

SANDY BEACH NATURE RESERVE MANAGEMENT PLAN KEATS ISLAND, BC



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ISLANDS TRUST CONSERVANCY

i. Executive Summary

Islands Trust Conservancy (ITC) acknowledges and respects that Lhei'tínes/Keats Island is within the lands and waters of the Siwxwú7mesh Úxwumixw (Squamish Nation) and is the homeland and gathering place of many Coast Salish Peoples. The historical relationship to the land, culture, and spirit of this place continues to this day. ITC is committed to honouring the rich history of Indigenous stewardship in the lands and waters of the Islands Trust Area and to building mutually respectful relationships between Indigenous and non- Indigenous partners in conservation. Therefore, this Management Plan for Sandy Beach Nature Reserve is a living document that will evolve as opportunities for knowledge sharing arise and understanding grows¹.

Sandy Beach Nature Reserve (SBNR) is located at the southwestern end of Keats Island, one of the many islands in the Salish Sea. SBNR has experienced minimal human disturbance since the widespread logging of the coastal region in the 1900s. Its predominantly mature, coniferous forests blanket moderate to steep north- and north-facing slopes. The forests of the reserve provide habitat for many species of wildlife and plants, and with the unfragmented forests adjacent support an extensive greenway for wildlife movement.

Four provincially at risk ecological communities and several Sensitive Ecosystems occur in SBNR, a high diversity given its size. This community diversity also provides a high biodiversity of plant species, from those restricted to dry, nutrient poor soils of the coastal bluffs to ones requiring rich, moist soils on the eastern slopes. SBNR also has a significant number of old growth trees. There is suitable habitat for numerous wildlife species at risk.

This Management Plan assesses the current condition of SBNR, sets out conservation objectives, identifies ecological and/or cultural values, identifies relevant management issues and provides recommendations for the continued ecological health of SBNR. Recommendations include ensuring minimal human disturbance by interpretive signage, prohibiting motorized vehicles and bicycles, camping, and fires of any kind, improving the access to the beach for the public, removing invasive species, supporting or sponsoring additional ecological surveys to better manage and understand the qualities of SBNR, and monitoring for threats to the integrity of the reserve and its inherent features.

¹ First Nations/reconciliation content written by Lisa Wilcox, Islands Trust

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iii. Acknowledgements

Table 1. Acknowledgements: the primary author and other contributors to the management plan, their affiliations and professional qualifications.

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Alex Sartori	Owner, Sartori Environmental Services	Environmental assessment	Original Baseline Inventory Assessment of SBNR, 2018

1. Introduction

Lheí'tínes/Keats Island is situated within the territory of the Coast Salish Peoples, who share a rich history of stewardship in the lands and waters of the Islands Trust Area that inspires the work of Islands Trust Conservancy (ITC) and its partners.

Sandy Beach Nature Reserve (SBNR) is located at the northwestern end of Keats Island, an island in the Salish Sea. SBNR includes mature coniferous forests on north facing slopes, a narrow band of coastal bluff, and a sand beach interface with the ocean.

ITC will work in partnership with the Sunshine Coast Conservation Association (SCCA) and TLC The Land Conservancy of BC (TLC) to steward the care and management of SBNR to maintain and improve its ecological health and integrity.

1.1. Islands Trust Conservancy

Since time immemorial, the lands and waters between Vancouver Island and mainland British Columbia have been home to the Coast Salish People, whose ecological, cultural, and spiritual connections to this place continue to this day. In 1974, the Province of British Columbia recognized this region as a special place within the province where the unique beauty, cultural heritage, rural character, and diverse ecosystems should be protected for future generations. Through the *Islands Trust Act*, the province established the Islands Trust,

a special purpose government, with the following mandate (known as the Object of the Islands Trust):

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 cooperation with municipalities, regional districts, improvement districts, other persons and organizations and the government of British Columbia. (Islands Trust 2020a) Reference: <http://www.islandstrust.bc.ca/connect/about-us/>

In 1990, through the enactment of a section of the Islands Trust Act, the Province established the Islands Trust Fund, now called the Islands Trust Conservancy (ITC), as a conservation land trust to assist in carrying out the “preserve and protect” mandate. Part 6 of the Islands Trust Act establishes the corporate status, responsibilities, and governance structure of the Islands Trust Conservancy. The Board of ITC is one of the sixteen corporate entities² charged to uphold the Object of the Islands Trust. Since 1990, ITC has protected over 1,300 hectares (3,220 acres) of land as nature reserves and conservation covenants.

The vision of ITC is for a network of protected areas that preserve in perpetuity the natural systems of the islands in the Salish Sea. The mission of ITC is to protect special places by encouraging, undertaking, and assisting in voluntary conservation initiatives within the Islands Trust Area. ITC nature reserves are managed to maintain, preserve, and protect the natural features and values of ecosystems.

1.2. Purpose of Islands Trust Conservancy Management Plans

ITC management plans provide background information and set out the direction of property management as follows:

- Provide general and descriptive information on the property, including location, history, and land use.
- Set out the conservation goals and objectives for the property.
- Identify the ecological and/or cultural values and features of the property.
- Describe the management issues associated with the property.
- Provide short-, medium- and long-term management recommendations (action items or tasks) on issues such as species at risk protection, ecological restoration, public access, educational and research opportunities, invasive species management, and signage needs.
- Preserve and protect cultural, spiritual, and sacred locations.

Once the management plan process is completed, ITC works to carry out the management actions or strategies identified in the plan, as resources allow. Following general practice, ITC revises the Management Plan every ten years.

1.3. The Scope of Islands Trust Conservancy Management Plans

² The corporate entities charged to uphold the Object of the Islands Trust are the Trust Council, the Executive Committee, twelve local trust committees, one island municipality, and the Islands Trust Conservancy Board.

Consistent with the Islands Trust Reconciliation Declaration (Islands Trust 2020b), ITC recognizes that nature reserves may be places of great cultural and spiritual significance to First Nations. Cooperative management of these protected places will provide opportunities to establish and maintain mutually respectful relationships between Islands Trust Conservancy and First Nations, as well as upholding the guiding principles of United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)³ and the Truth and Reconciliation (TRC) Calls to Action. Relationship-building, knowledge-sharing, healing, and establishment of trust take time. Islands Trust Conservancy is committed to developing a parallel *Management Plan for Areas of Cultural Heritage and Sacred Significance*. This parallel Management Plan sets out guiding principles for cooperative collaboration between ITC and First Nations with traditional and treaty territories and cultural interests in the area defined by one or more nature reserve. Moreover, the Management Plan defines the common vision, objectives, policies, and best management practices for the nature reserve(s) to ensure that its natural values and cultural heritage and sacred significance are maintained for future generations.

1.4. Protected Area Purpose

The purpose of protecting the land and features of SBNR is:

- To protect the natural ecosystems and natural values of the site
- To preserve cultural and archaeological features
- To maintain the biodiversity of the site for the benefit of the flora and fauna, Keats Island residents, local First Nations, the public and the province.

1.5. Protected Area Objectives

The objectives in protecting SBNR are to:

- Preserve and protect the natural ecosystems, biological diversity and natural values.
- Support and protect continued use of areas of sacred and cultural significance by First Nations, as per Section 35 of the Constitution Act⁴ and UNDRIP;
- Restore plant and animal communities and ecological process if necessary and feasible;
- Support ongoing inventory, mapping and monitoring to guide management.
- Allow natural forest succession and natural ecological processes and functions to proceed unimpeded, except in the case of wildfire; and
- Remove invasive species throughout the reserve.

³ The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is an international instrument adopted by the United Nations on September 13, 2007, to enshrine (according to Article 43) the rights that “constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world.” The UNDRIP protects collective rights that may not be addressed in other human rights charters that emphasize individual rights, and it also safeguards the individual rights of Indigenous people. Canada signed in 2010.

⁴ Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

2. Property Information

SBNR is 3.55 hectares (8.77 acres) in size. It is irregular in shape but largely rectangular and oriented east to west. It has approximately 353 metres of waterfront.

2.1. Location

Keats Island is located at the mouth of Howe Sound (Fig. 1). SBNR is located on the southwestern portion of Keats Island, oriented roughly west to east for its length (Fig. 2). SBNR is in the Gambier Island Local Trust Area and the Sunshine Coast Regional District.

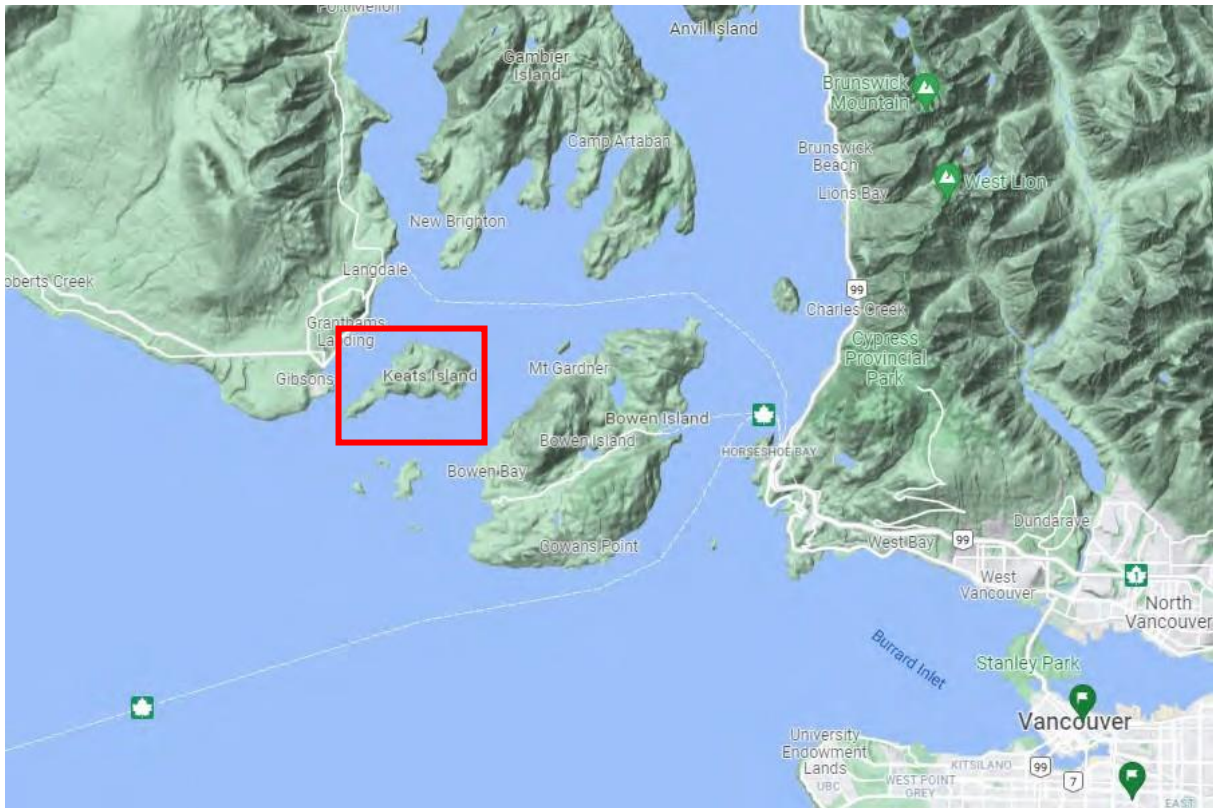


Figure 1. Map showing the larger geographical context of Keats Island (red box), located at the mouth of Howe Sound.

2.2. Legal description

The legal description of SBNR is Lot 1 of Subdivision Plan EPP89532, Keats Island, BC. The PID number is 031-259-731. There is no civic address associated with SBNR. A land survey sketch is found in Figure 3.



Figure 2. Location of SBNR at the southwestern end of Keats Island, BC.

