Percolation Test Holes

In the early 1990s, in preparation for subdivision by Pilaster Holdings, four wells were drilled in the central portion of the land. There are also a number of percolation test holes that were dug in a variety of locations. These test holes have not been filled but do not appear to pose a safety issue (Baseline Report 2000).

### 2.6.4 Easement

In the southeast corner of the Sanctuary, there is a cement patio and small trail leading from the patio to the adjacent property. At the time of acquisition, an easement was granted to these neighbouring landowners allowing continued access and use to and from the patio for personal use (Baseline Report 2000). The landowner at that time was also the Sanctuary Warden for the TNS and instrumental in acquiring the property. The easement is on title for perpetuity and extends to all future landowners. See Appendix 2, Figure 4 for a copy of the easement plan.

### 2.6.5 Fire History

For this biogeoclimatic zone fire was historically a part of the natural cycle. Tree scars on many of the larger older trees are indicative of a fire in past years. With the current management goals set at reducing fire hazards and suppressing natural wildfires, the Sanctuary will continue to accumulate small and coarse woody debris in the understory of its forests; thereby creating an increase in fuel load that requires ongoing fire hazard potential assessment, and possibly employing management techniques to assist in the reduction of fuel loading.

Biomass Controlled Burns

In winter 2012, a controlled burn in a previously disturbed section of the recently logged area was done in order to dispose of a large accumulation of Scotch Broom (*Cytisus scoparius*) removed from the Sanctuary that season. The burn was successful, and left a small scar foot-print (Appendix 3, Photo Group 2010-2013).

Recent invasive plant removal activities in TNS have led to management considerations on the disposal of the large Broom biomass remaining after large pulls. In 2009/2010, during Broom removal events along the bluffs and woodlands, the Broom was randomly distributed in small piles throughout the adjacent Older Forest. (Odin Scholz 2009/2010) and they remain, with little evidence of decomposition in 2013.

Broom removed in 2011 in the recently logged area was hauled out to the Sanctuary Warden's property to the east and burned by the Warden, which was labour- and time-intensive. In 2012, this dilemma was discussed by all parties and it was decided that the best management practice for disposal of the biomass of invasive species removal efforts would be to burn on site. The major requirements being that the burn site is in a pre-determined location in an already heavily disturbed area

within the recently logged area and close enough to Porlier Pass Road for firefighting equipment to access in case of emergency. As noted, the first controlled burn was done in the Sanctuary in February of 2012, following four days of invasive species removal.

Neighbouring Residential Fire (2012)

In October 2012, the neighbouring property to the east (Lot 3) experienced a fire that destroyed the main house (the former Astbury Property). Only the guest house and garage remained. The Galiano Island Volunteer Fire Department succeeded in keeping the fire out of the Sanctuary. Two other spot fires spread to the cliffs below the house and Sanctuary, and thanks to the heroics of local residents, these spot fires were extinguished before the fire could spread to the Sanctuary.

E. Smith, Sanctuary Warden and volunteer firefighter, alerted ITF and HAT of the fire the following morning. Another Sanctuary Warden responsible for the bluffs and shoreline area stated that there was little evidence of the fire directly below the house, and no apparent damage to the lower portion of the Sanctuary along the bluffs and shoreline; however burnt embers were found along the top of the bluffs, over 50 metres west from the site of the fire.

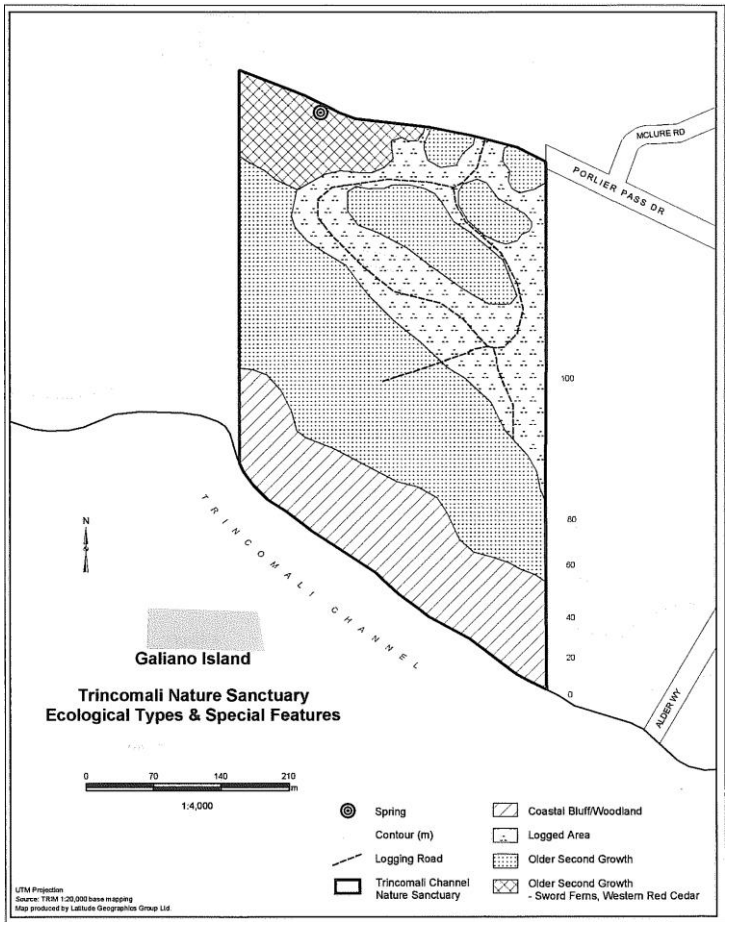
**Photo 1. Residence Fire Remains**

# 3.0 Physical and Natural Features Description

## 3.1 General Physical Description

TNS includes over 400 metres of waterfront and an intact coastal bluff ecosystem with a southwest exposure. Over one-quarter to a third of the parcel that was actively logged in the northern portion from 1994-2000, is naturally regenerating into a second-growth mixed forest with a significant Scotch Broom infestation. The area of the Sanctuary south of the recently logged area is comprised of mature and older growth forest and Arbutus/Douglas-fir woodlands. The waterfront portion of the property, which features rocky woodlands, bluffs and steep cliffs, provides important habitat for seabird colonies. The map on the following page (Figure 5) shows the features and ecological communities found in the Sanctuary.

**Figure 6. TNS Ecological Types & Special Features -2002**



## 3.2 Geology and Physiography

The environmental inventory includes an overview of geology and physiography, soils, watercourses, and biological resources.

Galiano Island is entirely underlain by the sedimentary formations of Upper Cretaceous age. The sandstone of the Coastal Bluffs has been cracked, faulted and eroded providing suitable nesting habitat for a significant colony of both Double Crested and Pelagic cormorants.

**Photo 2. Coastal Bluffs with Seabird Nesting Colonies**

Site topography begins at Porlier Pass Road with an approximate elevation of 80 metres rising to an elevation of over 100 metres. Heading further south towards Trincomali Channel, there is a ridge (a distance of about 100 metres from the ocean) which drops off to a plateau. This plateau extends to an abrupt rock face at Trincomali Channel.

## 3.3 Soils

The two main soil types on the property are Rock and Saturna (Ministry of Environment 1989). The majority of the inland portion of the property consists of Saturna soils. These soils are well drained having developed on shallow deposits of channery, sandy loam to channery, loamy sand texture, colluvial and glacial drift materials over sandstone bedrock within 100 cm of the surface. Coarse fragment content varies between

20-50% (Green et al. 1989 p.65). Typically the Saturna soils are moist throughout the late fall to spring but are droughty during summer. During and shortly after wet periods, water may flow laterally through the saturated subsoil on top of sloping bedrock. The soil phase of this inland portion is of the variant *sl* indicating that the bedrock is within 50 cm of the surface (Green et al. 1989).

The well-drained, thin soils of the Saturna group support the dry variant of the Coastal Douglas-fir Biogeoclimatic Zone. Generally, the understory tends to be fairly sparse, consisting largely of Salal and Oregon-grape. The dry climate and well-drained soils are ideally suited for the Douglas-firs that form semi-open forests partially shading the ground. Douglas-fir are shade-tolerant and will likely dominate the landscape through many successive generations since this forest type does not produce large amounts of litter or deadfall to create enough organic material for hemlocks to become established.

A Sword fern/Douglas-fir community exists just south of Porlier Pass Road. This community also grows in the Saturna category of soils but along a north-facing slope, which is cool and moist due to the presence of groundwater seepage and a spring. A few Western Redcedars also occur in this moister area.

The coastal portion of the property is classified as the Rock Saturna map unit (Ministry of Environment 1989). This map unit consists dominantly of sandstone bedrock exposed or covered by less than 10 cm of mineral soil. It also contains subdominant proportions of well-drained soils developed on shallow, channery, sandy loam to channery, loamy sand textured, colluvial and glacial drift materials over sandstone bedrock. The soil typically has 20-50% coarse fragments (Green et al. 1989). These extremely well-drained soils support mosses, grasses and an Arbutus/Douglas-fir community. This type of soil is quite prone to erosion.

## 3.4 Watercourses

There is an active spring located just south of the northern boundary of the property. However, it is interesting to note that the Water Management Office stated that their maps show no surface water sources for D.L. 55. No other watercourses or wetlands exist on the property.

**Photo 3. Active Spring off of Porlier Pass Road**

## 3.5 Biological Resources

The biological resources of the Sanctuary are described under the headings of:

- Vegetation Communities;
- Wildlife and Wildlife Habitat;
- Fish and Fish Habitat; and
- Fire History.

### 3.5.1 Vegetation Communities

The Sanctuary lies within the Moist Maritime Coastal Douglas-Fir Biogeoclimatic Subzone (CDFmm). The entire parcel is included in the broad expanse of the Provincially Red-listed Douglas-fir/Dull Oregon-grape forest community that runs along the entire length of Galiano Island. This rare vegetation community once dominated the landscape within its range. Due to the extensive timber harvesting and land conversion uses for development and agriculture, these forests are now severely fragmented and there are no older forests of any significant size remaining. The remaining stands of old forest in less developed areas are few and far between with only a little under permanent protection.

The northern, recently logged area of the Sanctuary is comprised of a maturing second-growth mixed forest with Douglas-fir, Grand fir and Western Redcedar comprising the majority of the canopy that was harvested within the last 60 years. There is a significant population of Scotch Broom in the understory due to the recent logging activity, with minor populations of other invasive species such as, Himalayan and Cutleaf Evergreen Blackberry (Rubus *armeniacus* and R. *laciniatus*), English Holly (Ilex *aquifolium*) and English Ivy (Hedera *helix*). The Sensitive Ecosystem Inventory (SEI) classifies this area as a Second-Growth coniferous forest, with a majority of the area recorded as disturbed from the recent logging activities. The remainder of the parcel is comprised of three vegetation communities that are classified under the SEI as sensitive ecosystems: Older Coniferous Forest, Woodland, and Coastal Bluff.

The Coastal Bluff and Woodland ecosystems are comprised of an Arbutus/Douglas-fir community. The understory is quite open with reindeer lichen, Oregon-beaked Moss and Juniper Haircap Moss. Hairy Manzanita was observed during the 2001 site visit on some steep ledges along the bluffs.

The Woodland grades north into a maturing older second-growth forest consisting of a Douglas-fir/Western Redcedar/Salal community. Within this portion of the property there are many large Douglas-fir and Cedar trees which tower above the older second-growth trees resulting from logging in the early century. The SEI inventory has this ecosystem delineated as Older Forest.

**Conservation Data Centre Site Evaluation of DL 55, Galiano Island**

On July 12, 2001, staff from the BC Conservation Data Centre (CDC) made a field visit to the Sanctuary. The site, although extensively logged, still retains some fairly high conservation values in the undisturbed portions of the property. A species list from 19 vegetation sampling areas within the property is found in Appendix 1, Table 1 with species listed separately for each area surveyed.

3.5.1.1 Ecological Community Overview (2001)

There is an occurrence of the provincially-ranked S2 red-listed plant community Douglas-fir/Arbutus at the top of the bluff. The presence of the plant Harford's Melic Grass (*Melica harfordii*), although not currently tracked by the CDC, is significant here, as this species is not commonly

found in southern BC. There are small size occurrences of the S1 red-listed Garry Oak/Arbutus and S1 red-listed Douglas-fir/Garry Oak-Oceanspray communities on the bluff at the shoreline. The stand of Hairy Manzanita is part of the S2 red-listed Arbutus/Hairy Manzanita woodland plant community. The Older Forest north of the bluff was not sampled, but shows a diversity of shrub species typical of ravines in this ecoregion.

**Figure 7. CDC Sensitive Ecosystem Inventory Map**


3.5.1.2 Changes in the Ecological Community Conservation Status (2013)

The rare plant community occurrences mentioned above had not yet been mapped by the CDC at the time of their site visit in 2001. In 2004, the CDC updated their SEI inventory for Southern Vancouver Island and the Southern Gulf Islands. The Sensitive Ecosystems Map in Figure 7 shows the SEI and rare species polygons that are currently designated by the CDC in the Sanctuary. In 2013, Harford's Melic Grass (*Melica harfordii*), was reclassified as S3, blue listed, by the CDC.

The only listed community that the CDC has mapped on Galiano Island is the Douglas-fir/Dull Oregon-grape community. The other sensitive communities listed below have been observed but not mapped, and are noted here for reference only. Additional fieldwork is needed to determine the precise location and areal extent of these occurrences. The ecosystem descriptions included are from the BC Ministry of Environments "Saving Sensitive Ecosystems" publication.

Sensitive Ecosystems (SEI) from CDC:

1. Older Forest

Older Forest is defined as conifer-dominated forest with an average tree age of 100 years or greater. The trees are generally large and tall, reaching up to 1.5m in diameter and over 50m in height. With greatest representation in the southern coastal lowlands, Older Forests comprise only 2.6% of the entire SEI study area, and 33% of the total area sensitive ecosystems.

2. Older Second Growth Forest

Older Second Growth Forests are the most common forested ecosystem in the SEI study area. They function as both essential habitat areas for many wildlife species, and as primary connections between ecosystems in the highly fragmented landscape of the Georgia Basin. All Second Growth Forests have been disturbed by logging or other human disturbance since the settlement of Vancouver Island and the Gulf Islands began in the middle of the 19th century.

CDC Confirmed Rare Community:

- Douglas-fir/Dull Oregon Grape: S2 Red (2010)

3. Woodland

Woodlands are open forested areas comprised of pure stands of Garry Oak and mixed stands of Douglas-fir/Garry Oak and Douglas-fir/Arbutus. Their understorey is characterized by a rich mosaic of wildflowers, grasses, shrubs and mosses. With greatest representation in the Gulf Islands and southeast coast of Vancouver Island, Woodlands occur as widely scattered fragments comprising only 0.6% of the entire SEI study area, and 7.8% of the total area sensitive ecosystems by areas.
Rare Communities Present:

- Garry Oak/Oceanspray: S1 Red (2004)
- Garry Oak/Big-leaf Maple/Cherry: S1 Red (2004)
- Douglas-fir/Arbutus: S2 Red (2004)

4. Coastal Bluffs

Coastal bluff ecosystems include rocky shorelines, rocky islets and steep coastal cliffs with grasses, forbs (low, broad-leaved plants), mosses and lichens. Coastal bluffs are similar to the terrestrial herbaceous ecosystems found inland, but distinctive because of the prevailing influence of salt spray. Coastal bluff ecosystems are naturally rare in this area; undisturbed sites are very rare. Coastal bluffs occupy less than 0.3% (1,043 ha) of east Vancouver Island and Gulf Islands. Even rarer are coastal cliffs, represented in less than 0.03% of this area.