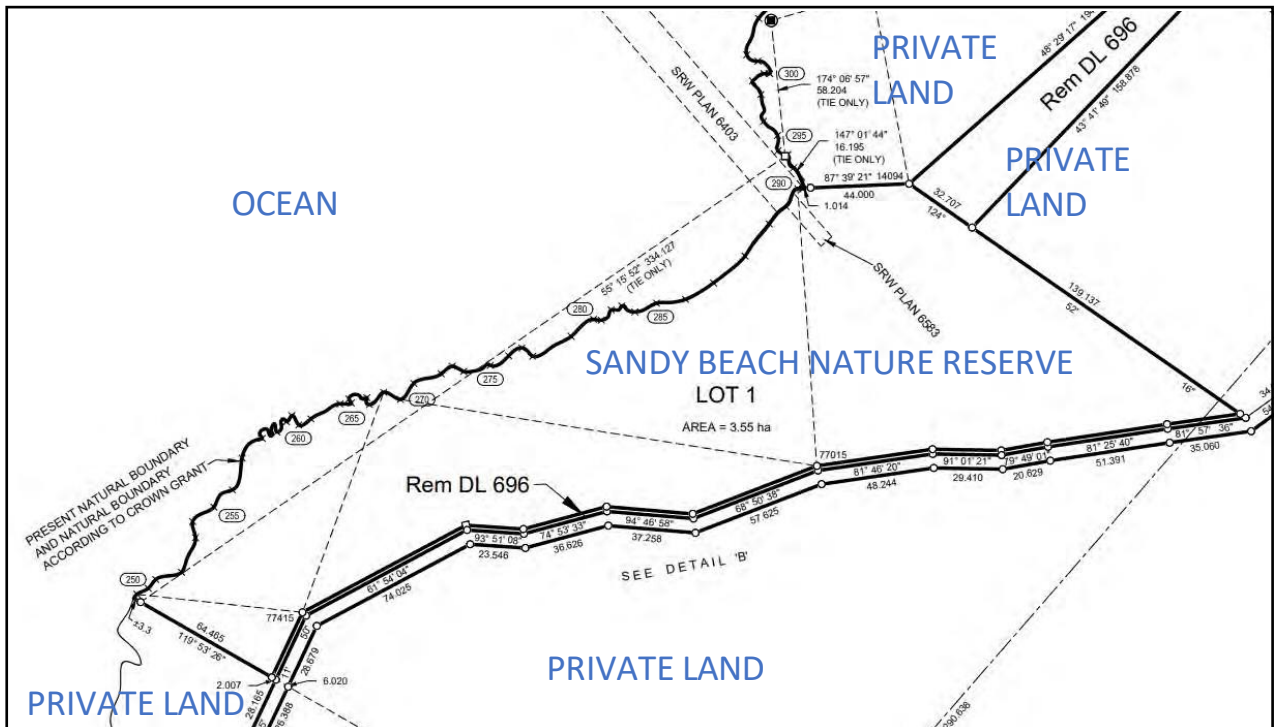


Figure 3. Land survey sketch of SBNR, designated as Lot 1.

2.3. Legal Access

Legal access to SBNR is on foot via Salmon Rock Trail which begins near Keats Landing, serviced by BC Ferries from Langdale.

2.4. Landscape Context

Keats Island is within lands and waters of the Siwxwú7mesh Úxwumixw (Squamish Nation) and is the homeland and gathering place of many Coast Salish Peoples. Lhe'ítines/Keats Island is a place of cultural significance and is the location of village sites, archaeological areas, and occupation since time immemorial.

SBNR is roughly rectangular in shape, with its northern boundary fronting Shoal Channel near the mouth of Howe Sound. The landscape context of SBNR is rated very highly, as surrounding the reserve are intact second growth, mature forests (Fig. 4). There is no development currently south of SBNR. The southwestern tip of Keats Island is held as Private Conservation (see Figure 5). The lands adjacent to the southern and eastern boundaries of SBNR are held by the Convention of Baptist Churches of BC, who provided the land now known as SBNR as part of an application for subdivision and rezoning on their other holdings. Adjacent to the northeast corner of the property are private cottages with some tree cover.

While SBNR is buffered from disturbance from surrounding areas of natural cover, if development occurs nearby on neighbouring lots, it could pose a threat to the integrity of the nature reserve.

There are several protected areas on Keats Island, including Plumper Cove Marine Provincial Park (Fig. 6).

2.5 Site History

Lands and waters including Keats Island were occupied and used by First Nations for settlements, resource gathering, and as spiritual and ritual places. Villages, hunting camps, cedar bark gathering areas, rock quarries, clam and fish processing camps, pictographs and cemeteries are examples of the many ways that First Nations have used and depended on the coast and lands for time immemorial.

“The Skw xwú7mesh (Squamish) people have a long interconnected history with Lhek'tines (also known as Keats' Island). The island is laden with place names and areas of cultural significance that remind us, as Skw xwú7mesh, who we are and how the island provided for our people since the beginning of creation. We relied on the aquatic and terrestrial resources of the island to maintain our culture and way of life. The Nation looks forward to continuing our relationship with the Islands Trust Conservancy to ensure that we are protecting both our environment and Skw xw ú7mesh connections to the land and the resources.”

– Syeta'xtn (Chris Lewis), Spokesperson and Councillor of Squamish Nation

Euro-Canadian colonization of Keats Island occurred in 1887. Original old-growth forests on

the island were almost completely logged early in the 1900s, and a small sawmill operated on Keats. No evidence of other resource extraction was found in SBNR.

SBNR was formerly part of Keats Camps, a Baptist summer camp founded in 1926 and operated by the Convention of Baptist Churches of British Columbia. Through a rezoning and subdivision application process, ITC became the landholder of SBNR in December, 2020.



Figure 4. Map of landscape context of the Sandy Beach Nature Reserve, Keats Island, BC. Lot lines are also displayed.

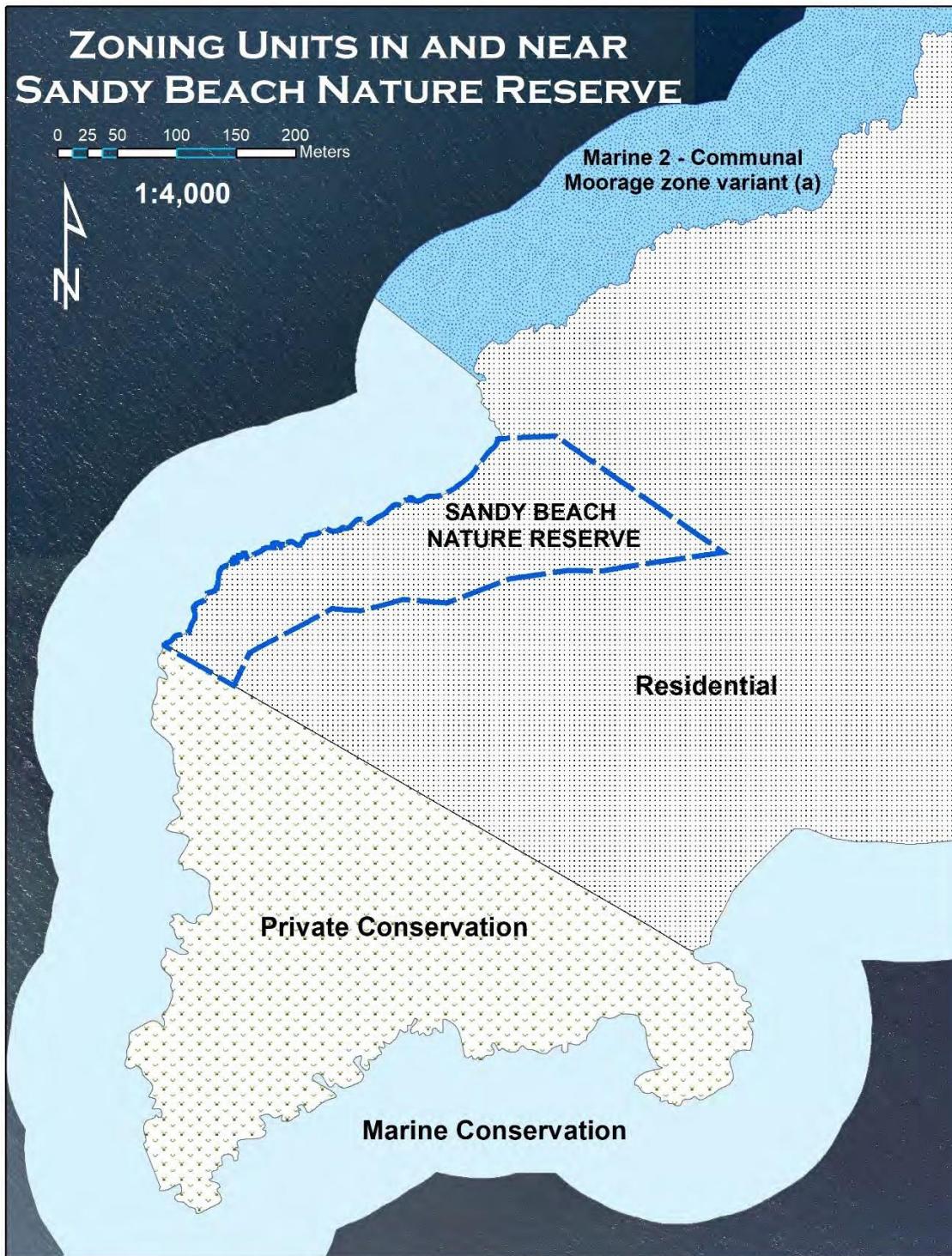


Figure 5. Map of zoning in the vicinity of SBNR. The nature reserve falls within the Comprehensive Development 2 category of Residential Zoning. Map created January 2022.



Figure 6. Protected areas on Keats Island: Provincial Park (triangle), Provincial Submerged Marine Park (star), Community Parks (circles) and the Sandy Beach Nature Reserve. Map created January 2022.

2.6 Anthropogenic Features

Anthropogenic features of a non-indigenous nature are described in Table 2 and are mapped in Figure 7.

Table 2. Non-Indigenous anthropogenic features of SBNR.

Anthropogenic Feature	Description	Condition	Photo point Location
Trails	Walking trail to access beach & connector trail for cottage residents	0.5-1m wide, surface material is bare earth	See Fig. 7 for location; 605, 606
Hydro pole & lines	Tall, 30 cm diameter pole for electricity wires connecting Keats to Langdale	In good condition, relatively new	614, 622
Signpost	On Salmon Rock Trail, indicating the start of Sandy Beach Trail	Weathered, not prominent	604
Signpost	Outside of SBNR, for residents; indicates private stairs to beach and Sandy Beach Trail	Fair	616
Signs	Small signs erected by Keats Camp, one on hydro pole at beach and one on tree at beach indicating no fires or camping	Sign on hydro pole is in good condition; sign on tree overhanging beach is in poor condition	622
Property pins	Marking boundaries	Relatively new white, wooden stakes	610, 631, 645
Water line/hose	Black rubber hose line	Purpose and condition unknown	628, 646

2.7 Undersurface Rights

Undersurface rights of two Statutory Rights of Way are held by BC Hydro (see section 2.8). There are no known holders of undersurface rights for the remainder of SBNR.

2.8 Notations, Charges, Liens and Interests

The title of the SBNR land is encumbered by two Statutory Rights of Way, Plan 6403 and 6583 (Fig. 8). They are held by BC Hydro and were placed upon the title in 1961, for the transmission and distribution of electric energy and communication purposes from the Sunshine Coast to Keats Island.

The current charges allow BC Hydro to construct, erect, string, operate, maintain, remove and replace tower and poles with anchors, guy wires, brackets, cross-arms, insulators, transformers and one or more lines of wires. Similar rights are allowed for underground conduits and cables. The SRW also allows BC Hydro to use such portion of the land alongside

the right of way as may be reasonable for works needed, to clear the ROW of trees and other vegetation, and to trim or cut down trees outside the ROW that are deemed by BC Hydro to be, or potentially be, dangerous to their structures or works. The SRW documents also allow BC Hydro to access the ROW across neighbouring land, including the right to construct, maintain and use on the land any road or roads reasonably required.