Rare Communities Present:

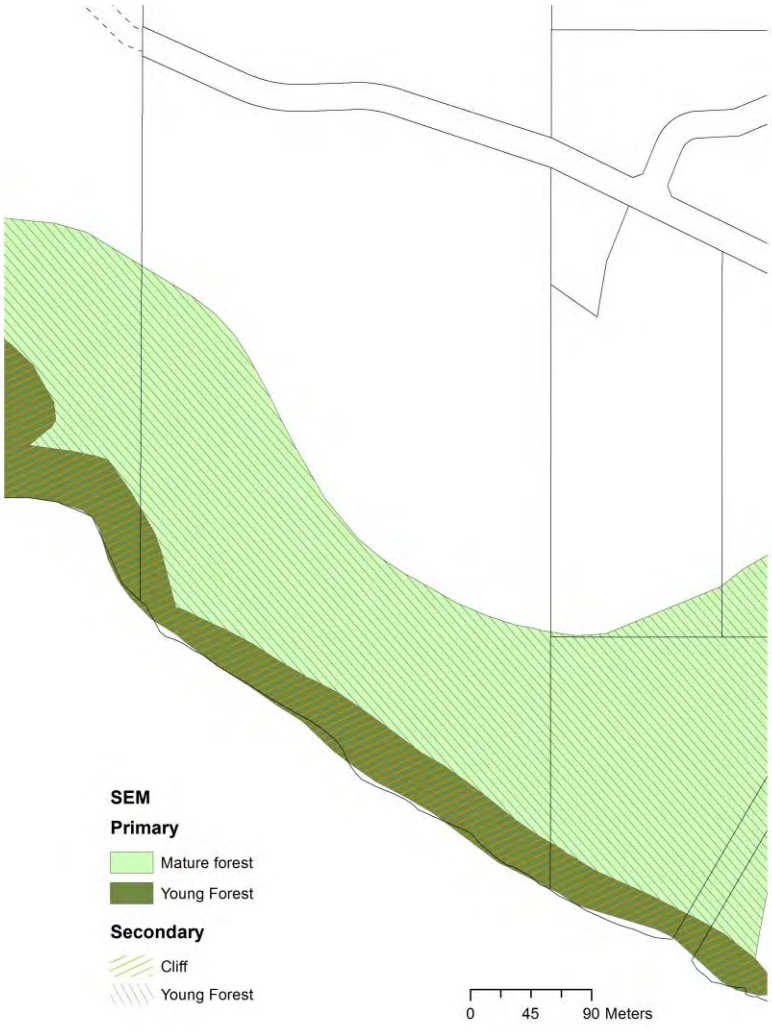
- Arbutus/Hairy Manzanita: S2 Red (2004)
- Garry Oak/Arbutus: S1 Red (2004)

Figure 8 highlights the sensitive ecosystems found on TNS as identified by the ITF Sensitive Ecosystem Mapping. This mapping product is an updated version of the Sensitive Ecosystems Inventory to locate, identify and map sensitive ecosystems in order to protect these areas. Intense development pressure fueled by population and economic growth has fragmented and degraded many terrestrial ecosystems in the Gulf Islands. A high proportion of these ecosystems are now designated as 'at risk' in BC. These sensitive ecosystems typically are rare, have high biological diversity and are a vital part of the landscape threatened by development.

A sensitive ecosystem that is found in the Santuary is a cliff ecosystem. Cliff ecosystems (seen in red hatch in conjunction with the Young forest in Figure 8) are steep slopes, often with exposed bedrock. Very little soil accumulates in these ecosystems and only exceptionally hardy trees and plants maintain a precarious grip. Coastal cliffs, such as the one located in TNS, occur near shorelines with powerful wind, heat and wave influences. Cliff ledges and fissures offer isolated habitat protected from predators, making cliffs choice nesting sites for a variety of birds. Crevices are used by roosting bats, while deeper crevices serve as shelter and overwintering areas for snakes and lizards. Cliffs contribute to the scenic beauty of the Islands Trust Area, attracting visitors and boaters who may contribute to local economies. Cliffs also offer spectacular waterfront views, creating

recreational opportunities on land, often leading to their degradation by development, trails and introduced species.

**Figure 8. TNS Sensitive Ecosystem Mapping (based on 2009 Air photo)**




Mature forest ecosystems are also identified as sensitive. They are conifer-dominated dry to moist forest stands, usually 80 to 250 years old. Some stands may include deciduous tree species making up 25% of the canopy cover. The biodiversity values of the mature forest ecosystem type increases with age, meaning that a forest will be able to sustain a greater variety and number of plants and animals as time progresses. In addition, mature forest stands serve as buffers and corridors between different sensitive ecosystems, protect micro-habitats, and allow forest dwelling species to move freely and safely between the various habitats. They also play an important role in the capture and storage of carbon dioxide and the fight against climate change.

#### 3.5.1.3 CDC Rare Element (Plant) Occurrences

Rare and endangered species in British Columbia are designated as either red or blue-listed. The Red List includes any indigenous species or subspecies considered to be extirpated, endangered, or threatened in BC and the Blue List includes any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. None of the plant species observed during the 2001 CDC site visits was listed at that time as rare or threatened, however in 2013, Harford's Melic Grass was ranked as a species of special concern and added to the Blue list (S3). Given the continual updates to the CDC inventory listings, further inventory is recommended over time.

### 3.5.2 Wildlife and Wildlife Habitat

#### 3.5.2.1 Wildlife Features

The following features characterize the Sanctuary with respect to wildlife habitat and use:

- Douglas-fir trees and the coastal bluffs are utilized by Peregrine Falcons and Bald Eagles as perch and nesting sites;
- Evidence of Mule (Black-tailed) Deer (droppings, trails, and browsing) exists;
- TNS forms part of a defacto wildlife corridor running the length of the southern edge of the island;
- Presence of wildlife trees with evidence of woodpecker activity;
- Open meadow and slash piles created by previous timber harvesting provides habitat for a variety of songbirds; and
- Presence of seabird colonies on bluffs.

#### 3.5.2.2 Birds

The following provincially-listed birds were identified on the Sanctuary during site visits:

- Anatum Peregrine Falcon (*Falco peregrinus anatum*) – Red-listed (S2B/2010)
- Double-Crested Cormorants (*Phalacrocorax auritus)* – Blue-listed (S3B/2005)[3]

[3] Down-listed from Red in 2005

- Olive-sided Flycatcher (*Nuttallornis borealis)* – Blue-listed *(*S3S4B/2009)[4]

The variation in ecosystems within the property (bluffs, forest, meadow) provide excellent habitat for a variety of bird species. A list of birds species identified during the site visits for both the management plan and the 1999 baseline report is presented in Appendix 1, Table 2). The Coastal Bluffs, adjacent Woodlands and the Older Forest have high habitat values for a variety of birds.

Pelagic Cormorants (*Phalacrocorax pelagicus*), a yellow-listed species, also use the bluffs to nest in the Sanctuary. Though they are not listed as a species of concern in BC, a continuing decline in nest survey counts may indicate the need to re-assess the level of risk this species is at in the near future.

**Bald Eagles**

An active Bald Eagle nest was observed by the Sanctuary Warden in 2010, and one fledgling was observed. Activity was also noted during covenant monitoring in 2010 and 2012 (HAT Monitoring Reports 2010, 2012).

**Peregrine Falcons**

The Ministry of Environment has been conducting provincial Peregrine Falcon surveys on the Southern Gulf Islands every five years since 1970, beginning in 1980. The 2010 provincial Peregrine Falcon survey results represented the highest totals on record for both subspecies in British Columbia (Chutter 2011).

The Peregrine Falcon (*Falco peregrinus anatum*) nest site near the bluffs has been surveyed by the Ministry of Environment since 1980. There are two active eyries which are known to be alternate nesting sites for a single pair (Doyle 2010).

The Peregrine Falcon nest site was observed in February 2001 (Chatwin 2001). Although an active nest site was not seen on either management plan site visit in June or July 2001, the Falcons were heard on both occasions and observed on one.

The Peregrine Falcons found on the Galiano Bluffs (TNS) were thought to be the Anatum subspecies. However limited genetic testing over the last decade may indicate that the Southern Vancouver Island and the Gulf

[4] Upgraded to Blue list 2009

Islands Peregrine Falcons are a hybrid of the Anatum and Peale's subspecies (Chutter 2011).

The 5-year survey results for the Peregrine Falcon nesting sites are listed in the table below (Doyle 2010):

| Date | Observation |
|---|---|
| 2000 | Active/No Young Observed |
| 2003* | With young |
| 2005 | Pair defending nest |
| 2010 | With young |

**Table 1. Peregrine Falcon Nest Survey Results**

* supplemental survey

**Double-crested and Pelagic Cormorants**

The Ministry of Forests, Lands and Natural Resource Operations has been conducting regular cormorant nest count surveys at the Trincomali bluff site since 2000. At that time, 14 nests, 25 Double-crested Cormorants (DC) and six young were observed. A site visit conducted June 14, 2001 resulted in a count of approximately 20 nests and 40 adult DC Cormorants. This remained consistent one month later at the time of the TNS charette (Chatwin 2001). See table below for a section of the historic survey counts. A complete table can be found in Appendix 1, Table 4.

| **Cormorant Nest Counts 2000-2012, Galiano Island Cliffs Nesting Colony[5], Trudy Chatwin.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **2000** | **2001** | **2006** | **2007** | **2008** | **2009** | **2010** | **2012** |
| **Pelagic** | 11 | 70 | 0 | 48 | No survey | 39 | No survey | No survey |
| **D-crested** | 14 | n/a | 28 | 90 | No survey | 47 | No survey | No survey |

**Table 2. Summary of Cormorant Nest Counts 2000-2012**

The DC colony may be one of the most successful colonies in the Strait of Georgia as it was one of only two locations where young were seen during the 2000 annual site visits. It appears that these cormorants may have moved to the TNS site when they abandoned their colony on the Balingall Islets in Trincomali Channel. They may have moved to avoid disturbance from Bald Eagles (Chatwin 2000).

[5] Extracted from the Historic Record of Cormorant Nest Surveys in the Strait of Georgia (Ministry of Forest, Land and Natural Resource Operations)

Chatwin stated that this site is becoming of increasing significance in the Strait of Georgia given that the number of DC Cormorant nests has increased over the previous year. It is Chatwin's opinion that the DC Cormorants are successful in this location because their nests are inaccessible to Bald Eagles. On the other hand, surveys counts for the Pelagic Cormorants have shown a slow decline over the past 10 years. Perhaps the results of these surveys are indicating that Pelagic Cormorants should be upgraded to a blue-listed species ranking. (pers. comm., Chatwin).

**Other bird species**

During the June 2000 cormorant survey Chatwin also observed three Glaucous-winged Gull nests. This number remained relatively stable one year later. In 2000, Chatwin noted six Pigeon Guillemots while one year later approximately 50 were observed.

3.5.2.3 Other Vertebrates

Common vertebrates observed on the Sanctuary are: Black-tailed Deer (Odocoileus hemionus columbianus), Douglas' Squirrel (Tamiasciurus douglasii), and Garter Snakes (Thamnophis spp.). Although not included in the terrestrial boundary of the TNS, American Mink and Northern River Otter have been observed in the waters below the coastal bluffs and likely use the shoreline as habitat for denning and feeding grounds.

The Coastal Bluffs along much of Galiano Island, including the Sanctuary, have been identified as potential suitable habitat for the Federally & Provincially Endangered Sharp-tailed Snake. Collaborating with local herpetologists in the region to survey for this rare snake in the Sanctuary would be highly beneficial to enhancing the knowledge base for the ecology of this species on the Southern Gulf Islands.

3.5.2.4 Invertebrates

The consulting team observed several butterfly (including the Anise swallowtail) and dragonfly species in the recently logged area of the property during the 2001 site visit to the Sanctuary.

### 3.5.3 Fish and Fish Habitat

There are no waterbodies found in TNS, therefore, there is no fish habitat within the Sanctuary. However, below the Coastal Bluffs, there may be an abundance of small fish attracted by the nutrient-rich water (caused by guano produced by the bird colony).

# 4.0 Management Plan

Management plans are used to provide long-term direction and guidance for the management of values and features of significance on properties owned by the Trust Fund Board. Management issues and strategies for the TNS were identified and developed by:

- conducting site visits;
- communication with relevant experts;
- conducting an on-site stakeholder charette; and
- reviewing literature.

It is the policy of the ITF to develop a management plan for its properties and then work with a Management Group to implement the plan.

Section 4.1 identifies and discusses management initiatives while section 4.2 outlines management strategies to address priorities and guide the short and long-term management of the sanctuary. Action Items that were set up for the 2002 Management Plan were reviewed and updated in 2013. The review and the current action items are discussed in Section 5 of this report.

## 4.1 Management Initiatives

The management initiatives that were identified for the Sanctuary are listed in the table below (not in order of priority):

| | |
|---|---|
| 4.1.1 Coastal Bluff & Woodland Ecosystems | 4.1.8 Recreational Use |
| 4.1.2 Falcons and Cormorants | 4.1.9 Signage |
| 4.1.3 Older Forest Ecosystem | 4.1.10 Zoning |
| 4.1.4 Recently Logged Area ($2^{nd}$-growth) | 4.1.11 Monitoring Program |
| 4.1.5 Sharp-tailed Snake Habitat | 4.1.12 Non-indigenous vegetation |
| 4.1.6 Logging Slash Piles | 4.1.13 Fire Management |
| 4.1.7 Natural Spring | 4.1.14 Research |

**Table 3. Management Initiatives for the Sanctuary**

### 4.1.1 Coastal Bluff and Woodland Ecosystems

Because of their general rarity, all Coastal Bluffs are of conservation concern in the Sensitive Ecosystem Inventory study area (McPhee et al. 2000). Therefore, special care must be applied to the management of this section of the property. Direct and indirect impacts must be avoided. The Older Forest and Woodlands at the top of the cliffs act as an important buffer to many of the plants and wildlife that make use of the Coastal Bluff habitat.

Plants can be easily trampled or dislodged by human foot traffic (McPhee et al. 2000) in Coastal Bluff ecosystems. A footpath currently exists atop the bluffs. Apparently, only those residents on the island who are aware of its existence use this path. The current level of use appears quite low since vegetation along the trail continues to show little sign of trampling.

**Photo 4. Coastal Bluffs from eastern boundary line**

A small stand of Hairy Manzanita (*Arctostaphylos columbiana*) was observed in 2001 in the upper portion of the bluffs. It is unusual for a stand to exist in such a location as Hairy Manzanita usually occurs along Galiano's central interior ridge, which has a dry southwest exposure (Baseline Report 2000). The series of harsh winters (pre-2001) had been hard for Manzanita and have prevented the plant from reaching its resting stage. As a result, even a slight drop in temperature could cause detrimental physiological changes. Adolf Ceska, with the CDC,

recommended that nothing be done other than allowing nature to take its course and he suggested the plant may naturally come back. The stand was reported to be in poor health in 2001 and in 2009, Odin Scholz stated in the TNS Restoration Plan that the Hairy Manzanita population had died out (Scholz 2009).

On a positive note, during the 2012 management visit, HAT staff observed a single Hairy Manzanita shrub on the bluffs in good condition. It would be beneficial to do a more thorough survey in the near future to determine if the species is making a come-back.

### 4.1.2 Falcons and Cormorants

The consulting team observed a Peregrine Falcon on July 12, 2001, and identified it as subspecies Anatum. This subspecies may have been introduced into the region some 40 to 60 years ago. Regardless, their endurance in the area makes them a part of the ecosystem. This, coupled with their rarity according to the B.C. Conservation Data Centre ranking as a red-listed species, requires that special attention be paid to these birds and their habitat particularly during the breeding and nesting season, which runs from March to August.

Falcons nesting in the wild tend to be relatively intolerant of human encroachment in their territories (Cade et al. 1996). Peregrines become excited and may become aggressive when humans approach their nest, particularly if young are present. Aggressive birds may dive within a metre of intruders, screaming a high-pitched *cack-cack-cack*. Because calls often become more intense the nearer one gets to the nest, the peregrine may unknowingly aid rather than intimidate a nest seeker (CWS 2001). One Peregrine Falcon was heard during the two site visits and observed on one. In both instances, the falcon gave the impression of being disturbed by the human presence. Doyle suggested that the falcon's persistent "cacking" on the occasion of our site visit may indicate that the falcons were successful this year in terms of producing offspring. In addition to hearing and observing falcons, the consulting team discovered the remains of three recent kills (two appeared to be kingfishers and the third a thrush) that were attributed to the Falcon. In addition, a Pigeon Guillemot wing was discovered during the 2012 management site visit, also likely the remains of a kill.

It should be noted that in 2001, the Sanctuary Warden at the time observed a helicopter flying within close proximity distances of the

falcons. It was discovered that this activity was for research purposes undertaken by the Ministry. Research is discussed in Section 4.1.14.

The Double-Crested and Pelagic Cormorants nest in the ledges of the bluff face. The white wash or guano on the bluffs makes the site highly visible from the water and in air photos. This could be of concern during the high recreational boating season. Thus far, boaters have not been observed flushing the birds from their nest. The consulting team used a method of observation involving viewing the birds from an idling zodiac approximately 50 metres from the bluffs. The birds did not appear to be disturbed by the presence of the boat at this distance.

In August 2001, Chatwin performed an ad hoc "disturbance test" at this site. From a research boat, she observed that the DC Cormorants reside at the higher elevations of the bluffs while the Pelagic Cormorants nest lower down. She stated that the research boat she was in was probably within 30m of the cliffs and the birds did not appear disturbed. She estimated that their boat came as close as 10m from the cliffs at which point the birds began to stretch their necks in reaction to the observers. The Pelagic Cormorants reacted more noticeably than the DC Cormorants given their respective locations on the bluffs. However, Booth (2001) cites a minimum set-back distance for DC Cormorant viewing of 75m. The previous Sanctuary Warden noted occasions when aircraft landing in the vicinity have flushed the birds from their nests.

In 2011, after conducting over 500 such tests, Chatwin authored a report called "Seabird Viewing Guidelines: How Close is Close Enough?" In her report, she found that at distances less than 40m, there was a chance of disturbing both species of nesting cormorants. At 50m, the chance of agitation was reduced to zero for all species except Pelagic Cormorants.

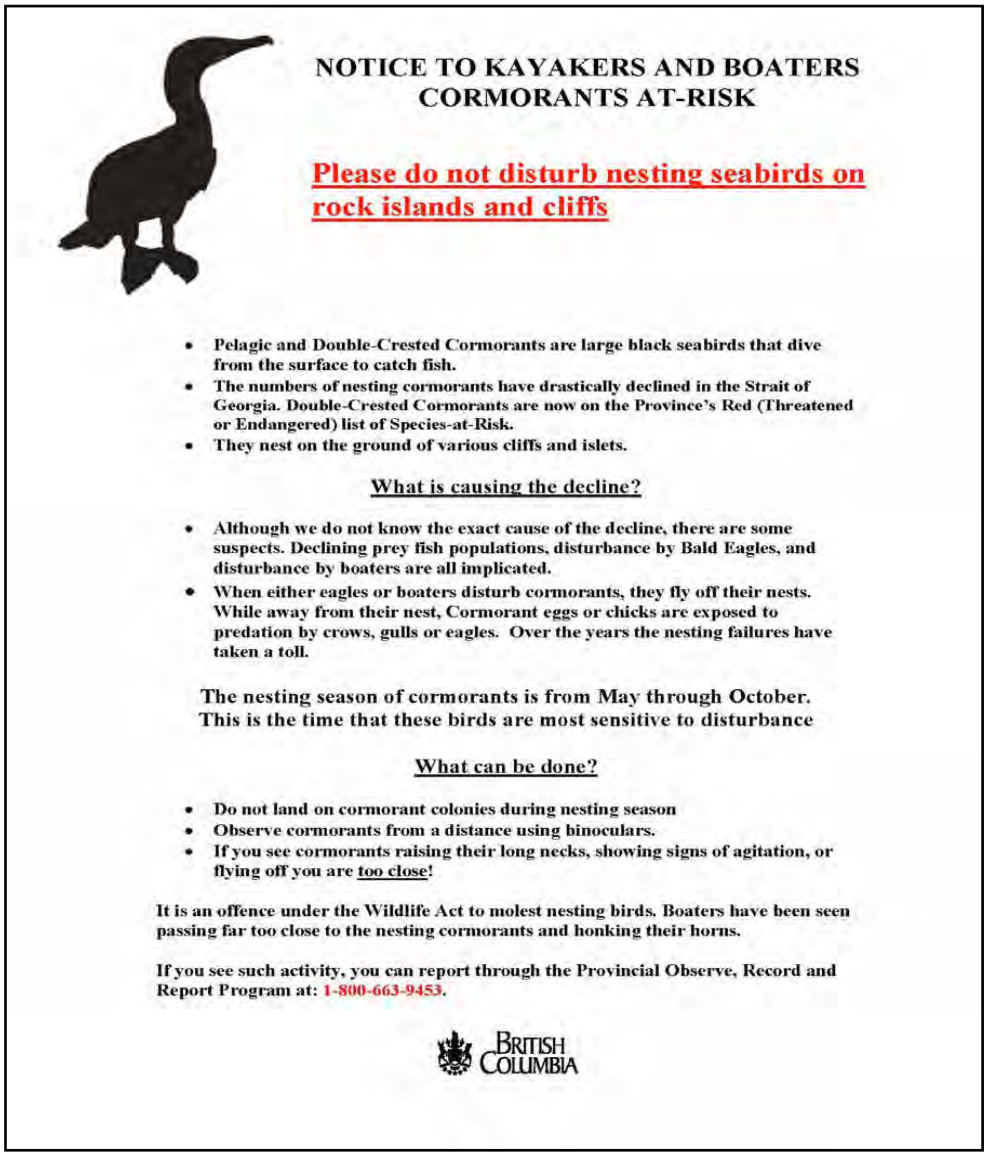
This research also demonstrated that a single kayak could approach nesting and roosting sites with less agitation response than a motorboat, however, kayakers most often travel in groups and travel closer along the shoreline, in addition to approaching and landing on otherwise inaccessible shorelines. Chatwin goes on to recommend that kayakers should approach seabird nesting and roosting sites in a tangential manner, and paddle parallel to the shore at the prescribed distance.

The recommendation set out by Chatwin's report states that a general single set-back distance based on motorboat thresholds of 50m should be adhered to by all boat and kayak traffic. This distance would ensure that nesting seabird species were protecting on the Vancouver Island and

the Southern Gulf Islands. Effective management techniques could include marking set-backs with buoys and educational posters and interpretative signage that aid the public in recognizing sensitive seabird species and signs of agitation (Chatwin 2011).

The Woodlands and Older Forest adjacent to the Coastal Bluffs is closed to the public and to all human presence during the nesting season to ensure an adequate buffer to the bluff environment and the major bird habitat. Signs have been posted in those areas that lead to the southern section of the property. Any footpaths or trails leading from the recently logged area of the property to the closed section should also be physically blocked off, preferably with berry producing shrubs which will also enhance song bird habitat.

**Figure 9. Cormorant Educational Sign for Boaters & Kayakers**




The Islands Trust has no authority to regulate boating traffic on the water; however, education at strategic marine harbours is of great benefit in preventing disturbance to the seabird colonies of TNS. Habitat Acquisition Trust initially provided educational signs to the Sanctuary Wardens which were posted at Montague Harbour; however, the posters have since been removed. During the 2012 management visit, the owner of the Harbour suggested placing them on the docks proper, as well as the activity posting board. The Management Group will erect the Ministry of Environment poster shown in Figure 8 at appropriate locations during the 2013 annual monitoring visit.

According to the Shoreline and Marine Advocacy Resource Policy of the 1995 Galiano Island Official Community Plan, "The Ministry of Forests, Lands and Natural Resource Operations, the Ministry of Agriculture and Fisheries and Oceans Canada shall be requested to encourage protection of bird habitat in shoreline areas" (Galiano Island 1995 OCP, amended 2011 p.39). As mentioned previously, there has been an effort to research and enhance public education regarding guidelines for viewing sensitive wildlife. In addition to the provincial seabird viewing guidelines published in 2012 by Chatwin; Fisheries and Oceans Canada has developed "Be Whale Wise - Marine Wildlife Guidelines for Boaters, Paddlers and Viewers" which contains guidelines for seabirds and nesting colonies.[6] Perhaps most effective in protecting seabird populations will be the designation of a National Marine Conservation Area (NMCA) in the Salish Seas. In 2011, the governments of Canada and BC announce their commitment to proceeding with a NMCA. Currently, Parks Canada is consulting with First Nations, local governments, and stakeholders to gain input that will inform a decision on the feasibility of the proposed NMCA.

Relationships and collaboration should be maintained with each of these agencies (Local Trust Committee, ministries and federal departments) for the purpose of ensuring that these guidelines and federal marine/shoreline policies are enforced and that public awareness remains a priority.

[6] http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/mammals-mammiferes/view-observer-eng.htm

### 4.1.3 Older Forest Ecosystem

This area of the property is a forest that was high graded in the early 1900's and is therefore a forest in recovery. This forest has already begun to take on older-growth attributes with a discernible increase in course woody debris and understory vegetation. This Older Forest ecosystem serves as an important buffer to the Coastal Bluff ecosystem.

**Photo 5. Older Forest at Trincomali Nature Sanctuary**

As stated with respect to the management of the Coastal Bluffs and bird species, it is recommended that this portion of the property be blocked off to the public. This will prevent hikers from reaching the southern portion of the Sanctuary protecting, not only the nesting seabirds, but also the sensitive Coastal Bluffs and Woodland ecosystems.

### 4.1.4 Recently Logged Area (Older Second Growth Forest Ecosystem)

This management plan recommends that the recently logged area of the property be primarily left to natural succession processes. Major restoration activity is not necessary as natural regeneration is progressing well, with an abundance of sapling tree species such as Douglas-fir, Grand Fir and Redcedar filling in along the old logging road. However, evidence of deer browse on these young saplings is aggressive, and placing protective fencing around the saplings would be beneficial to enhancing natural succession. Planting hardy shrub species in the areas opened up by Broom removal efforts and in strategic areas to block access to the southern portion of the Sanctuary would also be beneficial. In addition, continued removal of invasive species will be necessary over the long-term. Supplemental planting should be done with the approval

of ITF and the Management Group, use native vegetation, and shall be in harmony with the goals of the management plan.

Over time (60-100 years), this area will begin to take on more mature forest attributes (snags, downed logs and other structural elements). Old-growth attributes (larger snags, coarse woody debris, fully developed moss layer and mixed age classes) will begin to occur after 100 years.

### 4.1.5 Sharp-tailed Snake

The Sharp-tailed Snake (STS) is a small, elusive indigenous snake that is provincially red-listed in BC. Only about 30 cm long, adult STS's don't bask out in the open; they seek warm spots under rocks, logs or pieces of bark, and human objects such as roofing shingles. Their small size and secretive nature makes them difficult to observe and research. There is little known about the biology of this species, such as daily and seasonal movement patterns, critical habitat, diet, egg laying and time of hatching. Sharp-tailed Snakes are usually found on south-facing rocky slopes of Garry Oak and drier Coastal Douglas-fir ecosystems. With the TNS identified as having potential suitable habitat, it would be an excellent opportunity to conduct studies on Sharp-tailed Snakes here.

The Management Group will collaborate with ITF and local herpetologists to determine the best methods to survey for the species and if STS is present at the Sanctuary, to develop a management plan to monitor its progress.

### 4.1.6 Slash Piles

The slash piles remaining from the recent (2000) logging activity were thought to present the threat of fire and/or breeding of pests. The 2002 consulting team, and later biologist O. Scholz, recommended that the

**Photo 6. Slash Pile in Recently Logged Area**

removal and dispersal of the slash piles be a high priority action item (Scholz 2009). The feasibility of achieving this action item would be quite a costly and invasive procedure due to the necessity of heavy-duty equipment, manual labour and the time it would require to disperse these massive piles of heavy stems, trunks and root balls that are overgrown with vegetation.

In the 2013 questionnaire submitted to Tom Darby, Fire Chief for the North Galiano Volunteer Fire Department, The Management Group inquired as to the necessity for the removal or dispersal of the slash piles to reduce fire hazard potential. Mr. Darby rated the removal or dispersal of these piles as low to unnecessary within the next 10 years. A copy of the questionnaire can be found in Appendix 2, Figure 1.

The current recommendation is to allow the slash piles to remain as they are and to decompose naturally. They are currently providing excellent bird and small mammal habitat, and do not appear to pose a significant fire hazard or pest breeding potential to warrant an aggressive dispersal or removal effort at this time. The Management Group recommends

monitoring the piles, and re-evaluating the situation if a further threat is identified in the future.

### 4.1.7 Natural Spring

The natural spring located adjacent to Porlier Pass Road is a source of water for an adjacent wetland (north of the Sanctuary). As stated earlier, wetlands are an ecosystem of conservation concern (McPhee et al. 1998). William Hodge, Groundwater Hydrologist with the Ministry of Water, Land and Air Protection, suggested that the spring is significant for the wetland but also because wetlands typically recharge downstream wells.

The spring and associated vegetation occur immediately adjacent to Porlier Pass Road. Norm Bennett with the Ministry of Transportation states that roadside ditches are cleaned on a 7-year cycle. Any material and sediment collected from the ditch are carried away for disposal. Therefore, there does not appear to be any threat of sealing the spring. Hodge hypothesized that the ditching could possibly aid the flow of water to the adjacent wetland.

### 4.1.8 Recreational Use

This property is protected as a nature sanctuary, containing critical habitat and wildlife use that is vulnerable to human disturbance. Public use of the sanctuary should not be encouraged in light of the sensitive ecosystems and wildlife.

What this means is that day use (hiking, bird watching, dog walking) within the recently logged area along the old logging skid road will be permitted. These activities will not be promoted however. The lack of parking should naturally limit the amount of day use that occurs. Overnight camping and campfires will not be permitted.

From discussions with Derek Astbury, the first Sanctuary Warden, and from site visit observations, it is apparent that TNS gets very little use; however, a few local residents use the logged area frequently with their dogs.

Within the Older Forest/Coastal Bluff/Woodland portion, the only use permitted is monitoring and implementation of management plan recommendations, e.g., removal of invasive species. Therefore, the existing access to this area should be closed off with the planting of native vegetation.

### 4.1.9 Signage

As per section 4.1.8, public use within the recently logged area will be permitted but not encouraged. Signage is necessary to ensure that the Coastal Bluff/Woodland and Older Forest ecosystems, which are sensitive ecosystems and serve as crucial habitat for endangered seabirds and as a buffer to their habitat, remain closed to public.