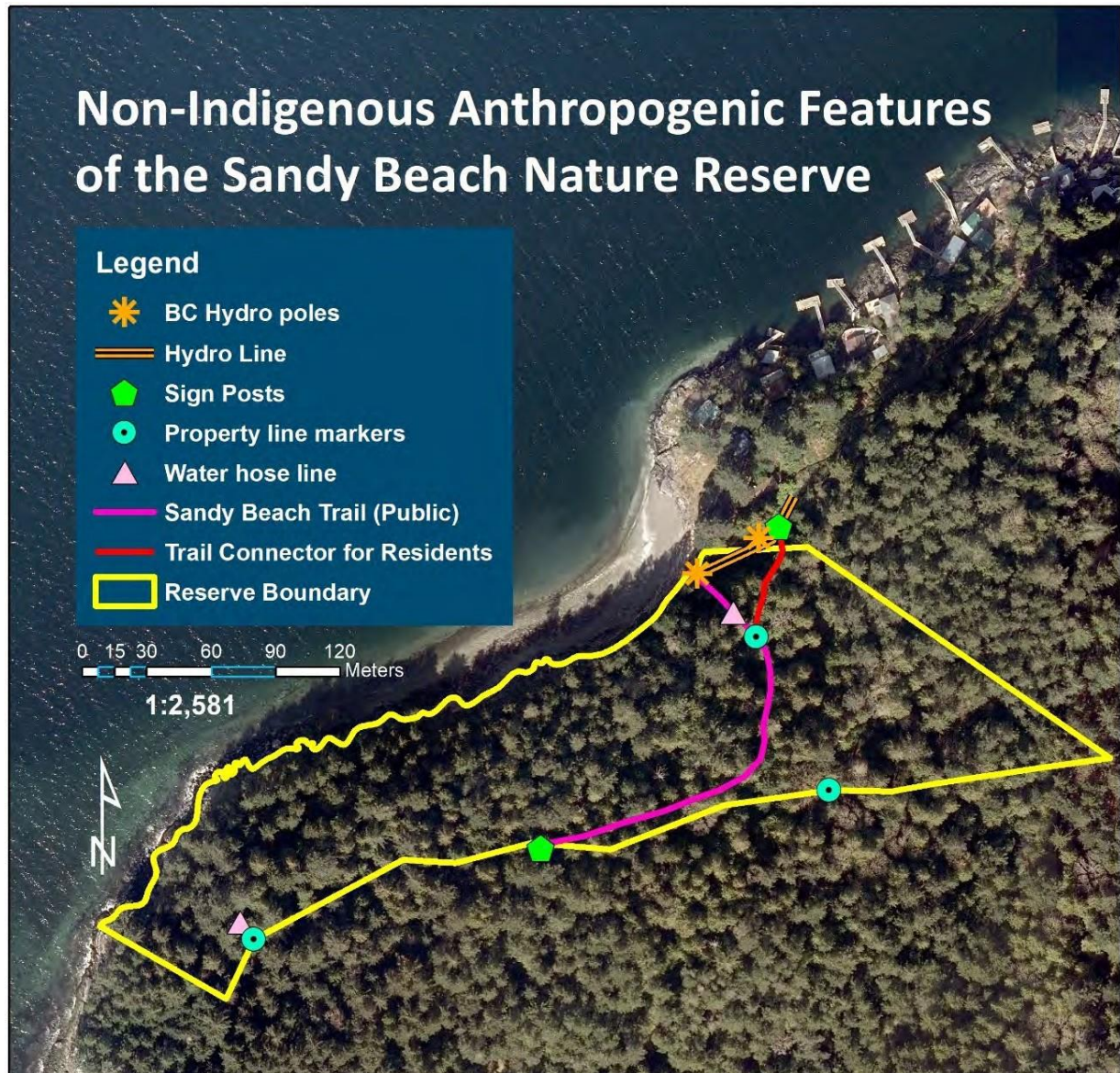


Figure 7. Non-indigenous anthropogenic features observed in SBNR. Map created in January 2022. Note: not all property pins were observed and recorded.

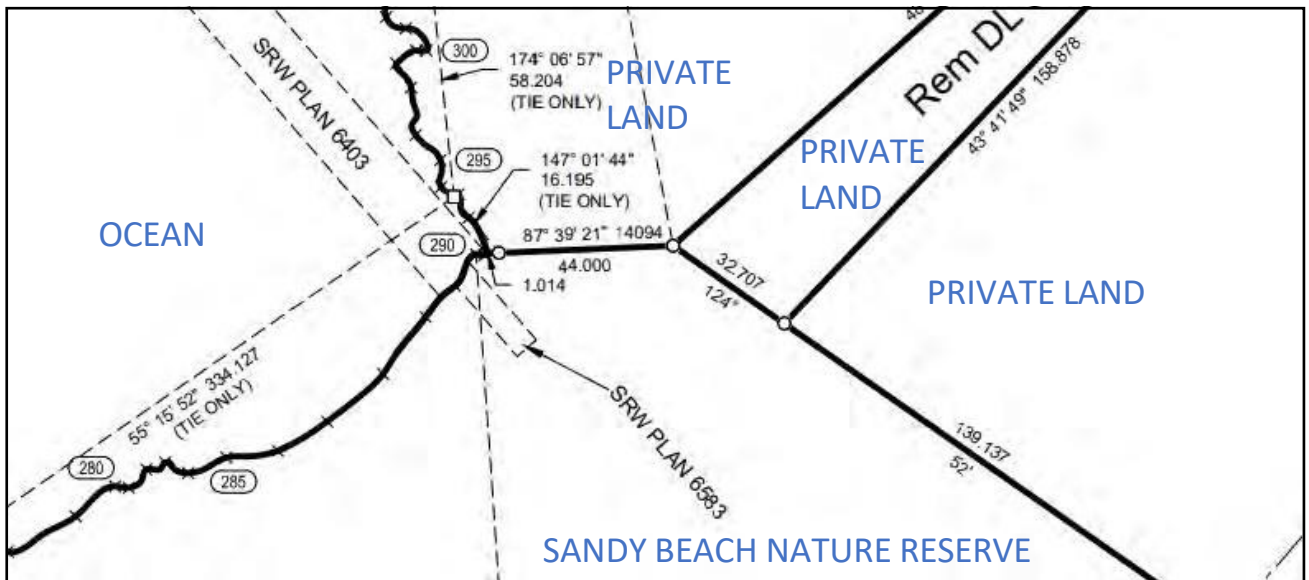


Figure 8. Detailed view of the northern end of SBNR, showing the two SRWs on title, Plans 6403 and 6583.

2.9 Local Planning Designations

SBNR is zoned as Residential. There are no Development Permit Areas (DPAs) or Riparian Area Regulation (RAR) areas in or near SBNR.

2.10 Existing Public and Other Use

Residents of the land held by the Convention of Baptist Churches of BC and guests to its camps have visited the SBNR area for many decades. Other residents and visitors to Keats Island have also been able to access the land. Kayakers pull up on the beach periodically.

BC Hydro holds two SWRs associated with SBNR (see section 2.8 for details).

3 Inventory by Ecological Community⁴

ITC acknowledges that there is a wealth of Traditional Ecological Knowledge and a long history of ecosystem stewardship among the First Nations whose territory encompasses Inner Island Nature Reserve. ITC will strive to work with First Nations knowledge holders to deepen its understanding, improve its stewardship practices, and, ultimately, support the transfer of Traditional Ecological Knowledge to younger generations within First Nations communities to ensure that it is not lost. At this time, the ecological information presented in this management plan was formed using systems that are based in foundations of Western science.

⁴ Ecological communities are used by the B.C. Conservation Data Centre and NatureServe to describe both forested and non-forested natural areas. More information about ecological communities, including descriptions of ecological communities in the Islands Trust Area, can be found on the B.C. Conservation Data Centre website.

3.1 Ecological Significance

SBNR is predominantly a north-facing, forested hillside with a mix of gentle, moderate and extremely steep slopes. It fronts the ocean for approximately 353 metres and has a beach with sand substrate for almost half its length. Undisturbed land that protects the interface between terrestrial and marine habitats is extremely important ecologically. The natural cover of the terrestrial portion promotes the health of the intertidal and deeper marine zones offshore. Sand deposits are also uncommon in the region. ITC has mapped (Fig. 9) suitable forage fish spawning habitat along the Sandy Beach for Surf Smelt (*Hypomesus pretiosus*) and Pacific Sand Lance (*Ammodytes hexapterus*). Patches of offshore eel-grass have also been mapped (Fig. 9). Common eel-grass (*Zostera marina*) is the native eel-grass species found on the BC coast.



Figure 9. Suitable forage fish spawning habitat (both for Surf Smelt and Pacific Sand Lance) occurs along Sandy Beach (red and orange line). Dots offshore represent the presence of eel-grass (MapIT, accessed January 2022).

A thin band of coastal bluff vegetation occurs just above the high tide line along a portion of the waterfront. Large slabs of exposed bedrock are colonized by characteristic mosses and lichens of coastal bluffs, and shore pine (*Pinus contorta* var. *contorta*) is present. Coastal bluffs are comprised of Sensitive Ecosystems (e.g. Coastal Herbaceous, Woodland) which are highly vulnerable to disturbances such as trampling and weedy species infestations. The coastal bluff habitat in SBNR is relatively small but has good ecological integrity as it is largely inaccessible to human foot traffic due to its steepness and has remained high in native species. A map of the ecological communities is found in Figure 10.



Figure 10. Ecological communities present in SBNR. See Section 3.7 for vegetation descriptions. Structural Stage (ST) 6 represents mature forest; ST2 represents herbaceous vegetation with less than 10% tree cover. Map created January 2022.

Four (4) provincially at risk ecological communities occur in SBNR (Table 3). Three are red-listed forest communities and one is a blue-listed coastal bluff community.

The forests are high-quality, mature second growth, with a high number of old-growth trees (Fig. 11). These veteran trees pre-date Euro-Canadian colonization and escaped the ensuing lumber resource extraction on the South Coast of BC.

Table 3. Provincially at risk ecological communities in SBNR.

Ecological Community Name		Site Series	Status		
English	Scientific		Provincial	BC List	Global
Western hemlock – Douglas-fir / Oregon beaked-moss	<i>Tsuga heterophylla</i> – <i>Pseudotsuga menziesii</i> / <i>Eurhynchium oregonum</i>	CWHxm1/01	S2 (2013)	Red	G3G4
Western red-cedar / sword fern	<i>Thuja plicata</i> / <i>Polystichum munitum</i>	CWHxm1/05	S1S2 (2021)	Red	GNR
Wallace’s selaginella / reindeer lichens	<i>Selaginella wallacei</i> / <i>Cladina</i> spp.	CWHxm1/00	S3 (2012)	Blue	GNR
Douglas-fir – western hemlock / salal Dry Maritime	<i>Pseudotsuga menziesii</i> – <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i> Dry Maritime	CWHxm1/03	S2 (2019)	Red	G3G4



Figure 11. Veteran trees and Wildlife Trees (or snags) observed in SBNR. Map created January 2022.



Photos 1-3. An old standing snag of bigleaf maple (top left) with peeling bark provides foraging opportunities for wildlife, particularly woodpeckers; a large Douglas-fir vet with fire scars (top right); a Douglas-fir old growth tree with evidence of woodpecker activity (lower photo).

3.2 Climate

SBNR and Keats Island fall within the Georgia Depression Ecoprovince, Lower Mainland Ecoregion and Georgia Lowland Ecoregion. It is within the eastern variant of the Very Dry Maritime subzone of the Coastal Western Hemlock zone (CWHxm1). This subzone variant has a mean annual temperature of 9.3°C, and a mean warmest month temperature of 17°C. The mean temperature of the coldest month is 2.4°C. CWHxm1 receives a mean annual precipitation of 1427 mm, with the mean summer precipitation of 285 mm (Centre for Forest Conservation Genetics, accessed 2022).