At the time of the 2002 Management Plan report, there were only two signs posted on the property: one located at the base of the coastal bluffs and the other at the end of the logging road spur at the border of the logged portion. Both signs were created by The Land Conservancy and read "Important Nesting Area –Stay Clear".

As recommended in the 2002 Management Plan, three new signs were erected within the Sanctuary in 2012. Two were placed along the hiking loop trail in the recently logged area. These signs read "This property protects critical habitat and wildlife that are sensitive to human disturbance. Please help by staying on the trail" and have symbols representing no fires, hunting or camping, in addition to ITF, HAT and TLC logos. A third sign was placed at the intersection of the loop trail and the trail to adjoining property to the east, which continues on through the Older Forest to the bluffs. This sign reads "Closed Area – Bird Nesting Habitat – Human presence is known to be very disruptive during nesting season", again recognizing all partnering agencies. The sign at the end of the spur trail at the border of the Older Forest remains, however, it is no longer supported by posts, and rests against a tree (Appendix 3, Photo Group 2010-2013).

**Figure 10. Signs Posted at Sanctuary - 2012**



As of March 2013, the TLC sign located at the bottom of the bluffs is no longer there (pers. comm. C. Black). This is likely a benefit to the nesting colonies. The previous sign was so small; it was actually encouraging boaters and kayakers to approach the shoreline closer in order to read the warning on the sign, which read to "Stay Away". The ITF and Management Group should consider placing buoys at 50 metres from the shoreline with signs on them that alert boaters and kayakers to the threat of human disturbance to the nesting cormorants and the marine protection zone.

In accordance with the *Trespass Act*, "No Trespassing" signs should be posted at all entry points to the property to indicate that the property is private and also cover any liability issues. The primary public access point to the Sanctuary is the entrance off Porlier Pass Road. There has been a hand-made sign posted here by an unknown person attached to the Cedar tree that used to have the chain-gate attached. This appears to be a suitable way to discourage entrance, as it looks like a privately-owned property sign (See Appendix 3, 2010-2013 photos).

A new potential entry point is the large parcel to the west of the Sanctuary (DL 57). This parcel was purchased in 2012 by the Galiano Conservancy Association (GCA), who is planning to use the land as a nature centre for youth. There is a fence running the entire length

between the two parcels, which should provide an obvious boundary-line to alleviate unintentional entrance into the Sanctuary. However, the Management Group and ITF should work collaboratively with GCA to ensure that communication is ongoing to encourage support for both the protection of the sensitive ecosystems and species on the Sanctuary and GCA's nature centre goals for the education of youth.

The remaining entrance points are through private properties, one of which is the current Sanctuary Warden's property, and are not open to the general public. Ongoing open communication with adjacent neighbours would be more appropriate than "no trespassing signs" in these situations.

In general, it would be beneficial for the Wardens to be on the alert to any significant increases or changes in park usage and for them to notify the Management Group or ITF if necessary.

4.1.10 Zoning

At the time of acquisition, the property was designated as Forest land. It is the policy of ITF to request a change to the designation and zoning the next time the OCP and/or Land Use Bylaws are being amended if the current designations are not appropriate. The 2002 Management Plan recommended that the land use designation be changed from Forest to Nature Protection to more accurately reflect the intent of the Islands Trust Fund sanctuaries.

In 2004, the Land Use Bylaw was amended and the request for re-zoning was accepted. The parcel was re-zoned to Nature Protection.

The listed objectives in the OCP[7] for Nature Protection zoning are:

Permitted Uses:

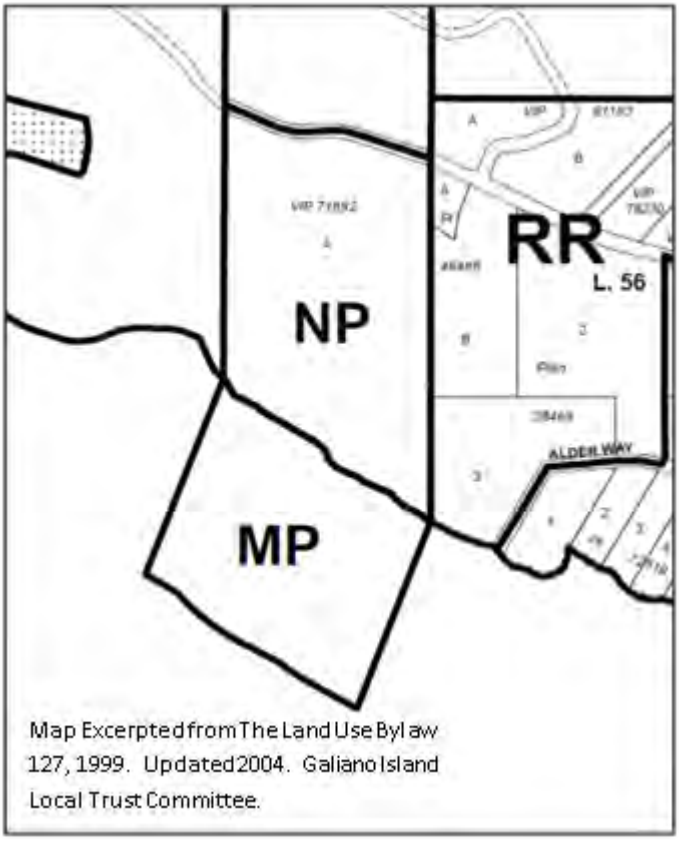
- Ecological reserves and nature conservancies;
- Research and educational activities; and
- Groundwater retention and recharge.

Buildings and Structures:

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

[7] The Land Use Bylaw 127, 1999. Galiano Island Local Trust Committee. Consolidated June 15, 2001.

**Figure 11. New Zoning Designation Map**




The Local Trust Committee has the ability to zone the surface of the ocean within the local trust area; it was recommended that the ITF request Marine Protection status off the Sanctuary as a buffer to the Coastal Bluffs and associated seabird colonies. The marine area adjacent to the Sanctuary was designated as a Marine Protection Zone in 2004.

Permitted uses in Marine Protection Zones:

- Marine Navigational aids

Prohibited uses in Marine Protection Zones:

- No buildings or structures are permitted
- The residential use of a watercraft of any kind, whether temporary or permanent, is prohibited.

The establishment of the Nature Sanctuary meets these objectives and will maintain the values identified in the OCP.

### 4.1.11 Monitoring Program

The best time to monitor the Sanctuary was determined by the biological processes of the Peregrine Falcons. Doyle indicated that if the falcons successfully nest, they would be incubating their eggs in April/May. Juveniles would appear around June/July and should be flying by mid to late July. These timetables can vary by a month however. To prevent disturbance to the Peregrine Falcons, effective monitoring was recommended to be conducted between September 1st and March 1st. Unfortunately, this time frame does not coincide with the best time to observe and monitor vegetation.

As noted earlier, the cormorants, particularly the Pelagic species, appear to be somewhat susceptible to disturbance as well and may find the annual monitoring visits stressful. Given the above needs and constraints, monitoring was recommended to take place between September and October. The rationale for this is simply to err on the cautious side and avoid potential disturbance to the nesting and rearing needs of the falcons and cormorants as this is of priority in the TNS.

Annual site visits are conducted by ITF to monitor the condition of the TNS. The Sanctuary is also monitored annually in the late fall or early winter by the Covenant Holder/ Management Group, Habitat Acquisition Trust. Criteria to be addressed during monitoring events are:

1. Indications of public use;
2. Status of bird species of concern (number of nests/individuals);
3. Condition of former logging road and extent of regeneration throughout the logged portion;
4. Non-native species invasion
5. Condition of the Older Forest, Coastal Bluff and Woodland ecosystems; and
6. Condition of the natural spring and health of associated vegetation.

### 4.1.12 Non-indigenous Vegetation

In 2001, when the property was acquired, there was only one batch of Scotch Broom observed and reported as establishing a foothold on the bluffs above Trincomali Channel. The consulting team advised that this non-indigenous shrub should be removed from the property so as to prevent its spread.

In less than a decade, this species has spread throughout the Sanctuary establishing a major foothold along the Coastal Bluffs, Woodlands and the recently logged area of the Sanctuary. In addition, Cutleaf Blackberry and English Holly have also established. These three invasive species have become the primary targets for eradication during recent restoration efforts.

**Photo 7. Volunteer removing Evergreen Ivy at Sanctuary - 2011**

Management Activities

In 2009, Odin Scholz was contracted by ITF to create a Restoration Report for Trincomali Nature Sanctuary. This report mapped and identified priority restoration efforts to control and dispose of the Scotch Broom from the Sanctuary. In 2010, Scholz did a significant Broom removal project along the bluffs of the Sanctuary. His report identifies future target areas for restoration, and methods used during his project (Scholz 2009, 2010).

In 2011, HAT began doing invasive species removal in the recently logged area. The entire area was initially surveyed for all invasive plant species and recorded by GPS. From this data, a map and long-term eradication plan and was established. During the following two invasive species events, all of the English Holly and most of the non-native Blackberry populations were eradicated from the Sanctuary. A tremendous amount

of Scotch Broom was removed as well with over 60 hours of removal efforts. The Scotch Broom has now been consolidated into three sections of the recently logged area, with all of the isolated populations cleared of Broom (HAT Restoration Report 2011, 2012).

The recently logged area exhibits numerous other invasive species (e.g. thistles and grasses) none of which were deemed to be significant threats to the recovery of the area at this time. However, the current Management Group recommends adding three new species to the priority removal list: Foxglove (*Digitalis purpurea*), Tansy Ragwort (*Senecio jacobaea*) and Rose Campion (*Lychnis coronaria*) while these invasive plant species are still manageable to eradicate. An additional species of concern to prioritize for removal is Orchard Grass (*Dactylis glomerata*). This introduced grass has become the number one species to target for eradication in Garry Oak and associated ecosystems by the Garry Oak Ecosystems Recovery Team (GOERT 2007).

**Figure 12. Restoration Map 2011 & 2012 Activities**

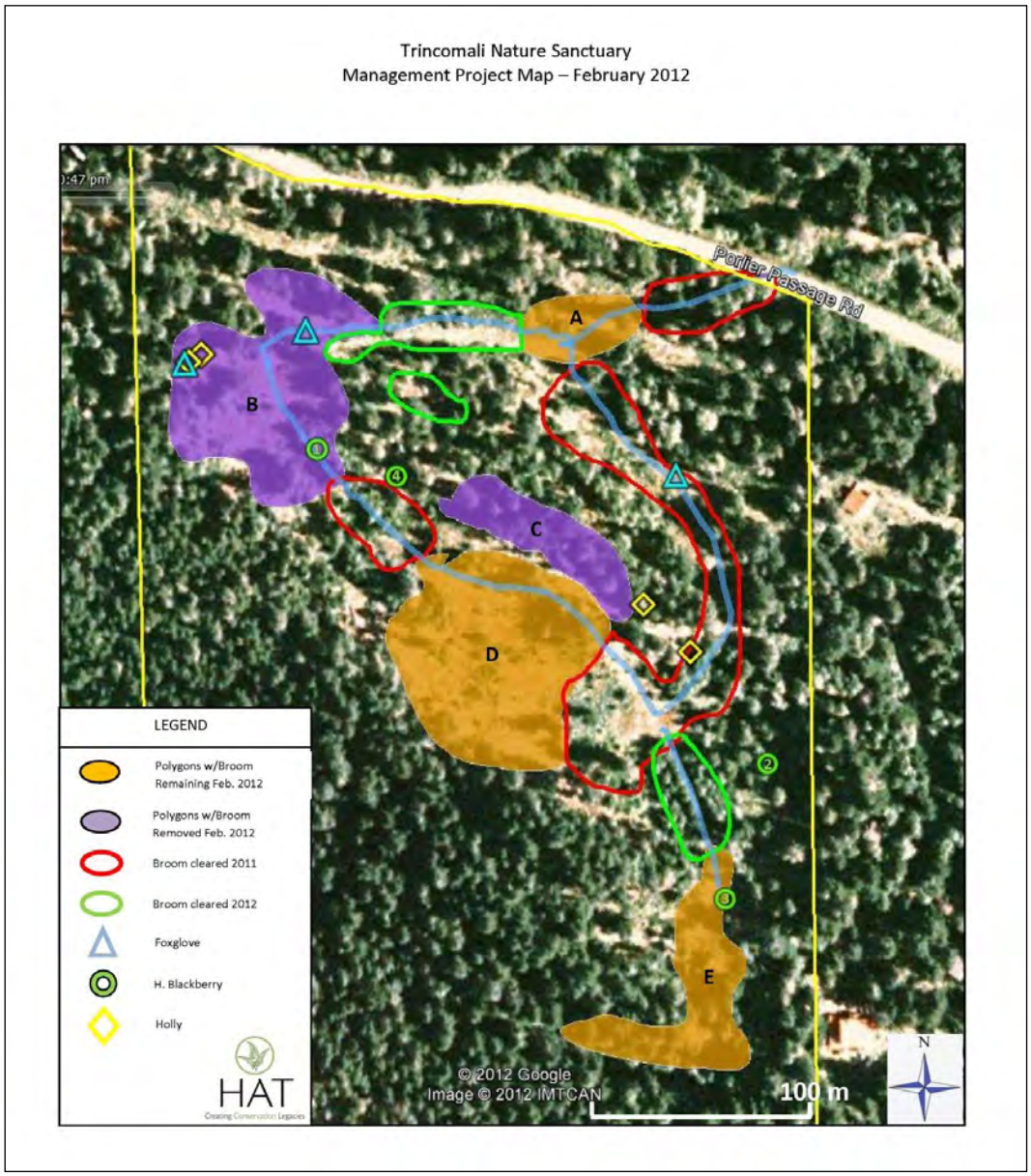


**Photo 8. Scotch Broom biomass Removal event 2012**

Scotch Broom

The best time for removal is during the winter when the plant is in dormancy. The plant should be cut at its first lateral root below the soil. Care should be taken so as to not disturb the soil upon removal as Scotch Broom is effective at colonizing disturbed soils. Removing the Scotch Broom in the summer, prior to the broom setting seed, is another effective time for removal. However, this is not the preferred option for the bluffs and along the cliffs given human disturbance concerns to the Peregrine Falcon. Removal in the recently logged area could occur at any time of the year, with early winter to early spring being the most advantageous, given the weakened state of the plant in dormancy.

Himalayan and Cutleaf Blackberry

Cutleaf and Himalayan Blackberry are non-native blackberry species that are found in the Sanctuary and should also be a priority for removal.
Non-indigenous species of Blackberry are highly invasive and extremely difficult to control once established. They out compete native herbaceous understory and shade out the establishment of native shrubs and trees. These Blackberry species can also reduce forage materials and restrict the movement of animals and birds. Blackberry is dispersed by seeds (birds) or vegetatively. Roots, stems and canes touching the

ground can re-sprout or produce daughter plants. There were three isolated populations of Cutleaf Blackberry found in 2011 in the Sanctuary, and more are likely to exist near the northern boundary, due to the large population existing in the wetlands across Porlier Pass Road.

English Holly

English Holly invades native forest habitat, where dense thickets can suppress germination of growth of native trees. They require abundant moisture to thrive, and can prevent surrounding plants from obtaining sufficient water to survive. The berries of Holly are toxic to humans and dispersed by birds. Holly can also spread vegetative through suckering and layering, which, when established in this way, is extremely difficult to eradicate.