Graphs of average temperature and precipitation through the year from nearby Gibson's weather station are provided in Figures 12 and 13.

Figure 12. Average monthly temperature of nearby Gibsons calculated using 21 years of climate data (www.weatherbase.com).

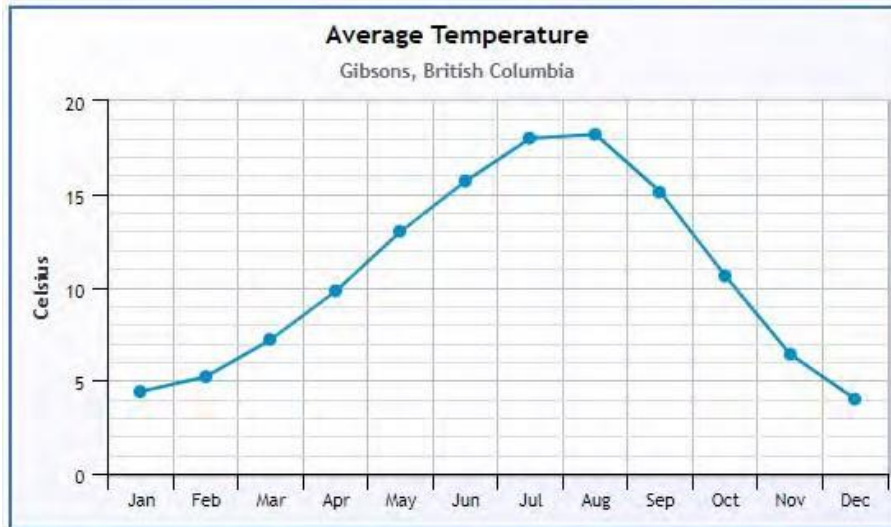
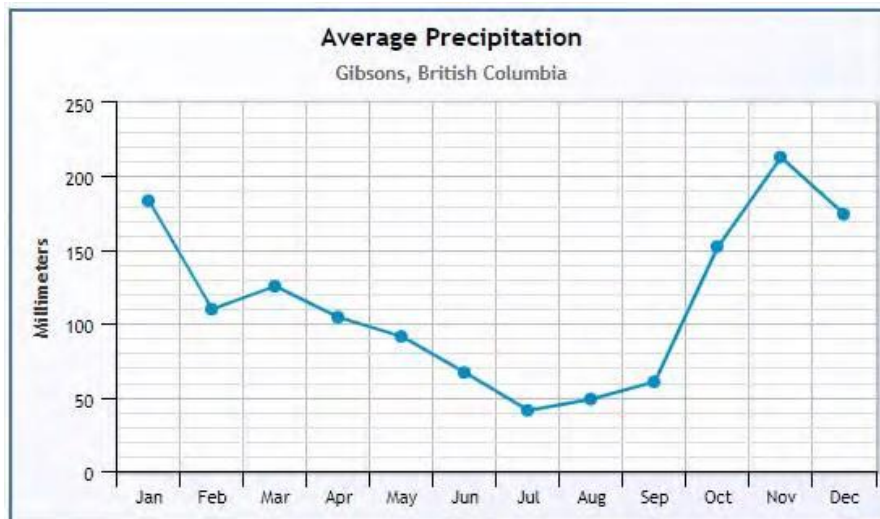


Figure 13. Average monthly precipitation of nearby Gibsons calculated using 21 years of climate data (www.weatherbase.com).



With climate change, Keats Island will experience hotter and drier conditions during the growing season. Predictions of winter conditions are variable, but increased storm frequency and heavier precipitation amounts are likely.

3.3 Geology and Physiology

Keats Island is primarily comprised of sloping terrain rising to a central ridge or peak. Its rock dominated topography is characterized by frequent bedrock outcrops or shallow overburden over bedrock (Johanson 1993). The bedrock geology of the island is comprised of metamorphosed volcanic and lesser interbedded sedimentary rocks of the Bowen Island Group, along with Coast Plutonic granitic rocks at the east and west ends (Johanson 1993), where SBNR is located.

SBNR encompasses mostly northwest facing slopes of moderate to steep grade (Fig. 14). Along the shoreline are rock outcrops which support coastal bluff ecosystems. The interface with ocean is a gradually sloping sand beach, which is largely underwater during high tides but prominent during low tides.

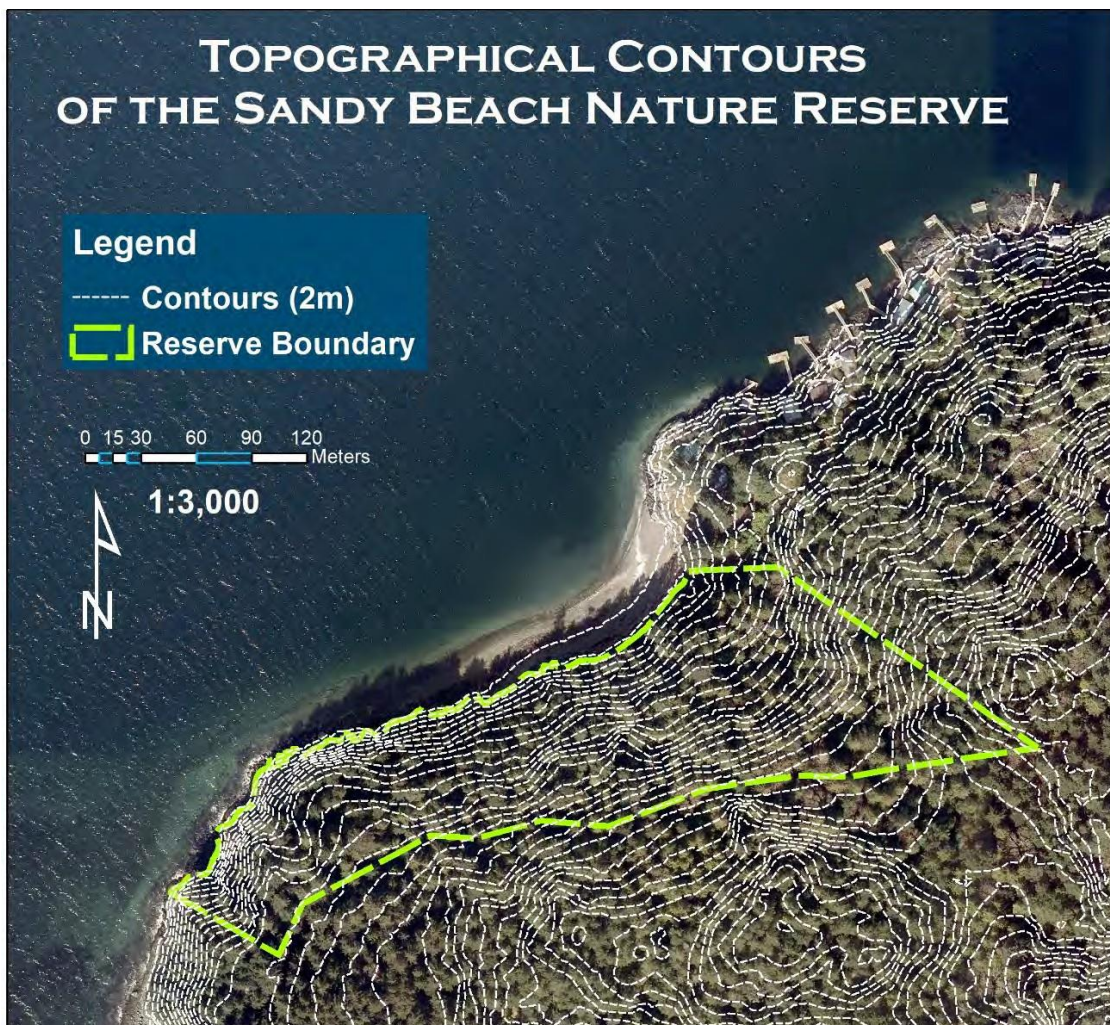


Figure 14. Terrain and physiology of SBNR and the surrounding area, showing 2 m interval contours.

3.4 Hydrology

There are no significant hydrological features in SBNR, although there may be intermittent drainage channels during very wet weather events.

3.5 Soils

The soils of SBNR and surrounding slopes are typically 60% Bose soils, which are classified as moderately well-drained loamy sand, with approximately 40% in coarse fragments. Cannel soils account for 40% of the soils of the area and are well-drained loam soils with 20% coarse fragments (iMap, accessed Jan. 2022; BC Soil Finder Tool, accessed Jan. 2022).

3.6 Ecological Classifications

Keats Island and SBNR occur within the eastern variant of the Very Dry Maritime Coastal Western Hemlock biogeoclimatic subzone (CWHxm1). This subzone is the second mildest in Canada, with warm, dry summers and mild, wet winters. Vegetation communities are differentiated by available soil moisture, depth, and nutrient status (Green and Klinka 1994). Climatic factors, in conjunction with existing soil conditions, result in a nutrient poor forest with a long growing season, although water deficits may occur on zonal sites. Ecosystems of CWHxm1 experience infrequent stand-initiating events (e.g. they are not fire-dependent).

3.7 Ecological Communities and Site Series

In addition to the data collected for the original baseline report for SBNR, ecological data was collected during site visits on September 24, 2021, and January 27, 2022. Note that this was not the optimum time of year to observe all flora on site, so species lists were supplemented with original baseline data. Species lists should be considered partial only; this is particularly true of the dry coastal bluff communities where numerous plant species are only evident during the spring season.

Tables of representative species observed, community descriptions and other features of the ecological communities mapped in SBNR are found below. Site series were identified using *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Green and Klinka 1994). Structural stage was accorded based on definitions in *Standards for Terrestrial Ecosystems Mapping in British Columbia* (RIC 1998). Locations of photo points and other photograph locations are given in Appendix E.

Ecological Community: Western red-cedar / sword fern Very Dry Maritime

Table 4. Mature Western red-cedar / sword fern Very Dry Maritime ecological community overview.

Ecological Community	Western red-cedar / sword fern Very Dry Maritime <i>Thuja plicata</i> / <i>Polystichum munitum</i> Very Dry Maritime
Classification	CWHxm1/05
Structural Stage	6 (mature)
Status (BC List)	Red
Photo point	1
Ecological Community Description	Characterized by soils with a richer than average soil nutrient regime. Some areas were also moister than average. Indicator moss species and a high cover of sword fern are associated with rich, moist soils. Numerous veteran trees.
Disturbance Notes	Past selective logging; small population locations of invasive species; water line; walking trail
Anticipated Change/Succession	Barring significant disturbance (natural or anthropogenic), the forest community is expected to continue to mature to a climax state. Douglas-fir will likely be succeeded by an increase in western hemlock.
Wildlife Observations	None observed on January 27, 2022



Photo 4. Representative photo of the ecological community Western red-cedar / sword fern Very Dry Maritime (Photo Point 1, App. D).

Table 5. Mature Western red-cedar / sword fern Very Dry Maritime vegetation composition.

VEGETATION SPECIES	PERCENT COVER (%)						NOTES
	Main Canopy*	Secondary Canopy+	Shrub Layer**	Herb Layer++	Moss, Lichen Layer*+	Non-natives ^	
<i>Pseudotsuga menziesii</i> (Douglas-fir)	20						
<i>Thuja plicata</i> (western redcedar)	40	5					
<i>Tsuga heterophylla</i> (western hemlock)		1	T				
<i>Gaultheria shallon</i> (salal)			10				
<i>Berberis nervosa</i> (dull Oregon-grape)			0.1				
<i>Rubus parviflora</i> (red huckleberry)			0.1				
<i>Polystichum munitum</i> (sword fern)				80			
<i>Dryopteris expansa</i> (spiny wood fern)				0.1			
<i>Blechnum spicant</i> (deer fern)				T			
<i>Eurhynchium oreganum</i> (Oregon beaked-moss)					2		
<i>Hylocomnium splendens</i> (step moss)					10		
<i>Pleurozium schreberi</i> (red-stemmed feathermoss)					20		
<i>Plagiomnium insigne</i> (coastal leafy moss)					0.1		
<i>Eurhynchium praelongum</i> (slender beaked-moss)					0.1		
<i>Hedera helix</i> (English ivy)						T	
<i>Ilex aquilifolium</i> (English holly)						T	
<i>Daphne</i> sp.						T	
Cover by Layer (%)	60	6	10	80	32	T	Total Canopy Cover: 60%

*Codominant trees, main layer of tree cover.