For up-to-date invasive management techniques, the Management Group should consult the manual published by the Garry Oak Ecosystem Recovery Team (GOERT) "Best Management Practices and Field Manual for Invasive Species"[8] which includes thoroughly researched and current management practices for the removal of common invasive species such as Scotch Broom, non-native Blackberry species, and English Holly. The Coastal Invasive Species Committee (CISC)[9] is another excellent resource for identification, management and disposal of invasive species.

### 4.1.13 Fire Management

Natural forest fires were historically a common phenomenon in the Coastal Douglas-fir ecosystems prior to settlement. Today, forest fires are suppressed due to development in and around these forests. Fuel-load build-up has accumulated over the last 100 years or so, and many of our intact forests have become susceptible to natural and deliberate forest fires. There is potential for vandalism presented at the TNS, and perhaps an additional threat due to the slash piles in the recently logged area which are highly combustible.

Fortunately, the Coastal Bluff, Woodland and Older Forest ecosystems are not easily accessible and public use is prohibited; therefore the risk of accidental or deliberate fire sets is minimal.

A relationship with the North Galiano Volunteer Fire Department (NGVFD) has been established and a plan to clearly identify how the

[8] http://www.goert.ca/publications_resources/general.php
[9] http://www.coastalisc.com/

Sanctuary would be accessed in the event of a fire has been discussed. Environmentally, the preferred access is to fill a portion of the ditch at Porlier Pass Road and enter the Sanctuary along the old logging road. The NGVFD Fire Chief agreed that this is a good access point. The protocol used would be fire apparatus on Porlier Pass Road and hose lines used to move water. In the case of a large fire, the provincial forestry fire services would be called in. The remainder of the Sanctuary can be access via adjoining private properties off of Porlier Pass Road and Alder Way. The Fire Chief agreed that the best method to reduce accidental fire risk is to discourage use of the Sanctuary.

Controlled Burns

Controlled burns to dispose of invasive plant biomass accumulated from removal events must follow the strict guidelines for a "Class A Burning – land clearing debris". These guidelines are listed in the Capital Regional District's Bylaw No. 3452.

Considerations for disposal methods will be discussed by all parties each year to adhere to the current best management practices.

**Photo 9. Scar left from Broom Biomass Burn**

4.1.14 Research

In addition to the ongoing Peregrine Falcon surveys carried out by the Ministry of Forests, Lands and Natural Resource Operations every 5 years, Doyle conducted a separate, 4-year study (1999-2002) of falcons in the Strait of Georgia, including those nesting on the bluffs of the Trincomali Nature Sanctuary. This research included extracting blood and DNA samples to monitor pesticide levels in top predators within the Strait of Georgia and morphometrical studies to confirm the subspecies

(Anatum) at this site. The falcons are banded, which may assist the Sanctuary Wardens in identifying the falcon individuals.

The 2002 falcon research was permitted by the Board in order to complete the Ministries' 4-year study. In that same year, based on comments received by the Board regarding the research at the site, the Trust Fund Board clarified that it will only allow low impact, passive, observational type research at the Trincomali Nature Sanctuary. The intent of the Board, through this management plan, is to protect the habitat on-site from disturbance by human activities. Further, the Board established a new overall research policy. The policy indicates that:

> "on Trust Fund Board lands that are closed to public use because of the potential for disturbance to a particular significant species using the site (e.g., breeding birds), the Board will not permit research during the time period that is considered by the Board to be critical to the health or well-being of the species using the site."

Any research proposed to be conducted outside of critical time periods must be dealt with in accordance with the Trust Fund Board's policy on Research. Doyle (retired in 2011), indicated that a protocol had been developed to notify the Sanctuary Warden(s) and Islands Trust Fund prior to any research activities being undertaken at the Sanctuary. The Management Group should contact the current Wildlife Biologist with the Ministry to ensure that these notifications continue.

In addition, it is recommended that the Warden(s) pass along general observations of the falcons and their behaviour to the ITF or the Management Group so that the information can be relayed to the Wildlife Biologist at the BC Ministry of Forests, Lands and Natural Resources on an annual basis, or more often as required.

## 4.2 Management Strategies

### 4.2.1 General Management Direction

General management direction is to allow natural processes to continue throughout the Sanctuary with the exception of planting of indigenous shrubs to block access at certain locations and removal efforts of any non-indigenous species.

The ITF has established a communication process with both the Sanctuary Warden and the Management Group in the event that the Warden or Management Group observe human-caused disturbances to the seabirds and/or falcons and any inappropriate use of the Sanctuary.

Should the Sanctuary Warden or Management Group notice anything that causes concern, they are to inform the other parties immediately.

### 4.2.2 Management Initiatives

Specific short and long-term management initiatives for TNS were established in 2002, and many of the action items listed were accomplished over the last 12 years. Short-term management strategies included initiatives that were ideally implemented as priorities as soon as funds became available over the next one to three years. Long-term management strategies included initiatives that were ideally implemented over the next ten years.

## 5.0 2002-2013 Management Initiatives Review

A key component during the 2013 update process for this report was reviewing the short and long-term action items that were compiled in 2002. Each action item was reviewed, updated and either completed, or designated as a new action item. Some of the action items have evolved into long-term or ongoing action items and new short-term initiatives were established to enhance the overall objectives of the Sanctuary.

The results of the short and long-term initiatives review and updated action items can be found in sections 5.1 and 5.2, respectively. Section 5.3 encompasses all of the new 2013 updated short, long-term and ongoing action items.

## 5.1 Short-term Management Initiatives Review

**FALCONS AND CORMORANTS**

**Management Concern:**
**Touch and go manoeuvres by aircraft, of a particular airline, have caused disturbance to the seabirds.**

**2002 Action Item 1:**

The Management Group will take a proactive response to this potential problem by contacting the airline to learn more about the nature of their actions and to inform them of the sensitivity of this site.

**2013 Update**:

Completed. In 2008, ITF sent a letter to Transport Canada to alert them to the reports of low flying planes along the bluffs in May & June of that year. There have been no further reports of this disturbance.

**2013 Action Item (Ongoing):**

No further action required, unless situation arises again.
Warden(s) will report any new incidences to Management Group.

**FALCONS AND CORMORANTS**

**Management Concern:**
**Human-caused disturbance to the nesting colonies.**

**2002 Action Item 2:**

1) When on-foot human disturbance is observed, the Sanctuary Warden will speak directly with the offenders to advise that they are disturbing birds and that they are in a prohibited area. If necessary, the warden will contact the RCMP for assistance.

2) When dealing with boats or aircraft, attempt will be made to obtain an identification number. The owners will be contacted via phone with a follow-up letter, written by the Management Group, indicating that the boat or aircraft operators' actions caused disturbance to the birds and requesting to avoid the area in the future.

3) The Sanctuary Warden is to contact the Management Group or ITF if major concerns arise.

**2013 Update**

Human-caused disturbance appears to be a minimal threat at this site. Action Item revised.

**2013 Action Item (Ongoing):**

1) On-foot human disturbance: if the situation is not threatening, the Sanctuary Warden will speak directly with the offenders to advise that they are disturbing nesting birds, they are in a prohibited area and ask them to leave the area. If necessary, the warden will contact the RCMP for assistance.

2) Boats or aircraft: attempt will be made to obtain an identification number. The Management Group will contact the owners via phone, with a follow-up letter indicating that the boat or aircraft operators' actions caused disturbance to the birds and requesting to avoid the area in the future.

3) The Sanctuary Warden is to contact the Management Group or ITF if major concerns arise.

**FALCONS AND CORMORANTS**

**Management Concern:**
**Human-caused disturbance to the nesting colonies (cont.)**

**2002 Action Item 3:**

The Management Group, in consultation with ITF, will ensure that the placement and content of the educational signs at Montague Harbour is appropriate. These signs should communicate both the importance of seabird populations and their sensitivity to disturbance.

**2013 Update:**

The signs posted at Montague Harbour have since been removed.

**2013 Action Item (Short-term):**

The Management Group will post two of the laminated Cormorant Posters published by the Ministry of Environment at Montague Harbour, one on the community posting board and one on the docks.

**RECENTLY LOGGED AREA**

**Management Concern:**
**Restoration of the Recently Logged Area**

**2002 Action Item 4:**

The Management Group will allow natural successional processes to continue. Some replanting may be permitted with approval of ITF, the Management Group and Covenant Holders and if such activities are in accordance with the purpose and objectives outlined in Sections 1.1 and 1.2 and the conservation covenant on the property.

**2013 Update:**

Natural succession is occurring at the TNS; however active invasive species management of the site must be an ongoing management goal for the long-term. Planting native shrubs for blocking public access and enhancing areas that have been cleared of Broom would be advantageous to encouraging succession.

**2013 Action Item**

**(Short-term):**
The Management Group will provide a cost estimate to ITF for the necessary supplies and labour required to place protective fencing around the saplings establishing on the old logging road.

**(Long-term):**
The Management Group will allow natural successional processes to continue. Some planting of native shrubs may be beneficial with approval of ITF, the Management Group and Covenant Holders and if such activities are in accordance with the purpose and objectives of this Plan and the Conservation Covenant. Invasive species management throughout the Sanctuary will continue to be a long-term initiative.

**RECENTLY LOGGED AREA**

**Management Concern:**
**Logging Slash Piles**

**2002 Action Item 5:**

The Management Group will remove or disperse the slash piles remaining from logging activity.

**2013 Update**:

The Management Group discussed with ITF the feasibility and necessity of removing or dispersing the slash piles in the Sanctuary (see Section 4.16). The Galiano Fire Chief rated the fire hazard threat of these piles as low and not necessary to remove or disperse (see Fire Questionnaire, Appendix 2). The Management Group recommends that the slash piles be left on-site, undisturbed unless further threat is identified.

**2013 Action Item (Long-term):**

ITF and the Management Group should review potential hazards from slash piles within the next 10 years.

**RECENTLY LOGGED AREA**

**Management Concern:**
**Public access to the bluffs (closed portion of Sanctuary).**

**2002 Action Item 6:**

Within the first 2to 2.5 years, the Management Group will plant a native berry-producing shrub at the junction of the spur road and the logging road as well as at the chaingate off of Porlier Pass Road.

**2013 Update**:

As of 2013, planting of native vegetation has not occurred at the Sanctuary. The old-growth section of the parcel and the hiking path along the bluffs and above the nesting seabird colonies appears to get very little recreational use to date. Signs were posted in 2012 at the spur-trails leading to the bluffs to discourage entrance (see section 4.19). However, the Management Group recommends the planting of vegetation at key access points remain a priority.

**2013 Action Item (Short-term):**

The Management Group will plant native shrubs at key public access points leading to the bluffs to discourage the public from disturbing the nesting seabird colonies and sensitive ecosystems along the bluffs.

**APPROPRIATE USE**

**Management Concern:**
**Inappropriate activities in the Sanctuary including overnight use and campfires.**

**2002 Action Item 7:**

Public use of any kind (other than monitoring and implementing management plan strategies) within the Coastal Bluff/Woodland area is prohibited. Should the Sanctuary Wardens observe such uses, they will inform the offenders of the allowable activities. If further problems arise, they will contact the RCMP as necessary.

**2013 Update**:

Signs were posted in 2012 at three at three locations within the Sanctuary stating allowable activities (See Section 4.19).

**2013 Action Item (Ongoing):**

Same as 2002 above.

**SIGNAGE**

**Management Concern:**
**Signage for public education for boaters and kayakers on the sensitive nature of the seabird colonies on the bluffs.**

**2002 Action Item 8:**

New signs identifying the 4 project partners and the sensitive nature of the area will be created and placed at the base of the bluffs on either side. One of the signs should replace the existing sign in its current location. The other should be placed 50m from the western boundary of the bluff (with the adjacent landowner's permission).

**2013 Update**:

The original TLC sign at the base of the bluffs is no longer there. The Management Group recommends that the sign at the base of the bluffs not be replaced, and that a new long-term goal is to erect two new signs 50-100 metres from the shoreline on buoys at the margins of the Marine Protection zone.

**2013 Action Item (Long-term):**

The Management Group and ITF will consider the necessity and feasibility of placing signage on buoys at the far boundaries of the Marine Protection Zone below the seabird colony bluffs alerting presence of the protection zone, and educating recreational users of the sensitivity of nesting seabirds.

**SIGNAGE**

**Management Concern:**
**Public awareness signage to discourage access to the nesting colonies along the bluffs and sensitive woodlands ecosystems.**

**2002 Action Item 9:**

The Sanctuary Warden or Management Group will place no trespassing signs at the junction of spur and loop road; at the diverted access route alongside Lot #3; and at the chaingate off Porlier Pass Road.

**2013 Update**:

Completed. Two new signs were placed along the loop trail, at key access routes to the woodlands/bluffs. In addition, a hand-made no-trespassing sign was put up on the old chain-gate tree at the entrance off Porlier Pass Road by a local resident. Since public access is allowed along the loop trail, though not encouraged - the Management Group recommends not having an official sign at the entrance. See Section 4.19.

**2013 Action Item:**

None.

**MONITORING PROGRAM**

**Management Concern:**
**Annual site visits should be performed to monitor the condition of the TNS.**

**2002 Action Item 10:**

Annual Monitoring visits will assess and document:

- Indications of public use;
- Status of bird species of concern (number of nests/individuals);
- Condition of former logging road and extent of regeneration throughout the logged portion;

- Status of non-native plant species populations and new introductions;
- Condition of the old-growth forest and coastal bluff/woodland ecosystems; and
- Condition of the natural spring and health of associated vegetation.

**2013 Update**:

No new updates.

**2013 Action Items:**

**(Short-term):**
The Management Group will evaluate the Hairy Manzanita population on the Coastal Bluffs and begin an annual monitoring process to assess status of this rare plant.

**(Long-term):**
Same as 2002 above.

**FIRE MANAGEMENT**

**Management Concern:**
**Natural and Human-caused Forest Fires Management.**

**2002 Action Item 11:**

The Management Group will notify the NGVFD of the location of the Sanctuary and suggest that in the event of a fire, access along the former logging road is preferred.

**2013 Update**:
The NGVFD is aware of the Sanctuary, and agree that the easiest access to the TNS is from Porlier Pass Road. They have the necessary equipment to cross the ditch if necessary to utilize the old logging road. In addition, they have access from both adjoining properties to the east to reach the old-growth and bluffs if necessary.

**2013 Action Items (Ongoing):**

The Management Group will continue open communication with the current Sanctuary Warden who also volunteers for the NGVFD and send a fire management questionnaire to the fire chief every 5 years to ensure collaboration in the event of a wildfire. See Section 4.1.13.

**FIRE MANAGEMENT**

**Management Concern:**
**Controlled Burns - Invasive Species Disposal**

**2002 Action Item:**

None. New 2013 Action Item.

**2013 Update**:

In 2012, ITF and the Covenant Holders agreed the best disposal method for the large amount of Broom biomass accumulated after major removal events is to burn the Broom on-site in the open and most disturbed portion of the recently logged area within reach of the GIVFD hoses from Porlier Pass Road (See Map # 2). This management technique should be re-evaluated from time-to-time to ensure current disposal methods are discussed and implemented if necessary.

**2013 Action Items (Long-term):**

The Management Group will continue to burn the biomass on-site after invasive plant removal events. The Management Group will follow the protocol in Section 4.1.13 prior to performing any controlled burns.