+Trees greater than 10m that do not reach the main canopy.

**All woody plants less than 10m tall.

++All herbaceous species, regardless of height and some low woody plants less than 15cm tall when fully grown.

*+ All bryophytes, terrestrial lichens and liverworts.

T stands for Trace or less than 1%

Ecological Community: Western hemlock – Douglas-fir / Oregon beaked-moss

Table 6. Mature Western hemlock – Douglas-fir / Oregon beaked-moss Ecological Community Overview.

Ecological Community	Western hemlock – Douglas-fir / Oregon beaked-moss <i>Tsuga heterophylla</i> – <i>Pseudotsuga menziesii</i> / <i>Eurhynchium oreganum</i>
Classification	CWHxm1/01
Structural Stage	6 (mature)
Status (BC List)	Red
Photo point	2
Ecological Community Description	The zonal forest type given the climate of the subzone and typical soils (average moisture and nutrient regimes). Usually found on level or gently sloping terrain. Found in SBNR on undulating terrain and some gentle to moderate north-facing slopes. Understorey is patchy and relatively sparse. Dominated by salal with few herbaceous species. Numerous veteran trees.
Disturbance Notes	Past selective logging; small population locations of invasive species; water line; walking trail
Anticipated Change/Succession	Barring significant disturbance (natural or anthropogenic), the forest community is expected to continue to mature to a climax state.
Wildlife Observations	None observed on January 27, 2022

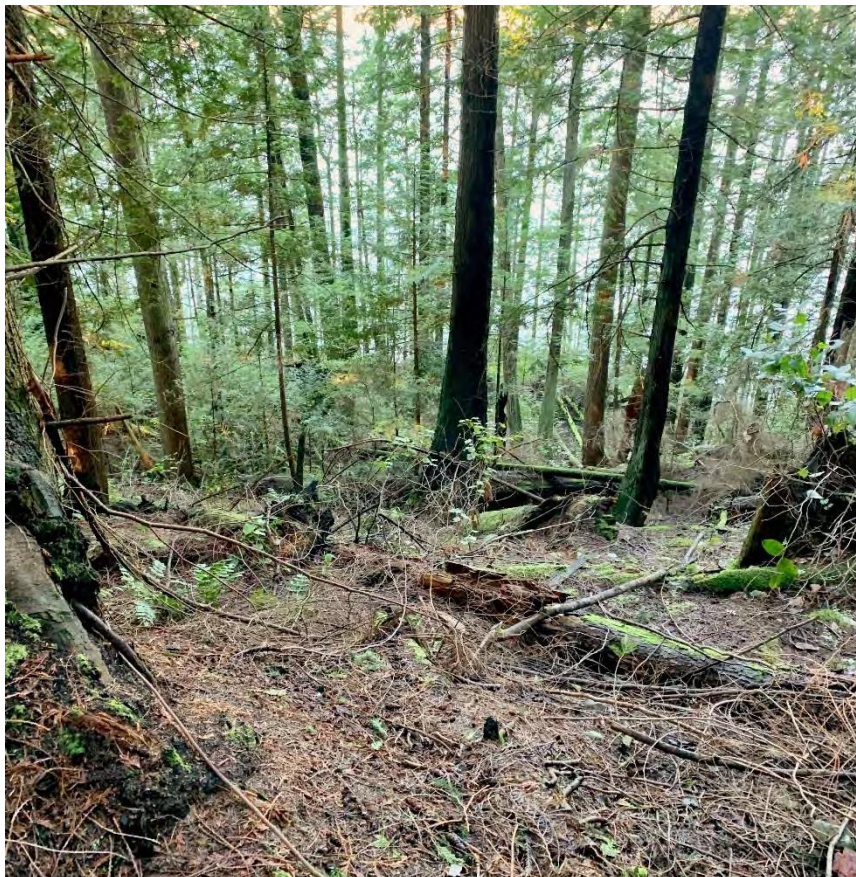


Photo 5. Representative photo of the ecological community Western hemlock – Douglas-fir / Oregon beaked-moss (Photo Point 2, App. D).

Table 7. Mature Western hemlock – Douglas-fir / Oregon beaked-moss Vegetation Composition.

VEGETATION SPECIES	PERCENT COVER (%)						NOTES
	Main Canopy*	Secondary Canopy+	Shrub Layer**	Herb Layer++	Moss, Lichen Layer*+	Non-natives^	
<i>Pseudotsuga menziesii</i> (Douglas-fir)	25						
<i>Thuja plicata</i> (western redcedar)	25	25	9				
<i>Tsuga heterophylla</i> (Western hemlock)		1	T				
<i>Gaultheria shallon</i> (salal)			40				
<i>Berberis nervosa</i> (dull Oregon-grape)			3				
<i>Rubus parvifolium</i> (red huckleberry)			0.1				
<i>Rubus ursinus</i> (trailing blackberry)			T				
<i>Polystichum munitum</i> (sword fern)				3			
<i>Geranium robertianum</i> (Robert's geranium)						T	
<i>Eurhynchium oregonum</i> (Oregon beaked-moss)					5		
<i>Eurhynchium praelongum</i> (slender beaked-moss)					0.1		
<i>Hedera helix</i> (English ivy)						T	
<i>Ilex aquilifolium</i> (English holly)						T	
<i>Rubus discolor</i> (Himalayan blackberry)						T	
Cover by Layer (%)	50	26	50	3	5		Total Canopy Cover: 65%

*Codominant trees, main layer of tree cover.

+Trees greater than 10m that do not reach the main canopy.

**All woody plants less than 10m tall.

++All herbaceous species, regardless of height and some low woody plants less than 15cm tall when fully grown.

*+ All bryophytes, terrestrial lichens and liverworts.

T stands for Trace or less than 1%

Ecological Community: Wallace’s selaginella / reindeer lichens

Table 8. Wallace’s selaginella / reindeer lichens Ecological Community Overview.

Ecological Community	Wallace’s selaginella / reindeer lichens <i>Selaginella wallacei</i> / <i>Cladina</i> spp.
Classification	CWHxm1/00
Structural Stage	2 (herbaceous)
Status (BC List)	Blue
Photo point	3
Ecological Community Description	Occurs in SBNR as a thin band above the high tide line for a portion of the beach zone. Scattered trees of Douglas-fir and shore pine. Little or no surface soil. Classified as herbaceous but predominantly vegetated by mosses and lichens.
Disturbance Notes	Past selective logging; small population locations of invasive species; water line; walking trail
Anticipated Change/Succession	Barring significant disturbance (natural or anthropogenic), the forest community is expected to continue to mature to a climax state.
Wildlife Observations	None observed on January 27, 2022

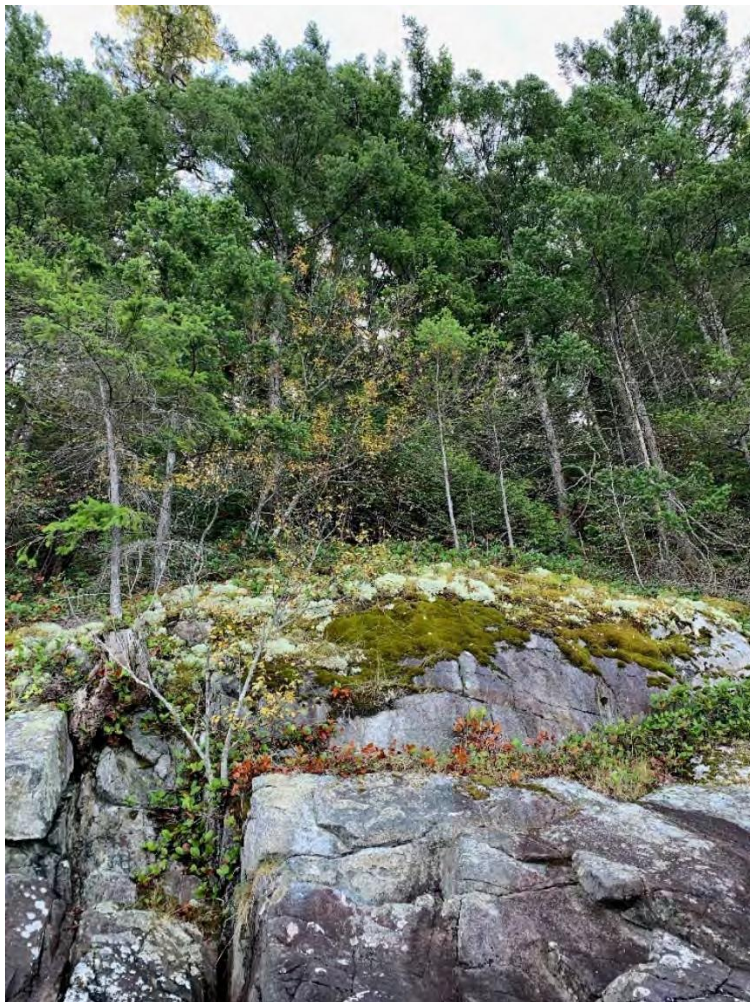


Photo 6. Representative photo of the ecological community Wallace’s selaginella / reindeer lichens along a narrow band above the beach (Photo Point 3, App. D).

Table 9. Wallace’s selaginella / reindeer lichens Vegetation Composition, modified from the original ecological inventory (Sartori 2018).

VEGETATION SPECIES	PERCENT COVER (%)						NOTES
	Main Canopy*	Secondary Canopy+	Shrub Layer**	Herb Layer++	Moss, Lichen Layer*+	Non-natives ^	
<i>Thuja plicata</i> (western redcedar)	2						
<i>Pseudotsuga menziesii</i> (Douglas-fir)	2						
<i>Tsuga heterophylla</i> (western hemlock)	2						
<i>Arbutus menziesii</i> (arbutus)		1					
<i>Pinus contorta</i> var. <i>contorta</i> (shore pine)		1					
<i>Arctostaphylos columbiana</i> (hairy manzanita)			1				
<i>Rubus ursinus</i> (trailing blackberry)				1			
<i>Holodiscus discolor</i> (oceanspray)			2				
<i>Rubus parvifolium</i> (red huckleberry)			5				
<i>Gaultheria shallon</i> (salal)			15				
<i>Rubus spectabilis</i> (salmonberry)			5				
<i>Rosa nutkana</i> (Nootka rose)			2				
<i>Fragaria virginiana</i> (wild strawberry)				1			
<i>Cladina portentosa</i> (coastal reindeer lichen)					2		Cover of non-vascular species is high, diversity not captured
Cover by Layer (%)	6	2	30	2	n/a	0	Total Canopy Cover: 7%

*Codominant trees, main layer of tree cover

+Trees greater than 10m that do not reach the main canopy

**All woody plants less than 10m tall

++All herbaceous species, regardless of height and some low woody plants less than 15cm tall

*+ All bryophytes, terrestrial lichens and liverworts

T stands for Trace or less than 1%

Ecological Community: Douglas-fir – western hemlock / salal Dry Maritime

This forested ecological community is found on the very steep slopes along the water’s edge on the west side of SBNR. The steep slopes and shallow soils result in rapidly drained, nutrient poor conditions. The community was observed and mapped in January 2022, however the steepness of the slopes made it inaccessible for inventory. The canopy is dominated by mature Douglas-fir and salal is common in the understorey.

Table 10. Douglas-fir – western hemlock / salal Dry Maritime Ecological Community Overview.

Ecological Community	Douglas-fir – western hemlock / salal Dry Maritime <i>Pseudotsuga menziesii</i> – <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i> Dry Maritime
Classification	CWHxm1/03
Structural Stage (ST)	6 (mature)
Status (BC List)	Red-listed
Photo point	4
Ecological Community Description	Forest community found on dry and typically nutrient-poor sites. Occurs on the west side of SBNR on the very steep slopes along the water.
Disturbance Notes	Past logging
Anticipated Change/Succession	If undisturbed, this community will continue to mature. The canopy is likely to remain relatively unchanged, dominated by Douglas-fir and western hemlock.
Wildlife Observations	n/a

*Codominant trees, main layer of tree cover.

+Trees greater than 10m that do not reach the main canopy.

**All woody plants less than 10m tall.

++All herbaceous species, regardless of height and some low woody plants less than 15cm tall when fully grown.

*+ All bryophytes, terrestrial lichens and liverworts.

T stands for Trace or less than 1%



Photo 7. Representative photo of the ecological community Douglas-fir – western hemlock / salal Dry Maritime (Photo Point 4, App. D).

3.8 Wildlife Species

A wildlife survey of the SBNR land was conducted in 2014 (Bianchini Biological Services 2014). It was found that preferred habitat of nine (9) Federally and/or Provincially listed at risk wildlife species may occur in SBNR, which falls within the geographic range of these species.

Potential breeding habitat for several SARA and provincially listed wildlife species occurs in SBNR, including: Band-tailed Pigeon, Great Blue Heron, Olive-sided Flycatcher, Common Nighthawk and Western Screech-owl. Roosting sites suitable for Double-crested Cormorants are also present. SBNR provides potential breeding/roosting habitat for passerines, woodpeckers and several bat species including Little Brown Myotis

Table 11. Federally and/or Provincially listed at risk wildlife species that occur or may occur in SBNR based on BCCDC records and local knowledge. Likelihood of occurrence within the study area based on the field assessment results (Bianchini Biological Services 2014) is also indicated.

Species Common/Scientific Name	Federal/Provincial Status		Legislation			Site Occurrence
	COSEWIC / SARA Status*	BCCDC Status**	SARA*	Provincial Identified Wildlife	Provincial Wildlife Act	Expected Onsite Habitat Use
Vertebrates: Birds						
Great Blue Heron, fannini subspecies (<i>Ardea herodias fannini</i>)	SC (Mar 2008)	Blue	SC (Feb 2010)	Yes (May 2004)	X	Suitable – Mature trees within the study area provided potential nesting sites. Observed feeding along foreshore
Double-crested Cormorant (<i>Phalacrocorax auritus</i>)	NAR (May 1978)	Blue			X	Potential – Suitable roosting sites within the study area and suitable foraging sites offshore
Northern Goshawk, laingi subspecies (<i>Accipiter gentilis laingi</i>)	T (Apr 2013)	Red	T (Jun 2003)	Yes (May 2004)	X	Potential - Mature trees within the study area provided limited potential nesting sites.
Band-tailed Pigeon (<i>Patagioenas fasciata</i>)	SC (May 2021)	Blue	SC (Feb 2011)		X	Suitable - Breeding habitat may occur within the conifer- dominated stand within the study area and adjacent forests
Western Screech- Owl, kennicottii subspecies (<i>Megascops kennicottii kennicottii</i>)	T (May 2012)	Blue	T (Feb 2017)		X	Potential - Breeding habitat may occur within the conifer- dominated stand within the study area and adjacent forests.

Common Nighthawk (<i>Chordeiles minor</i>)	SC (Apr 2007)	Yellow	T (Feb 2010)		X	Suitable – Reported as a potential breeder on Keats Island. Nesting occurs on the ground on a bare site in an open area including sand dunes, beaches, logged areas, forest clearings, rocky outcrops and flat gravel roofs of buildings. Limited breeding habitat identified within the study area
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	SC (April 2018)	Blue	T (Feb 2010)		X	Suitable – Have been recorded on Keats Island. Potential breeding habitat may occur along habitat edges.
Vertebrates: Mammals						
Little Brown Myotis (<i>Myotis lucifugus</i>)	E (Nov 2013)	Yellow	E (Nov 2014)		X	Suitable - Have been recorded on Keats Island. Potential roosting habitat may occur within the mature trees of the study area
Invertebrates: Butterflies						
Silver-spotted Skipper (<i>Epargyreus clarus californicus</i>) subspecies		Red				Potential – historical records for this species (attributed to migrants) do occur for islands within Howe Sound.

*SARA Status: SC=Special Concern; T=Threatened; E=Endangered; and NAR=Not at Risk

**BCCDC Ranks: Red = Extirpated, Endangered or Threatened; Blue = Special Concern; and, Yellow=Not at Risk

A resident of Keats Island noted in the SBNR questionnaire (Appendix X) that she has observed Bald Eagles, Common Ravens, seals and sea lions at or near SBNR, while another respondent had observed mergansers, Great Blue Herons, Belted Kingfishers and coyote.

3.9 Expected Change over Time

The forests of SBNR are expected to further mature over time. The tree species composition may change, as summer drought conditions are exacerbated by climate change. Western redcedar has been shown to be highly vulnerable to periods of drought on the south coast over the past several years. Cedar trees on sites with the minimal acceptable moisture availability for this species' survival will decline in vigor and ultimately die off as moisture availability in the growing season is further decreased due to climate change. Douglas-fir is likely to occupy the canopy space that becomes available on these sites, as Douglas-fir is significantly more drought tolerant than the other main canopy species of SBNR.

4 Threats

4.1 Threats Matrix

Table 12. Potential threats and their possible impact on biodiversity targets, by habitat type.

Threats	Forest	Coastal Bluff & Beach	Marine Habitat (outside of SBNR)	Overall Threat
Motorized Land Vehicles:	Low	Low	n/a	Low
Motorized Boating: The Islands Trust has mapped suitable forage fish spawning habitat along Sandy Beach for Surf Smelt (<i>Hypomesus pretiosus</i>) and Pacific Sand Lance (<i>Ammodytes hexapterus</i>) and patches of offshore eelgrass. There is also an archeological site in the intertidal zone. Dropping anchor off Sandy Beach may significantly damage these important natural and cultural features.	n/a	Medium	High	High
Mountain biking: causes wildlife disturbance, trampling of vegetation, soil disturbance & erosion.	Medium	Low	n/a	Low
Group gatherings: Residents have reported that it is not uncommon for multiple boats to anchor at once to have a party on the beach. This has often resulted in refuse being left behind, including human waste.	Low	Medium	Medium to High	Medium
Fire: Fire suppression has resulted in a change of fire regime to lower frequency and higher intensity fires. A high intensity fire in SBNR would be catastrophic. This is a threat across all the islands of Howe Sound. Vegetation recovery post-catastrophic fire is slow. Due to the contiguous forest cover of SBNR and ample coarse woody debris, the impact of a wildfire is likely to be high. The likelihood of one occurring without control is low to moderate.	High	Moderate	n/a	High
Invasive Non-Native Species: A significant threat to biodiversity. According to the International Union for Conservation of Nature (IUCN), it is second only to habitat loss. The impact on native ecosystems, habitats and species can be severe and often irreversible. Invasive plant species in SBNR are low in number and cover, however they should be removed, and the site monitored for new occurrences.	Low	Low	unknown	Low
Problematic Native Species: Hyper-abundant Mule Deer (<i>Odocoileus hemionus</i>) can be problematic, dramatically altering understory vegetation structure and composition and adversely affecting songbird populations (Martin et al. 2010).	Medium	Low	n/a	Low

Climate Change: Hotter, drier summers have occurred over recent years and predictions are that this trend will continue and worsen. These conditions are likely to have a significant impact on SBNR forests over time. Canopy composition will shift as species such as cedar die off in drier sites. The shoreline of SBNR will likely be affected significantly by sea level rise, presumably eliminating the current sand beach.	Medium	High	Unknown, possibly high	High
Overall Threat Status for Protected Area	Medium	Medium	Unknown	Medium

Definitions:

Very High: The threat is likely to destroy or eliminate the biodiversity target.

High: The threat is likely to seriously degrade the biodiversity target.

Medium: The threat is likely to moderately degrade the biodiversity target.

Low: The threat is likely to impair the biodiversity target only slightly

4.2 Expected Change to Threats over Time

The threat of a high-intensity wildfire may become high due to the hotter and drier conditions expected with climate change, and the continued fire suppression management in the region.

The threat potential from motorized boating is likely to increase as the population increases in the area. Degradation from group parties on the beach is also likely to increase if not restricted and monitored.

Invasive plant species are likely to continue to establish in SBNR. The frequency of establishment is in part influenced by the population levels of these species outside of SBNR where they may not be controlled, and seeds brought in on visitors shoes and clothing.

5 Community Engagement

5.1 Adjacent Landholders

In preparation for the development of the Management Plan, letters were sent to all landholders and neighbours within a 2.5 km radius of SBNR. A total of 37 letters were mailed on November 15, 2021 (Appendix H). The letters contained information about Sandy Beach Nature Reserve, an invitation to a public webinar on Zoom, and both a paper copy of the questionnaire and a link to a digital version (see Appendix I).

5.2 First Nations

A letter was emailed to the Siwxwú7mesh_ Úxwumixw (Squamish Nation) on November 16, 2021 (Appendix G). The letters contained information about Sandy Beach Nature Reserve, an invitation to a public seminar on Zoom, and the questionnaire (see Appendix I). To date there has been no response.

5.3 Conservation Partners and Community Members

The Islands Trust Conservancy presented a public zoom seminar on December 8, 2021. A total of 12 members of the public registered and attended and an unknown number watched it as a live stream. Consultant, Claudia Schaefer, gave a brief slide show outlining management goals, objectives, ecological features and management issues which included maps and photographs of SBNR. The public was given the opportunity to ask questions and provide input on general management planning for SBNR.

An online questionnaire was made available from November 15, 2021 – January 5, 2021. The webinar and questionnaire were advertised on local social media networks and in the Coast Reported newspaper.

5.4 Engagement Results

The questionnaire regarding management of SBNR was completed by 57 people. Of the respondents, 40% live on west Keats Island, 12% on east Keats, and 2% live mid-island. Thirty-seven percent (37%) do not live on Keats Island but hold property there, 9% were visitors to the island. Almost all respondents (98%) have visited SBNR: 19% visit once a month or more, 56% visit a few times a year, 19% have been to SBNR a few times, and 4% had visited once.

Most people who answered the survey access SBNR by walking from their residence (66%), while some take a private boat directly to Sandy Beach (9%) and others drive to Keats Landing and then walk (12%).

The two most popular activities to partake in when visiting SBNR by far were hiking/walking and swimming. Wildlife viewing, dog walking and kayaking were other common activities.

When asked to choose the three most important values of nature reserves, the most common choices were:

- *Conservation for the sake of the intrinsic value of nature (74%)*
- *Protection of habitat for at-risk species (70%)*
- *Recreational opportunities (49%)*
- *Ecosystem services (42%)*
- *Aesthetic appeal (28%)*

Some respondents included their thoughts regarding the greatest threats to the health of SBNR. Common comments were:

- Prevent use of mooring buoys and anchoring off-shore
- Emptying boat holding tanks off-shore
- Erosion due to lack of trail maintenance
- Overuse as a tourist destination
- Boaters/jet skis from off-island grounding on shore, partying, leaving garbage

- Camping
- Human and dog waste
- Vehicle access including bicycles
- Campfires

6 Management Recommendations

The guiding management principle for SBNR is to allow natural processes to occur without human influence, apart from fire. Natural disturbance factors such as wind (windthrow), pest infestation, disease, and wildlife use should proceed without intervention. Only the removal of invasive plant species is sanctioned.