**INVASIVE SPECIES MANAGEMENT**

**Management Concern:**
**Invasive plant species removal is a priority in the management of the TNS**

**2002 Action Item 12:**

Within the first two years the Management Group will remove the Scotch Broom from the top of the cliff and Blackberry beside the chain gate. The Management Group will continue to monitor and remove (with the help of volunteers) any new growth of non-indigenous Scotch Broom and Himalayan Blackberry within the Sanctuary.

**2013 Update**:

Since the initial Management Plan was written in 2002, invasive plant populations have increased, especially Scotch Broom. In addition, new invasive plants have established in the Sanctuary. Invasive species removal events occurred in 2009, 2010, 2011 and 2012 (See Section 4.1.12). This action item is now considered a long-term management priority.

**2013 Action Items**

**(Short-term):**

The Management Group will continue remove invasive species at TNS, targeting Scotch Broom, English Holly, non-indigenous Blackberry species and Foxglove and burn the biomass on-site. The Management Group will follow the protocol in Section 4.1.13 prior to performing any controlled burns.

**(Long-term):**

The ITF and Management Group will evaluate the threat of invasive plant species at the TNS as necessary to maintain the ecological integrity of the Sanctuary.

**SHARP-TAILED SNAKE**

**Management Concern:**
**Suitable Sharp-tailed Snake (STS) habitat has been found to exist within the Sanctuary along the woodlands and bluffs.**

**2002 Action Item:**

None. New 2013 Action Item

**2013 Update**:

In 2011, the CDC established STS suitable habitat polygons throughout Southern Vancouver Island and the S. Gulf Islands. The Coastal Bluffs and Woodlands along the coast of the Sanctuary are included within a longer polygon extending down the southern-exposure length of the Island. Monitoring for STS would be beneficial to determining whether this red-listed species is actually present.

**2013 Action Items (Short-term):**

The Management Group and ITF will collaborate with local STS experts on the best locations to place artificial cover objects along the Coastal Bluffs and Woodlands to monitor for STS presence. The Management Group will work with the Sanctuary Wardens to provide them with the information necessary to monitor for STS presence. Monitoring for STS will adhere to the Peregrine Falcon guideline recommendations during the sensitive breeding season.

## 5.2 Mid and Long-term Management Initiatives Review

**FALCONS AND CORMORANTS**

**Management Concern:**
**Collaboration with Provincial and Federal entities to protect seabird habitat**

**2002 Action Item 13:**

The ITF will work to establish Memoranda of Understanding with the Ministry of Water, Land and Air Protection, the Ministry of Agriculture, Fisheries and Food and Fisheries and Oceans Canada to set out commitments of each group toward the protection of the seabird habitat (as per Section IV. 2h.iv. of the Galiano Island Official Community Plan).

**2013 Update**:

The Ministry of Forests, Lands and Natural Resources Operations has performed seabird nest counts almost annually over the last 20 years and the Ministry of Environment has performed Peregrine Falcon Surveys every 5 years, including those at TNS since 1980. There has been no official Memorandum of Understanding signed, however communication between ITF, the Management Group and the Ministry has been ongoing.

**2013 Action Items:**

**(Short-term):**
The Management Group will collaborate with the Ministry of Forests, Lands and Natural Resources to ensure that funding is available to perform seabird nest count surveys on an annual basis. The Management Group will assist the Ministry in performing the surveys as funding allows.

**(Ongoing):**
1) The Management Group and ITF will consider the necessity and feasibility of placing signage on buoys at the far boundaries of the Marine Protection Zone below the seabird colony bluffs alerting presence of the protection zone, and educating recreational users of the sensitivity of nesting seabirds.

2) The Management Group will collaborate with the Ministry of Environment to ensure that open communication is ongoing regarding the 5-year Peregrine Falcon monitoring surveys and results.

**ZONING**

**Management Concern:**
**Changing the zoning and designation of the Sanctuary**

**2002 Action Item 14:**

The ITF will request the Local Trust Committee to change the designation and zoning of the property from Forest to Natural Protection at the time of the next OCP and Land Use By-law are being comprehensively amended.

**2002 Action Item 15:**

The ITF will submit a request to the Local Trust Committee to have a marine protection zone extending from the bluffs to a distance of at least 100 m offshore of the sanctuary when the Land Use Bylaw is being comprehensively amended.

**2013 Update**:

Completed. The TNS is now designated and zoned as a Nature Park, in addition, the marine area below the cliffs, approximately 100 metres out from the shore has been designated as Marine Park.

**2013 Action Items:**

None.

## 5.3 2013 Management Initiatives

The following is a consolidated list of the new updated 2013 Management Initiatives.

### 5.3.1 Falcons and Cormorants

**Short-term Action Items**

**Management Concern:** **Boat and Kayak disturbance to nesting colonies.**

Action Item: The Management Group will post two of the laminated Cormorant Posters published by the Ministry of Environment at Montague Harbour, one on the community posting board and one on the docks.

## Long-term Action Items

**Management Concern:** **Boat and Kayak disturbance to nesting colonies.**

Action Item: The Management Group and ITF will consider the necessity and feasibility of placing signage on buoys at the far boundaries of the Marine Protection Zone below the seabird colony bluffs alerting presence of the protection zone, and educating recreational users of the sensitivity of nesting seabirds.

**Management Concern:** **Collaboration with Provincial and Federal entities to protect seabird habitat.**

Action Item: The Management Group will collaborate with the Ministry of Forests, Lands and Natural Resources to ensure that funding is available to perform seabird nest count surveys on an annual basis. The Management Group will assist the Ministry in performing the surveys as funding allows.

Action Item: The Management Group will collaborate with the Ministry of Environment to ensure that open communication is ongoing regarding the 5-year Peregrine Falcon monitoring surveys and results.

## Ongoing Action Items

**Management Concern:** **Touch and go manoeuvres by aircraft, of a particular airline, have caused disturbance to the seabirds.**

Action Item: Current Warden(s) will report any new incidences to Management Group. No further action required, unless situation arises again.

**Management Concern:** **Human-caused disturbance to the nesting colonies.**

Action Item: <u>On-foot human disturbance</u>: if the situation is not threatening, the Sanctuary Warden will speak directly with the offenders to advise that they are disturbing nesting birds, they are in a prohibited area and ask them to leave the area.

If necessary, the warden will contact the RCMP for assistance.

Action Item: Boats or aircraft: attempt will be made to obtain an identification number. The Management Group will contact the owners via phone, with a follow-up letter indicating that the boat or aircraft operators' actions caused disturbance to the birds and requesting to avoid the area in the future.
The Sanctuary Warden is to contact the Management Group or ITF if major concerns arise.

### 5.3.2 Recently Logged Area

**Short-term Action Items**

**Management Concern:** **Public access to the bluffs (closed portion of Sanctuary).**

Action Item: The Management Group will plant native shrubs at key public access points leading to the bluffs to discourage the public from disturbing the nesting seabird colonies and sensitive ecosystems along the bluffs.

Action Item: The Management Group will cost out the supplies necessary to place protective fencing around the saplings establishing on the old logging road in the short-term.

**Long-term Action Items**

**Management Concern:** **Restoration of the recently logged area**

Action Item: The Management Group will allow natural successional processes to continue. Some planting of native shrubs may be beneficial with approval of ITF, the Management Group and Covenant Holders and if such activities are in accordance with the purpose and objectives of this Plan and the Conservation Covenant. In addition, invasive species management throughout the Sanctuary will be a long-term initiative.

### 5.3.3 Sharp-tailed Snake Habitat

**Short-term Action Items**

**Management Concern:** **Suitable Sharp-tailed Snake (STS) habitat has been found to exist within the Sanctuary along the woodlands and bluffs.**

Action Item: The Management Group and ITF will collaborate with local STS experts on the best locations to place artificial cover objects along the Bluffs and Woodlands to monitor for STS presence. The Management Group will work with the Sanctuary Wardens to provide them with the information necessary to monitor for STS presence. Monitoring for STS will be considerate of the Peregrine Falcon guideline recommendations during the sensitive breeding season.

### 5.3.4 Logging Slash Piles

**Short-term Action Items**

**Management Concern:** **Slash piles may create additional fire and pest hazards.**

Action Item: ITF and Management Group should review potential hazards from slash piles within the next 10 years.

### 5.3.5 Appropriate Use

**Ongoing Action Items**

**Management Concern:** **Inappropriate activities in the Sanctuary including overnight use and campfires.**

Action Item: Public use of any kind (other than monitoring and implementing management plan strategies) within the Coastal Bluff/Woodland area is prohibited. Should the Sanctuary Wardens observe such uses, they will inform the offenders of the allowable activities. If further problems arise, they will contact the RCMP as necessary.

### 5.3.6 Monitoring Program

**Short-term Action Items**

**Management Concern:** **Cormorant Nest-count surveys.**

Action Item: The Management Group will apply for a small amount of funding annually from ITF to assist in the Ministry's cormorant survey at TNS.

**Management Concern:** **Hairy Manzanita population on bluffs.**

Action Item: The Management Group will evaluate the Hairy Manzanita population on the Coastal Bluffs and begin an annual monitoring process to assess current status of this rare plant.

## Long-term Action Items

**Management Concern:** **A complete vegetation and rare plant survey has not been conducted.**

Action Item: ITF and the Management Group will discuss the feasibility to contract a qualified botanist to conduct a vegetation and rare plant survey at the TNS within the next five years. The Management Group will also contact local volunteer biologists to see if a volunteer survey could be completed.

## Ongoing Action Items

**Management Concern:** **Annual site visits should be performed to monitor the condition of the TNS.**

Action Item: Annual Monitoring visits will assess and document:
1) Indications of public use;
2) Status of bird species of concern (number of nests and individuals);
3) Condition of former logging road and extent of regeneration throughout the logged portion;
4) Status of non-native species populations, and new introductions;
5) Condition of the old-growth forest and coastal bluff/woodland ecosystems; and
6) Condition of the natural spring and health of associated vegetation.

### 5.3.7 Invasive Species Management

**Short-term Action Items**

| | |
|---|---|
| **Management Concern:** | **Removal of priority invasive plants** |
| Action Item: | The Management Group will continue to perform at the minimum, bi-annual invasive species removal events at TNS, targeting Scotch Broom, English Holly, non-indigenous Blackberry species and Foxglove. |

**Long-term Action Items**

| | |
|---|---|
| **Management Concern:** | **Disposal of invasive plant biomass** |
| Action Item: | The Management Group will continue to remove Scotch Broom and other invasive plant species from the TNS and burn the biomass on-site. The Management Group will follow the protocol in Section 4.1.13 prior to performing any controlled burns. |

### 5.3.8 Fire Management

**Ongoing Action Items**

| | |
|---|---|
| **Management Concern:** | **Forest Fires** |
| Action Item: | The Management Group will continue open communication with the current Sanctuary Warden who also volunteers for the NGVFD and send a fire management questionnaire to the fire chief every 5 years to ensure collaboration in the event of a wildfire. See Section 4.1.13. |

## 6.0 Summary of 2013 Short-term Action Items

The following is a summary of recommended short-term action items at Trincomali Nature Sanctuary:

1. Post laminated Cormorant Posters at Montague Harbour.

2. Plant native shrubs at key public access points leading to the bluffs.
3. Cost out the supplies necessary to place protective fencing around the saplings establishing on the old logging road.
4. Collaborate with local experts to set up monitoring for Sharp-tailed Snake presence along the Coastal Bluffs and Woodlands.
5. Review potential hazards from slash piles.
6. Assist in the Ministry's cormorant survey at the TNS.
7. Evaluate the Hairy Manzanita population on the Coastal Bluffs and begin annual monitoring.
8. Perform at the minimum, bi-annual invasive species removal events.
9. Continue annual monitoring at the Sanctuary.

## 7.0 Conclusions

The Trincomali Nature Sanctuary is of provincial significance by virtue of the sensitive ecosystems, such as the Coastal Bluffs and Woodlands and the seabird nesting colonies found on the bluffs for the cormorants and Peregrine Falcons that reside therein. Peregrine Falcons and Double-crested Cormorants are provincially red-listed as imperiled and Olive-sided Flycatchers are listed as a species of concern, as defined by the B.C. Conservation Data Centre, and their habitat requires protection. Due to the fluctuation in active nest counts observed during the Ministry surveys, annual surveys are critical to maintain current trends in the nesting sea bird populations.

Coastal bluff vegetation is sensitive to human disturbances such as trampling and invasive plant species. Peregrine Falcons and Cormorants are prone to human disturbance as shown in the recent study by Species at Risk Biologist, Chatwin (Chatwin 2011). Therefore, the Precautionary Principle should be applied, as there have already been observations of airplanes, helicopters and boats causing disturbance of all the nesting colonies in the past.

The Islands Trust Fund is in a unique position, through its mandate to acquire, conserve and manage valued areas, to offer protection for this ecosystem and its species.

Over the longer term, the Islands Trust Fund, the Management Group and the Sanctuary Wardens will work cooperatively to monitor the site

and ensure natural processes are taking place without negative human influence.

## 8.0 References

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# APPENDICES
# APPENDIX 1 TABLES
# TABLE 1

## Plant Species List
### BC Conservation Data Centre (CDC)
### Site Visit July 12, 2001

| Location | Species Observed |
|---|---|
| Bluff close to shore with nesting cormorants | *Pseudotsuga menziesii*<br>*Arbutus menziesii*<br>*Quercus garryana*<br>*Symphoricarpos albus*<br>*Holodiscus discolor*<br>*Grindelia integrifolia*<br>*Cytisus scoparius*<br>*Acer macrophyllum* |
| Under cliff | *Acer macrophyllum*<br>*Holodiscus discolor*<br>*Grindelia integrifolia*<br>*Heuchera micrantha*<br>*Sedum spathulifolium*<br>*Achillea millefolium*<br>*Vulpia bromoides*<br>*Bromus pacificus* |
| Lower down | *Rubus ursinus*<br>*Bromus pacificus*<br>*Mahonia aquifolium*<br>*Sanicula crassicaulis* |
| In ravine | *Quercus garryana (large)*<br>*Acer macrophyllum*<br>*Prunus emarginata*<br>*Pteridium aquilinum* |
| Top of cliff (Old Astbury property) | *Arbutus menziesii*<br>*Pseudotsuga menziesii*<br>*Lonicera hispidula*<br>*Luzula multiflora s.l.*<br>*Elymus glaucus*<br>*Mycelis muralis*<br>*Melica harfordii* |

| | |
|---|---|
| Waypoint 075:<br>48 deg. 55' 27.6" 123 deg. 27'<br>39.9" 12 JUL 01 | *Hedera helix*<br>*Hypochaeris radicata*<br>*Aira praecox*<br>*Bromus vulgaris*<br>*Piperia transversa*<br>*Thuja plicata*<br>*Rosa gymnocarpa*<br>*Dactylis glomerata*<br>*Gaultheria shallon*<br>*Ribes sanguineum*<br>*Mahonia aquifolium*<br>*Mahonia nervosa*<br>*Trientalis latifolia*<br>*Vicia hirsuta*<br>*Satureja douglasii*<br>*Arbutus menziesii - seedlings*<br>*Anthoxanthum odoratum*<br>*Kickxia elatine*<br>*Festuca occidentalis* |
| Waypoint 075:<br>48 deg. 55' 27.6" 123 deg. 27'<br>39.9" 12 JUL 01 (cont) | |
| Dry Douglas-fir forest ~50 years old | *Lonicera hispidula*<br>*Mahonia nervosa*<br>*Festuca occidentalis*<br>*Piperia transversa*<br>*Arbutus menziesii*<br>*Elymus glaucus*<br>*Moehringia macrophylla*<br>*Madia madioides*<br>*Cytisus scoparius* |
| Open top of bluffs | *Vulpia bromoides*<br>*Eriophyllum lanatum*<br>*Vulpia myuros*<br>*Rosa gymnocarpa*<br>*Sedum spathulifolium*<br>*Dicranum scoparium*<br>*Selaginella wallacei*<br>*Danthonia spicata* |
| Stand of Hairy Manzanita | *Arctostaphylos columbiana*<br>*Cladina spp.*<br>*Vulpia microstachys* |
| Edge of Douglas-fir forest | *Pseudotsuga menziesii*<br>*Goodyera oblongifolia*<br>*Corallorhiza maculata*<br>*Eurhynchium oregana*<br>*Thuja plicata*<br>*Monotropa uniflora* |
| Forest with large amounts of debris | *Gaultheria shallon*<br>*Pteridium aquilinum*<br>*Mycelis muralis* |

| | |
|---|---|
| Along old logging road | *Alnus rubra*<br>*Galium triflorum*<br>*Trientalis latifolia*<br>*Achlys triphylla*<br>*Polystichum munitum*<br>*Abies grandis*<br>*Equisetum telmateia*<br>*Blechnum spicant*<br>*Athyrium filix-femina*<br>*Rubus leucodermis* |
| Along old logging road (cont) | *Trisetum cernuum*<br>*Urtica lyallii*<br>*Rubus spectabilis*<br>*Rubus ursinus*<br>*Cirsium brevistylum*<br>*Holcus lanatus*<br>*Scirpus microcarpus*<br>*Geum macrophyllum* |
| Area with winter water flow | *Poa nemoralis*<br>*Carex deweyana*<br>*Elymus glaucus*<br>*Holodiscus discolor*<br>*Hypochaeris radicata*<br>*Trifolium repens*<br>*Veronica serpyllifolia*<br>*Anaphalis margaritacea*<br>*Cerastium holosteoides*<br>*Cirsium vulgare*<br>*Epilobium ciliatum*<br>*Cirsium arvense*<br>*Trifolium dubium*<br>*Satureja douglasii* |
| Logged area | *Dactylis glomerata*<br>*Lychnis coronaria*<br>*Agrostis gigantea*<br>*Cirsium arvense*<br>*Agrostis exarata*<br>*Hypochaeris radicata*<br>*Spergularia rubra*<br>*Gnaphalium sp.*<br>*Anaphalis margaritacea*<br>*Cerastium holosteoides*<br>*Pteridium aquilinum*<br>*Holcus lanatus*<br>*Trifolium repens* |

| | |
|---|---|
| Douglas-fir young | *Rubus leucodermis*<br>*Satureja douglasii*<br>*Gaultheria shallon*<br>*Taxus brevifolia*<br>*Leucanthemum vulgare*<br>*Matricaria matricarioides*<br>*Vicia sativa*<br>*Deschampsia elongata*<br>*Rumex obtusifolius*<br>*Digitalis purpurea*<br>*Pteridium aquilinum*<br>*Prunella vulgaris*<br>*Plantago lanceolata*<br>*Hypochaeris radicata* |
| Douglas-fir young (cont) | *Crepis capillaris*<br>*Poa pratensis*<br>*Poa compressa*<br>*Deschampsia elongata*<br>*Polystichum munitum*<br>*Spergularia rubra*<br>*Galium aparine*<br>*Anthoxanthum odoratum*<br>*Plantago major*<br>*Salix scouleriana*<br>*Prunus emarginata*<br>*Sambucus racemosa*<br>*Abies grandis*<br>*Juncus effusus*<br>*Holodiscus discolour*<br>*Sagina procumbens*<br>*Rosa gymnocarpa*<br>*Tsuga heterophylla* |
| Remnant forest sloping north | *Tiarella trifoliata*<br>*Achlys triphylla*<br>*Peltigera (gray)*<br>*Athyrium filix-femina*<br>*Ranunculus acer*<br>*Linnaea borealis* |
| Along ditch down Porlier Pass Road | *Tsuga heterophylla*<br>*Rubus parviflorus*<br>*Rubus spectabilis*<br>*Polystichum munitum*<br>*Tiarella trifoliata* |

| | |
|---|---|
| In ditch along Porlier Pass Road | *Juncus ensifolius*<br>*Acer macrophyllum*<br>*Claytonia sibirica*<br>*Rhytidiadelphus triquetrus*<br>*Hylocomium splendens*<br>*Carex deweyana*<br>*Oenanthe sarmentosa*<br>*Stachys cooleyae*<br>*Equisetum telmateia*<br>*Lysichiton americanus*<br>*Tellima grandiflora*<br>*Poa trivialis*<br>*Rubus spectabilis*<br>*Ranunculus repens* |
| Along Porlier Pass Road proper | *Juncus tenuis s.l.*<br>*Geum macrophyllum*<br>*Myosotis laxa*<br>*Lonicera ciliosa*<br>*Veronica americana*<br>*Fragaria vesca*<br>*Prunella vulgaris*<br>*Vicia sativa*<br>*Lathyrus nevadensis*<br>*Mimulus moschatus*<br>*Vicia cracca*<br>*Trifolium pratense* |

## TABLE 2

## Birds Identified Onsite at TNS

| Common Name | Latin Name |
|---|---|
| American Robin | *Turdus migratorius* |
| American Goldfinch | *Spinus tristis* |
| Bald Eagle | *Haliaeetus leucocephalus* |
| Bewick's Wren | *Thryomanes bewickii* |
| Brown Creeper | *Certhia americana* |
| Cedar wax wing | *Bombycilla cedrorum* |
| Chestnut-backed Chickadee | *Poecile rufescens* |
| Dark-eyed Junco | *Junco hyemalis* |
| Double-crested Cormorant* | *Phalacrocorax auritus* |
| Glaucous-winged Gull | *Larus glaucescens* |
| Golden-crowned Kinglet | *Regulus satrapa satrapa* |
| Hairy Woodpecker | *Dendrocopus villosus* |
| House Finch | *Carpodacus mexicanus* |
| Northern Flicker | *Colaptes auratus cafer* |
| Northwestern Crow | *Contopus copperi* |
| Olive-sided Flycatcher**[10] | *Nuttallornis borealis* |
| Pacific-slope Flycatcher | *Empidonax difficilis* |
| Pelagic Cormorant*** | *Phalacrocorax pelagicus* |
| Peregrine Falcon* | *Falco peregrinus anatum* |
| Pigeon Guillemot | *Cepphus columba* |
| Pileated Woodpecker | *Dryocopus pileatus* |
| Pine Siskin | *Carduelis pinus* |
| Raven | *Corvus corax* |
| Red-breasted Nuthatch | *Sitta canadensis* |
| Song Sparrow | *Melospiza melodia* |
| Spotted Towhee | *Pipilo maculates* |
| Violet-green Swallow | *Tachycineta thalassina* |
| Western Tanager | *Piranga ludoviciana* |
| White-crowned Sparrow | *Zonotrichia leucophrys* |
| Pacific Wren | *Troglodytes pacificus* |

* CDC Red-listed species
** CDC Blue-listed species
*** CDC Yellow-listed species: not in risk in BC, but may be vulnerable during times of seasonal concentrations (eb. breeding colonies).

[10] upgraded to Blue-list in 2009

# TABLE 3

## Historic Record of Pelagic Cormorant Nest Surveys in the Strait of Georgia

Surveys 2009: Black = Trudy Chatwin Blue = Harry Carter Red = Jessica Adkins
Surveys 2010: Black = Trudy Chatwin Blue = Harry Carter Red = William Wilton
Survey PECO: Mandarte: 1960: Rudy Drent and G.F. van Tets 150 nests, 1961: G. Clifford Carl: 250 nests, 1968: 344 nests, 1970: Ian Roberstson 504 nests, 1979: Chris Shepard 594 nests

Pelagic cormorant nest counts completed between 1955 and 2012 in the Strait of Georgia.

| *Location* | *1955* | *1959* | *1960* | *1974* | *1983* | *1987* | *1990* | *1991* | *1992* | *1993* | *1994* | *1995* | *1998* | *1999* | *2000* | *2006* | *2007* | *2008* | *2009* | *2010* | *2012* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active Pass | | | | 1 | 0 | 0 | | | | | | | | | 0 | | | | | | |
| Arbutus Island cliffs | | | | | 16 | 18 | | | | | | | | | 2 | 0 | 9 | | 22 | | |
| Ballenas Islands | | | | 24 | 0 | 0 | | | | | | | | | 0 | | 0 | | 0 | | |
| Ballingall Islets | | 11 | | | 0 | 2 | | | | | | | | | 0 | | 0 | | 0 | | |
| Bare Point, Chemainus | | 50 | | 118 | 373 | 142 | 40 | | | | | | 26 | 8 | 0 | | 0 | | 0 | | |
| Burrard St. Bridge | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | | | | 47 | 137 | |
| Christie I. & Pam Rs. | | | | 3 | 80 | 44 | | | | | | | | | 19 | | | | | | |
| Chrome Island | | | | 54 | 78 | 141 | 80 | 67 | 122 | 171 | 220 | 212 | | 134 | 57 | | 0 | 0 | | 0 | 10 |
| East Point, Saturna I. | | | | 54 | 53 | 12 | | | | | | | | | 0 | | 0 | | 0 | | |
| Elliot Bluff, Saturna I. | | | | 10 | 0 | 0 | | | | | | | | | 0 | | 0 | | 0 | | |
| Five Fingers Island | | | | | 115 | 17 | 51 | 37 | 118 | 52 | 96 | 78 | | 0 | 2 | | 0 | 0 | 0 | | |
| Franklin R. & Merry I. | | | | 130 | 18 | 22 | | | | | | | | | 0 | | | | | | |
| Gabriola Island cliffs | | 7 | | 367 | 0 | 0 | | | | | | | | | 62 | 94 | 56 | 2 | 75 | | |
| Galiano Island cliffs | | | | | 0 | 72 | | | | | | | | | 11 | 0 | 48 | | 39 | | |
| Gordon Head cliffs | 20 | | | 20 | 13 | 24 | | | | | | | 0 | | 0 | | 0 | | | | |
| Granville St. Bridge | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | | | | 26 | 127 | |
| Great Chain Island | | 74 | | 183 | 203 | 248 | 204 | | | 41 | 51 | 30 | 20 | 7 | 41 | 19 | 21 | | | | |
| Harris I. & Lewis Reef | | | | 54 | 0 | 0 | | | | | | | | | 0 | | | | | | |
| Hudson Rocks | | 38 | | | 30 | 142 | | 40 | 39 | 31 | 59 | 61 | | 37 | 3 | 0 | | 0 | 0 | | |
| Mandarte Island | | 375 | | 443 | 550 | 536 | 311 | | 297 | 405 | 280 | 206 | 91 | 37 | 270 | | 374 | | 548 | 558 | |
| McRae Islets | | | | | 0 | 15 | | | | | | | | | 7 | | | | | 22 | |
| Mitlenatch Island | | 155 | | 286 | 318 | 315 | 334 | 330 | 332 | 311 | 337 | 338 | 222 | 311 | 234 | | 327 | | 179 | 173 | |
| N. Pender Island cliffs | | | | | 0 | 8 | | | | | | | | | 17 | 7 | 6 | | 0 | | |
| Passage Island | | | | 48 | 72 | 16 | | | | | | | | | 21 | | | | | | |
| Prospect Pt. & Siwash | | | | | 64 | 93 | | | | | | | | | 12 | | | | | 0 | |
| Rk. | | | | | | | | | | | | | | | | | | | | | |
| Race Rocks | | 45 | | 160 | 143 | 120 | | | | | | | | | 0 | 0 | 0 | | 0* | | |
| Rock near Rabbit Island | | | | | | | | | | | | | | | | | | | | 41 | |
| Second Narrows Bridge | | | | | 10 | 90 | | | | | | | | | 201 | | | | 130 | 172 | |
| Sisters Islets | | | | 41 | 51 | 0 | | | | | | | | | 0 | | | | | | |
| Snake Island | | 15 | | 22 | 60 | 74 | | | | | | | | | 41 | 1 | 0 | 0 | | | |
| St. John Pt, Hornby | 50 | | | 9 | 127 | 101 | | | | | | | | | 0 | | 0 | 0 | | | |
| Tent Island cliffs | | | | | 0 | 74 | | | | | | | | | 0 | 34 | 2 | | 34 | | |
| Trail Islands | | | | 2 | 15 | 14 | | | | | | | | | 0 | 0 | 0 | | | | |
| Trial Island | | 107 | | | 0 | 0 | | | | | | | | | 0 | 0 | 0 | | | | |
| Valdes Island cliffs | 6 | | | | 6 | 0 | | | | | | | | | 0 | | 0 | | 0 | | |
| Vivian I. & Rebecca R. | | | | 25 | 15 | 3 | | | | | | | | | 0 | | | | 0 | | |
| White Islets | | | | 4 | 38 | 13 | | | | | | | | | 2 | | | | | | |
| **Total nests observed** | **76** | **877** | | **2058** | **2448** | **2356** | **1020** | **474** | **908** | **1011** | **1043** | **925** | **359** | **534** | **1088** | | **843** | | | | |

*0 PECO on Race Rocks from Gary Fletcher in 2009

## TABLE 4

## Historic Record of Double-crested Cormorant Nest Surveys in the Strait of Georgia

| *Location* | *1959* | *1974* | *1983* | *1987* | *1990* | *1991* | *1992* | *1993* | *1994* | *1995* | *1996* | *1998* | *1999* | *2000* | *2006* | *2007* | *2008* | *2009* | *2010* | *2012* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ballingall Island | 28 | 14 | 20 | 25 | | | | | | | | | | 0 | | 0 | | 0 | | |
| Bare Point, Chemainus | 0 | | 198 | 0 | 18 | | | | | | 23 | 19 | 11 | 0 | | 0 | | 0 | 0 | |
| Canoe Islet | 0 | 12 | 0 | 0 | | | | | | | | | | 0 | | 0 | | 0 | | |
| Channel Islands | 16 | | 0 | 0 | | | | | | | | | | 0 | | | | 0 | | |
| Christie I. & Pam Rocks | 0 | 29 | 120 | 119 | | | | | | | | | | 42 | | | | 4 | | |
| Crofton Dolphins | 0 | | 0 | 65 | 44 | 78 | 74 | 74 | 75 | 71 | | | 83 | 104 | ca. 50 | 95 | | 65/0 5 | Nesti ng | Nesti ng |
| Crofton Crane | | | | | | | | | | | | | | | | | | 100 birds 78 | Nesti ng | |
| Five Fingers Island | 0 | | 0 | 138 | 153 | 118 | 191 | 306 | 378 | 295 | | 43 | 42 | 15 | | 0 | 0 | 0 | | |
| Franklin Rk & Merry I. | 0 | 54 | 21 | 5 | | | | | | | | | | 0 | | | | | | |
| Gabriola Cliffs | | | | | | | | | | | | | | | 27 | 95 | 0 | 34 43 | | |
| Galiano Cliffs | 0 | 0 | 0 | 00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 28 | 90 | | 55 47 | | |
| Great Chain Island | | | 135 | 510 | 686 | | | 339 | 444 | 432 | | 300 | 100 | 95 | ca. 40 | ca. 25+1 | | 0 | | |
| Hudson Rocks | 0 | | 0 | 17 | | 67 | 30 | 25 | 16 | 15 | | 0 | 0 | 0 | | | 0 | 0 | | |
| Ladysmith Harbour | | | | | | | | | | | | | | | 7 | 0 | | 0 | | |
| Mandarte Island | 150 | 482 | 1100 | 972 | 473 | | 280 | 458 | 403 | 288 | | 178 | 43 | 215 | | 167 | | 131 143 | 168 | |
| McRae Islet | 0 | | | 0 | | | | | | | | | | 1 | | | | | 6 | |
| Mitlenatch Island | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 33 | 43 | | 46 | 47 | 70 | | 34 | | 20 | 26 | |
| Rock off Rabbit Island | | | | | | | | | | | | | | | | | | | 10 | |
| Rose Islets | 0 | 80 | 12 | 2 | | | | | | | | | 6 | 15 | | 0 | | 0 | | |
| Sand Heads | 0 | | 0 | 86 | | | | | | | | | | 35 | | | | 0 | | |
| Second Narrows Bridge | | | | | | | | | | | | | | | | | | | 69 | |
| Second Sister Islet | 9 | | 0 | 0 | | | | | | | | | | 0 | | | | 0 | | |
| Westshore Range Lights | 0 | | 0 | 42 | | | | | | | | | | 11 | | | | 0 | | |
| **Total Nests Observed** | **203** | **671** | **1606** | **1981** | **1374** | **263** | **575** | **1212** | **1349** | **1144** | **23** | **586** | **332** | **602** | | **507** | | | | |

# APPENDIX 2

## Figures

## FIGURE 1
## North Galiano Volunteer Fire Department Questionnaire Form
**Completed by:**
**Tom Darby (Chief) and Emma Smith (Volunteer Firefighter)**

FIRE SAFETY QUESTIONS:

*I reviewed your questionnaire with Tom Darby, Fire Chief, North Galiano Volunteer Fire Department (E.Smith)*

1. The fire history for this site was not researched for the 1st Management Plan. Do you know any o f the history of fire for this area?
   *No.*

The current Management Plan calls for the removal or dispersal of the slash piles left throughout TNS during logging because of potential fire hazards and vandalism potential. Costs in time, equipment and damage done to the ecology to actually implement this activity is quite extensive. They are currently providing good wildlife habitat.