Educational signage is needed to deter visitors from activities inappropriate in a nature reserve, such as vehicle use (including bicycles), building campfires, camping, leaving refuse or human waste, removing natural objects or vegetation, etc.

6.1 Management Roles

The Islands Trust Conservancy is the sole landholder of SBNR and monitors the reserve annually to determine any management concerns.

Table 13. Partners and their roles in management of SBNR.

Partner	Role
<i>Islands Trust Conservancy</i>	Landholder
<i>Sunshine Coast Conservation Association</i>	Covenant Holder and Management Group
<i>TLC The Land Conservancy</i>	Covenant Holder and Management Group
<i>Keats Island Conservation Group</i>	Management Group

6.2 Permitted and Prohibited Uses⁷

Permitted uses include:

- Yearly monitoring by ITC staff (or as required)
- Periodic monitoring by SCCA or TLC representatives
- Scientific research if approved by ITC
- Fire emergency vehicle access
- Low impact recreational uses: nature appreciation, hiking/walking, wildlife viewing, swimming.

Prohibited uses include⁷:

- Dogs off leash
- Non-emergency motorized and non-motorized vehicles (e.g. bicycles)

- Hunting⁸
- Horseback riding
- Camping
- Fires (including below high tide line)
- Livestock grazing
- Trail development
- Forestry or tree removal (including tree parts)⁹
- Collection of plants, animals, fungi or natural shoreline materials⁹
- Drone navigation

⁷ ITC acknowledges the inherent rights of Indigenous Peoples under Section 35 of the Canadian Constitution

⁸ Hunting under Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

⁹ Harvesting and gathering under Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

6.3 Proposed Monitoring Program

Covenant Monitoring

Annual covenant monitoring efforts by the covenant holders are intended to ensure the terms and intent of the covenant are being upheld. If an issue is found to be in violation of the terms of the covenant, ITC will work in cooperation with the covenant holders to find an appropriate remedy or solution.

ITC Nature Reserve Monitoring

ITC will conduct an annual monitoring site visit of SBNR, as it does with all its holdings. The visits bring together the management partners on-site to assess the character and key features of SBNR, evaluate the effectiveness of the management program and to identify any management issues or trespass that require action and recommend activities for the year ahead. The recommended monitoring route is provided in Appendix I, and can be adapted each year to ensure that all areas of SBNR are covered routinely. Annual monitoring visits are typically completed in half a day.

Trail Use

Trail condition should be assessed for evidence of prohibited activities (such as off-leash dog walking or mountain biking). SBNR monitoring is intended to observe and report any potential unauthorized trail development.

Boundaries, Encroachment

It is recommended that the SBNR boundaries be monitored, particularly those that abut private holdings. The northern boundary is adjacent to private cottages and is a popular access route to and through SBNR to Salmon Rock. The area surrounding the two hydro poles (the ROW) has been kept clear of trees and the invasive Himalayan blackberry is present. The ROW should be carefully monitored for invasive species and degradation of the surrounding habitat.

Species & Habitat (Biological) Monitoring

Species at risk surveys, wildlife surveys and monitoring are encouraged during appropriate times of year to assess which species are present. Monitoring of invasive species occurrence is advisable over time so that control measures can be taken as required.

6.4 Public Access

SBNR will be accessible to the public. Access is on foot from Keats Landing along Salmon Rock Trail. Residents of the Keats Camp holdings have trail access through the northern portion of SBNR near the beach. This short section of trail is for residents only and not the general public.

6.5 Signage

There is currently one signpost and two signs erected at SBNR, in addition to the signage on the BC Hydro poles. The signpost at the trailhead of Sandy Beach Trail, where it leaves Salmon Rock Trail, has deteriorated and needs updating. It should indicate the reserve status and list the main prohibited activities such as no fires (even below high tide line), no camping, no bicycle or other vehicle use. Contact information should be included, and visitors should be encouraged to report infractions of the reserve policies.

Two small signs are posted at the beach by Keats Camp indicating that fires and camping are not allowed. These can be removed. An interpretive sign should be erected where the public trail enters the beach, describing the sensitivity of the habitat and the activities that are not permitted.



Photo 8. Sign for Sandy Beach on the north side of Salmon Rock Trail (photo point 27, Appendix D).



Photo 9. Sign for Sandy Beach on the south side of Salmon Rock Trail (photo point 27, Appendix D).

6.6 Trail Use, Maintenance and Development

The Sandy Beach Trail is currently a narrow (0.5-1.0 m) foot path with bare earth as substrate. No materials should be brought in to be added to the trail surface. Where salal is overgrowing the trail, branches can be snipped back. No trees or standing snags should be removed unless they are proven to be dangerous to the public.

The route from Sandy Beach Trail to the beach is currently overgrown and needs to be trimmed. It has sections of terrain that need to be altered to allow better accessibility. The entrance to the beach, from the western hydro pole to the logs at the high tide line, needs steps to become visitor-friendly. If the large driftwood logs are immovable and stable, steps could be carved out. Otherwise concrete steps may be the only option but must be kept narrow to reduce hardening of the shoreline. Midway from the beach to the main Sandy Beach Trail is a steep section of loose earth. Steps could be terraced with wooden tie holders. See Appendix E for detailed photos of this section of trail.

6.7 Protection Initiatives for Sensitive Ecosystems and Species and Ecological Communities at Risk

Protection initiatives for Sensitive Ecosystems (Mature Forest, Beach, Herbaceous bluff) and ecological communities at risk will begin with invasive species removal. New interpretive signs at the trailhead for Sandy Beach Trail and at the beach are necessary to alert visitors to the sensitivity of the ecosystems and the activities that are not permitted in order to protect them.

Signage at the beach could include information regarding the at risk Common Nighthawk, alerting visitors to watch where they step as nighthawks lay their eggs on bare sand.

The following surveys are recommended as budget allows: early season plant species particularly in the coastal bluff habitat, reptile, amphibian, bats and other small mammals.

The marine ecosystems offshore are not included in SBNR, however good stewardship of the terrestrial domain positively affects the neighbouring marine environment. Given the high ecological significance of the offshore area (forage fish spawning habitat and eel-grass occurrence) and possible cultural importance to First Nations, it is strongly recommended that management of boat anchoring be pursued. This would also have a positive effect on SBNR by limiting the use of the reserve as a remote location for party gatherings. The possibility of installing a single buoy to avoid unpermitted anchoring should be considered. A qualified diver would be required to avoid installing the buoy in a sensitive area.

6.8 Ecological Restoration Options

Apart from removal of invasive plant species, which are relatively infrequent in number and spread, SBNR is largely intact and requires little in the way of ecological restoration at this time. The hydro ROW is significantly disturbed, however revegetation in this area is not an option under the stipulations of the ROW.

6.9 Scientific Research/Education Opportunities

Scientific research if funding or opportunity arises should include:

1. Survey of at risk vascular plants in early spring, particularly in the coastal bluff and ideally by kayak along the entire length of the SBNR shore which has not yet been surveyed and is not accessible by land.
2. Bryophyte and lichen survey of the coastal bluff.
3. Additional breeding bird surveys, particularly focused on at risk species identified as having suitable habitat within SBNR.
4. Bat survey: the Little Brown Myotis is listed as Endangered by COSEWIC and has been recorded on Keats Island. The mature trees and rock crevices of the study area provide potential roosting habitat for this species.
5. Amphibian and reptile survey.

6.10 Exotic and Invasive Species Management

SBNR is notable for having low cover of exotic and invasive species. There are small patches (Figure 15) of Himalayan blackberry (*Rubus discolor*), English ivy (*Hedera helix*), English holly (*Ilex aquilifolium*) and laurel (*Daphne* sp.) that need to be removed to limit their spread into other areas of SBNR. Cherry laurel (*Prunus laurocerasus*) is present on the neighbouring property to the north and efforts should be made to work with the neighbours to remove them to avoid spread into SBNR.

Protocols for removal of each species should follow the methods provided by the Invasive Species Council of BC. Patch areas where invasives have been removed should be monitored yearly in particular, as further management control measures may be necessary.

6.11 Wildfire Risk Management

Fire events have been minimized in frequency, intensity and size for many decades through human intervention. While some Douglas-fir dominated forests are fire-maintained ecosystems and fire suppression has impeded a natural process of healthy Douglas-fir ecosystems, other forest types are not fire-dependent and are able to survive periodic fires of light intensity. Although Douglas-fir is present in SBNR, the forests on these north-facing slopes do not require a fire event for continued health. They are progressing towards greater maturity and ultimately a climax state. It is recommended that fire suppression continue in SBNR and the vicinity.

Removing woody debris from SBNR to reduce the intensity of a fire, should one occur, is not recommended as the disturbance caused by such action to ecological communities would be too significant. Coarse woody debris is a vital ecological component of mature and old-growth forests. Many species depend on this debris for shelter and foraging.

The possibility of a human-caused fire event is a concern as users of Sandy Beach have been known to light beach fires. The risk of fire spreading is significantly greater during the dry

season and if there is wind off the water. Signage should be strongly worded to deter people from having campfires, even below the high tide line.

Developing a plan for fire management in consultation with the Keats Island Volunteer Fire Department and BC Wildfire Service to identify optimum fire suppression techniques is recommended. This information should be provided to the province to be included in their annual fire plan. It is preferred that fire retardants or saltwater are not used for fire suppression within SBNR since both can cause ecological damage to ecosystems.

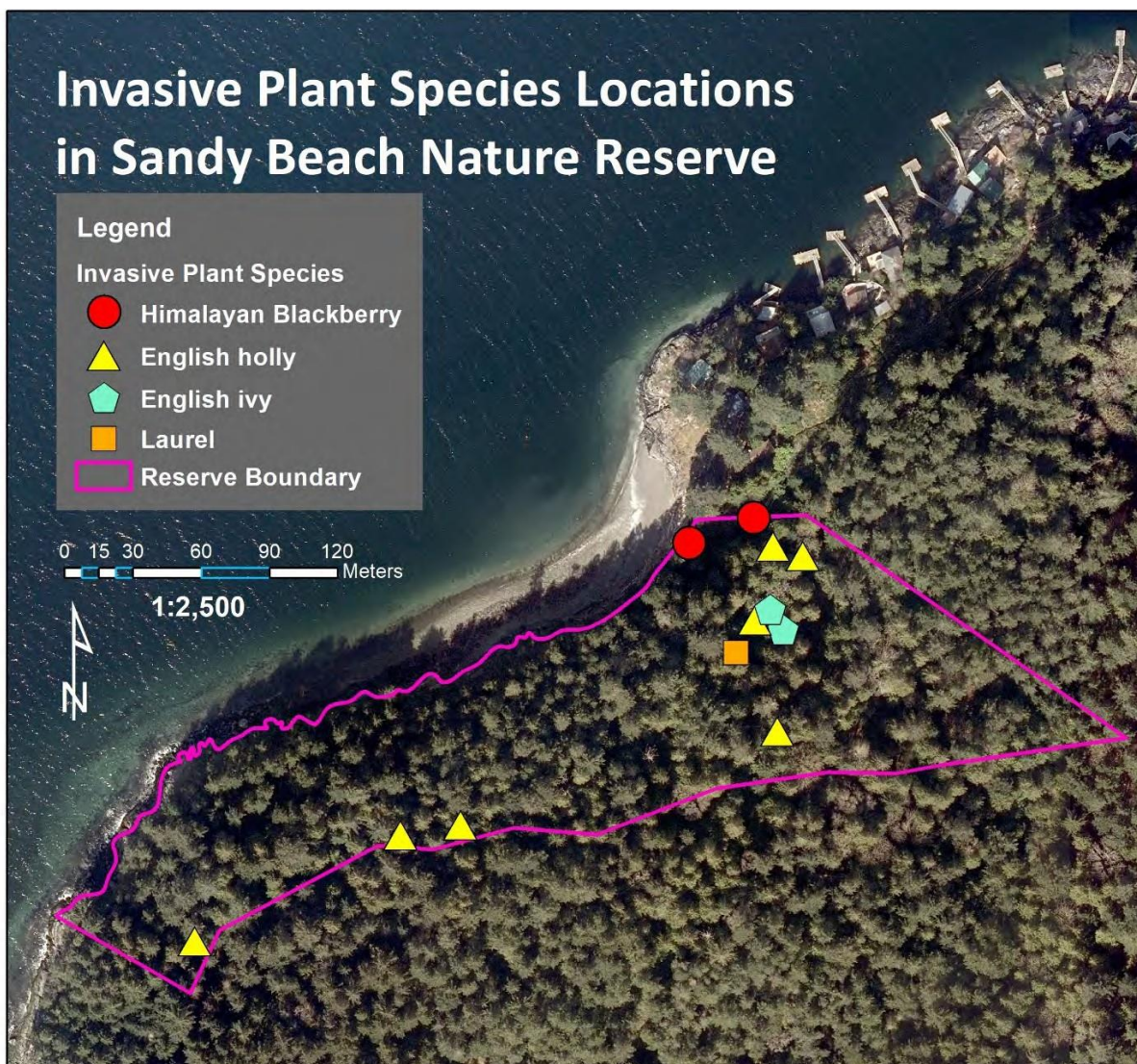


Figure 15. Known locations of invasive plant species in SBNR. Map created January 2022.