2. How would you rate the importance of removing or dispersing these piles as far as a management activity in the next 10 years:
   URGENT HIGH MEDIUM **LOW** **NOT NECESSARY**

3. If you rated question #2 as URGENT, HIGH or MEDIUM, are there specific areas which may be more of a priority to remove the piles to reduce fire hazard concerns?

The current Plan states: "There is a need for the establishment of a relationship with the Galiano Island Volunteer Fire Department (GIVFD) to clearly identify how the sanctuary would be accessed in the event of a fire. The preferred access is to fill a portion of the ditch at Porlier Pass Road and enter the sanctuary along the old logging road." My understanding is that the GIVFD can access a fire within the sanctuary by parking along Porlier Pass, utilizing a very long hose length.

*Tom, agreed that this is a good access point. Fire apparatus on Porlier, hose lines used to move water. In the case of a large fire, the Provincial forestry fire services would be called in.*

1

4. How would access to the remainder of the Sanctuary be achieved?

   *There is road access available on my property and Derek's old property. As mentioned above.*

5. Is there a need to establish a more readily available way for a fire vehicle to be able to enter and drive along the old logging road from Porlier Pass? Note: Our current plan is to allow the vegetation to grow in the previously logged area, and have only a foot-trail remaining.

   *No, further access may encourage more use, which Tom thought could heighten the risk of accidental fire.*

I believe that we have created a fairly good rapport with the NGVFD through our relationship with Emma Smith as a neighbour, volunteer firefighter, and a warden for TNS.

6. Would meeting or communicating with the fire-chief directly to address these or other questions be advised?

   *I am attaching the NGVFD Fire Chief's contact email address. Tom, said if you have further questions he would be happy to assist.*

7. Do you have any other comments, concerns or suggestions regarding the fire management of the Sanctuary?

   *No*

2

## FIGURE 2
## Sanctuary Warden Questionnaire Form
**Completed by E. Smith**

1. How are you finding the experience of being a warden for TNS?

   *The experience so far has been good. Over the years, I've had the opportunity to meet and get to know the team that is responsible for the Sanctuary, and so far they have all been great.*

2. Do you have any concerns regarding TNS, or the management of the reserve?

   *No, not at this time.*

3. Do you have any suggestions, comments or questions about TNS or your role as warden?

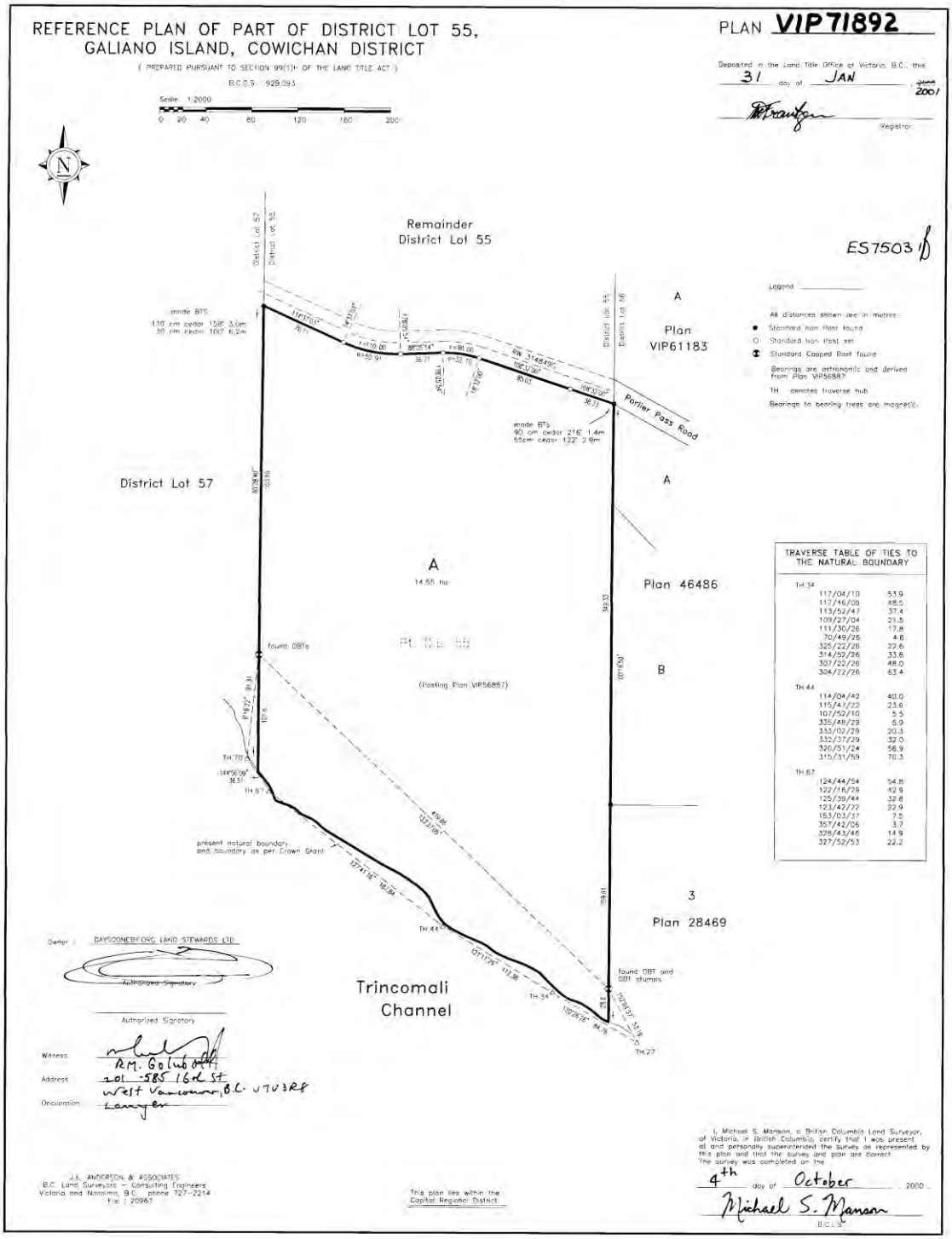
   *I can't remember if I have been given any terms of reference about my role. Perhaps, it would be good to review this.*

4. Would you like to continue being a warden for TNS? YES NO

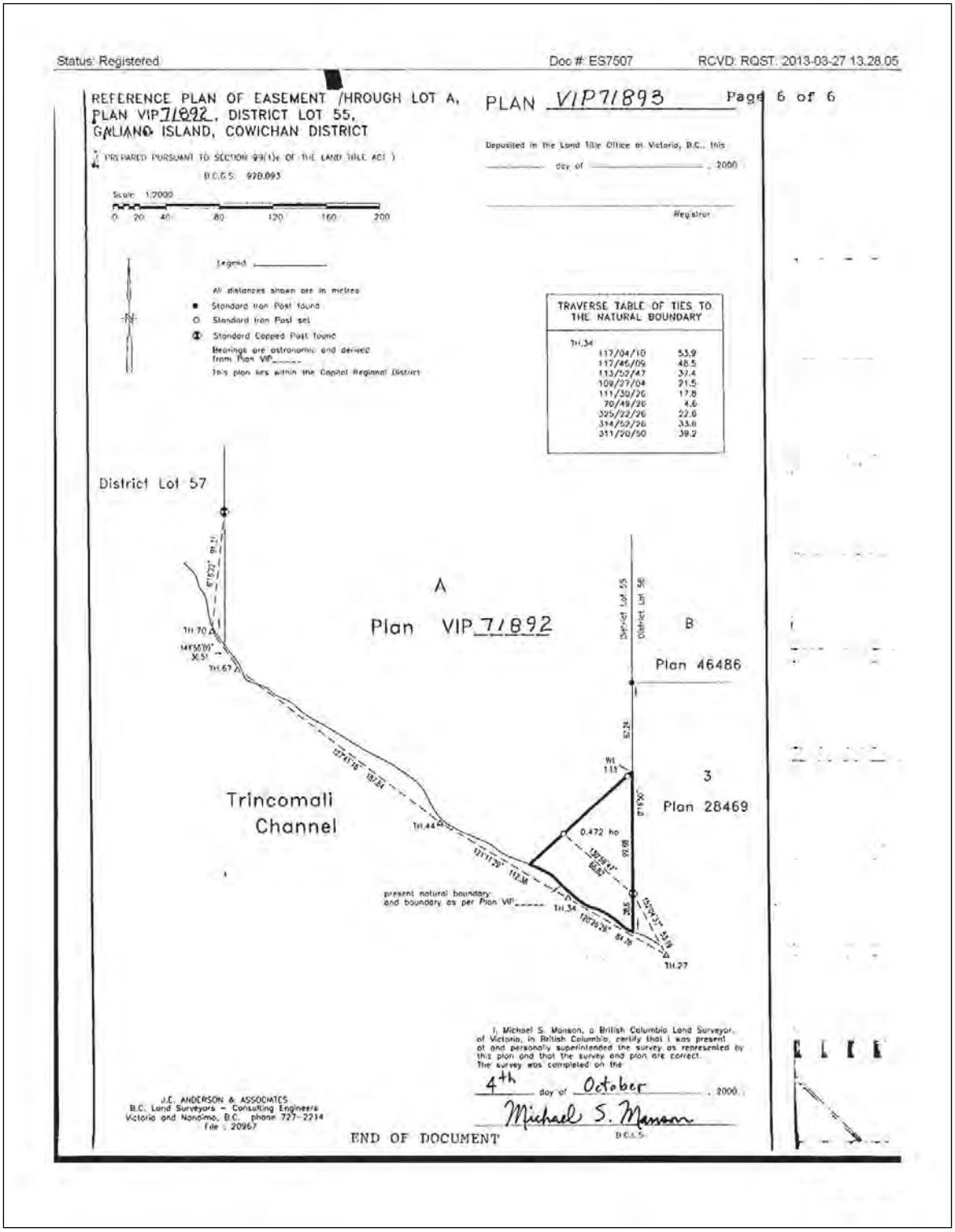
   *YES*

5. If you answered "no" to question #4, could you provide us with your reason?

# FIGURE 3
# Trincomali Nature Sanctuary
# Reference Plan



## FIGURE 4
## Reference Plan of Easement on Trincomali Nature Sanctuary



# APPENDIX 3
# PHOTOS

## PHOTO GROUP

## TNS Baseline Report
## 1999

**Wetland north of Porlier Pass Road**

**Spring south of Porlier Pass Road**

**Rock face turning perpendicular to waterfront**

**Scotch Broom on ridge at waterfront**

**Older forest on plateau near waterfront**

**Logging just south of Porlier Pass Road**

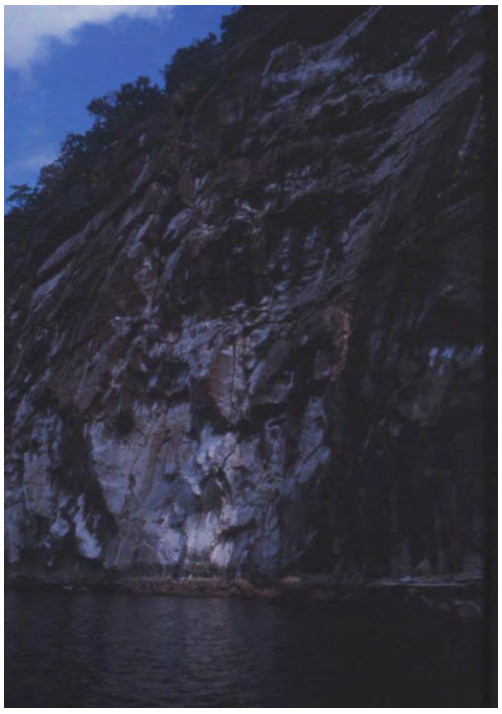
**Logging near central part of proposed protected area**

## PHOTO GROUP

## Site Field Visits
## 2000 – 2001

**Aerial view of coastal bluffs**

**Aerial view of coastal bluffs**



**View of coastal bluffs from water**

**Coastal Bluff/Woodland Ecosystem**

**Previously Logged Area**
**Second-growth Forest Ecosystem**


**Current sign at base of coastal bluff**

**Sign at end of spur logging road**

## PHOTO GROUP

## 2010-2013

**Bald Eagle Nest in Recently Logged Area - 2010**

**Scotch Broom burn scar in Recently Logged Area - 2012**

**Scotch Broom biomass Removal event 2012**

**Scotch Broom on Coastal Bluffs - 2012**

**Scotch Broom on Coastal Bluffs - 2012**

**Older Forest**
**2012**

**Woodland**
**2012**

**Recently Logged Area**
**2012**

**Trincomali Nature Sanctuary Sign in the Recently Logged Area**


**Closed Area Sign in the Recently Logged Area**


**Handmade No Trespassing Sign**

**Coastal Bluffs at eastern boundary line next to the residence fire looking down the bluffs**

**Coastal Bluffs at eastern boundary line next to the residence fire looking west**

**Residence fire remains, property adjacent to TNS**

# APPENDIX 4
# Reports on File
# Relevant to the Trincomali Nature Sanctuary

1. Conservation Covenant (2002)
2. Baseline Report (2002)
3. Restoration Reports (Scholz 2009 & 2010)
4. Management Reports (HAT 2011 & 2012)
5. Annual Monitoring Reports (HAT & ITF)

## END OF DOCUMENT