6.12 Climate Change Impacts and Management

Climate change may impact the distribution of ecosystems across the landscape, affecting vegetation patterns, hydrology, and may encourage pest outbreaks. Trends that may prevail in this region include upslope migration of tree species and ecosystem boundaries, and increased fire frequency (Hebda 1997). Supporting protection and connectivity between

large areas of natural ecosystems will allow for the movement of species into new habitats as vegetation patterns shift due to climate change. Western redcedar is particularly prone to the drought conditions of the past several years, and die-off has been recorded extensively in the South Coast region. Cedar trees on sites that previously met their minimum moisture requirements for survival and growth are no longer viable. In SBNR, cedars in rocky areas are most likely to show signs of decline first. No management strategies will reverse this pattern. Standing snags should be left in situ as they provide important wildlife features. Downed trees should also be left on the forest floor.

Given that SBNR borders the ocean along its length, sea level rise due to climate change may significantly affect the near shore ecosystems. The beach itself may not be present in the future. In addition to sea level rise, the increasing frequency and intensity of winter storms due to climate change can have several adverse effects on SBNR, such as sand sediments being washed away from the beach, large-scale windthrow events, and increased refuse deposited on shore.

7 Action Items

7.1 Immediate Actions (1-2 years):

1. Support all partners, contractors and volunteers to complete cultural competency training in regard to reconciliation, knowledge and history of Coast Salish and Indigenous Peoples.
2. Engage with First Nations to ensure that the management plan is reflective of treaty, inherent rights, and the territories of each Nation.
3. Work in collaboration towards a Management Plan for Areas of Cultural Heritage, gathering and harvesting, and Sacred Significance with First Nations.
4. Install signage at the Sandy Beach trailhead at Salmon Rock Trail and the entrance to the beach from the public trail. Signs should indicate activities that not permitted, while encouraging an appreciation and respect for SBNR ecosystems and wildlife.
5. Install a sign at the junction of the new connector trail to the beach and the main Sandy Beach Trail, indicating the section further north is not for public use (for residents only).
6. Remove invasive species from SBNR before they become more established and work with neighbours to encourage removal of invasives that may spread into SBNR.
7. Ensure that the new trail from the beach is cleared to 0.5 m wide and install steps at the high tide line and the steep section upslope.
8. Establish a volunteer warden program and designate a warden to visit the site regularly and work to monitor the property and identify management concerns.

7.2 Short term Actions (3-5 years):

1. Develop a parallel *Management Plan for Areas of Cultural Heritage and Sacred Significance* document with First Nations.
2. If funding allows supplement the ecological inventory by conducting a rare plant survey in the spring season.

3. If funding allows consider further breeding bird surveys and other wildlife surveys, such as bats, reptiles and amphibians.
4. Conduct a follow-up survey of invasive species and remove any new or residual occurrences.
5. Consult local fire strategies and the provincial BC Wildfire Service to communicate best management practices in case of a wildfire.

7.3 Long term Actions (5+ years)

1. If funding is available, conduct further wildlife surveys, with a focus on species at risk, over a range of seasons to more fully document the biodiversity of SBNR and guide future management actions.

7.4 Ongoing or Annual Action Items

1. Work with local First Nations towards cooperative management of SBNR using the *Management Plan for Areas of Cultural Heritage and Sacred Significance*.
2. Conduct annual covenant monitoring to identify and address any management concerns that may arise.
3. Monitor the condition of the steps leading to the beach.
4. Monitor and remove invasive species as required.

8 Conclusion

The Sandy Beach Nature Reserve protects four at risk ecological communities and several Sensitive Ecosystems. It supports a wide array of wildlife and plant species and may also support at risk species. The ecological communities of SBNR are functioning well and management needs are minimal. The guiding principle of the management of SBNR is to allow the natural functions of the site to continue unimpeded by human presence or activities.

Existing and future invasive species occurrences will be removed and public access to the beach will be improved.

ITC will act on the management action items identified in this plan to achieve the vision, objectives and purpose of SBNR. Future management issues may lead to further action items that will be identified in work plans and in future revisions of this management plan.

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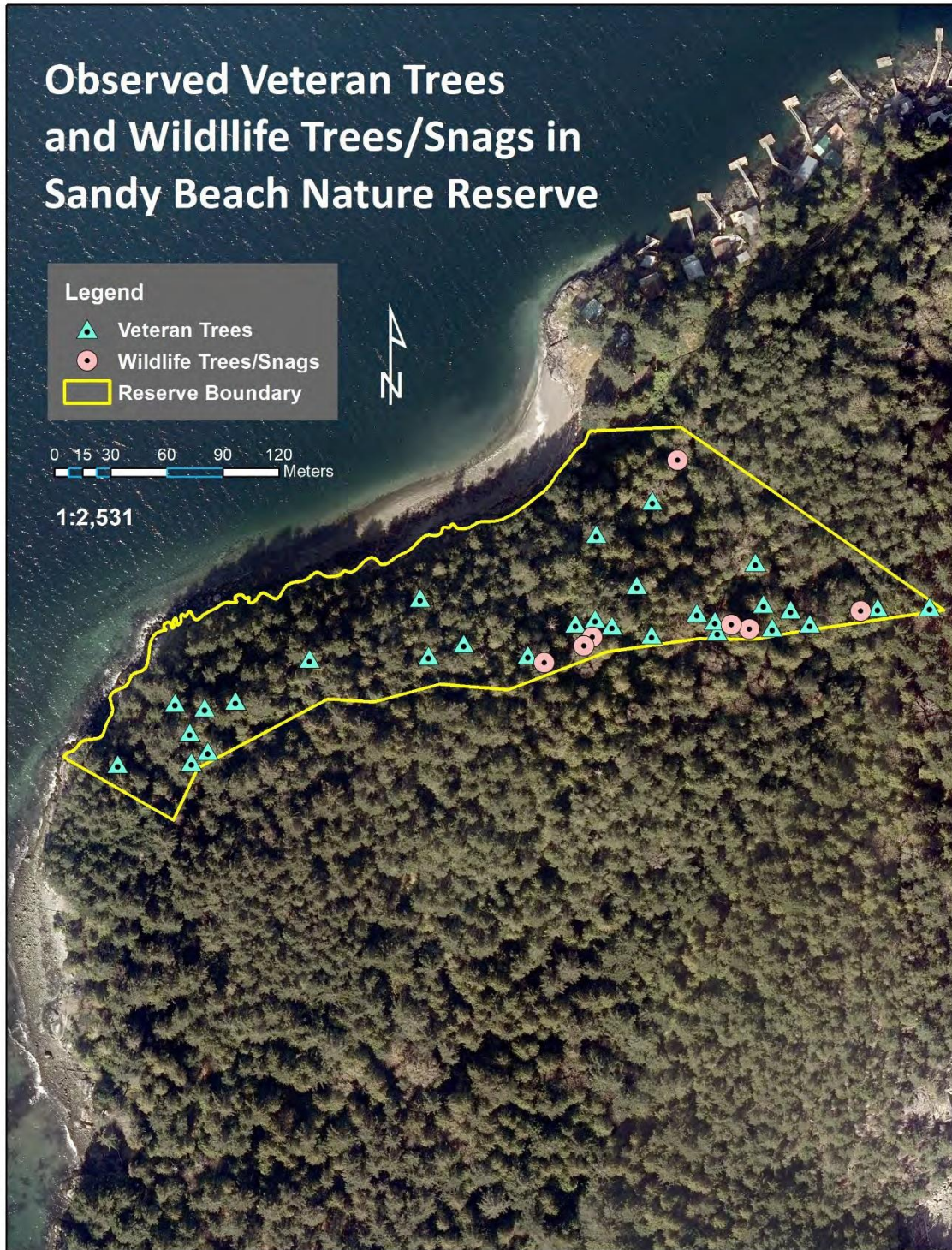
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10 Appendices

Appendix A. Ecological Communities Map



Appendix B. Observed veteran trees and Wildlife Trees or snags.



Appendix C. Map of Photo Documentation Points



Appendix D. List of reference photos taken in or near the Sandy Beach Nature Reserve during fieldwork (September 24, 2021 and January 27, 2022).

PHOTO POINT	LOCATION (UTM)	DIRECTION where relevant (degrees)	PHOTO-GRAPHER	DATE YYYY-MM-DD	DESCRIPTION
1	464347N 5470835E	110	CS*	2022-01-27	CWHxm1/05 habitat
2	464234N 5470784E	345	CS	2022-01-27	CWHxm1/01 habitat
3	464251N 5470832	170	CS	2022-01-27	Coastal bluff habitat
4	464107N 5470752E	10	CS	2022-01-27	CWHxm1/03 habitat
5	464300N 5470875E	25	CS	2022-01-27	East end of Sandy Beach
6	464308N 5470883E	115	CS	2022-01-27	Driftwood on Sandy Beach
7	464334N 5470886E	135	CS	2022-01-27	BC Hydro pole and sign
8	464334N	310	CS	2022-01-27	South side of hydro pole
10	464334N		CS	2022-01-27	Detail of ground at hydro pole
11	464339N 5470888E	345	CS	2022-01-27	Overgrown access to beach
12	464334N		CS	2022-01-27	Upper view of hydro pole
13	5470886E	110	CS	2022-01-27	Driftwood pile at trail entrance
14	464344N 5470885E		CS	2022-01-27	Steep portion of trail access to beach
15	464394N 5470783E		CS	2022-01-27	Property pin
16	464360N 5470855E		CS	2022-01-27	Property pin
17	464124N 5470715E		CS	2022-01-27	Property pin
18	464338N 5470904E		CS	2022-01-27	Property pin
19	464334N 5470886E		CS	2022-01-27	Keats Camp sign

20	464289N 5470864E	35	CS	2022-01-27	Keats Camp sign
21	464134N 5470720E	350	CS	2022-01-27	Loose brush
22	464134N 5470720E	340	CS	2022-01-27	Loose brush
23	464282N 5470769E	75	CS	2022-01-27	Cut logs beside trail
24	464367N 5470877E	300	CS	2022-01-27	Trail junction
25	464371N 5470888E	40	CS	2022-01-27	Residents trail connector
26	464355N 5470871E		CS	2022-01-27	Water hose line
27	464259N 5470758		CS	2022-01-27	Start of Sandy Beach Trail from Salmon Rock Trail

* CS = Claudia Schaefer

Appendix E. Photos taken during fieldwork on September 24, 2021 and January 27, 2022.



Photo Point 5.
East end of Sandy Beach.
Boat is on private property.
Photo: C. Schaefer.



Photo Point 6.
Looking west along Sandy Beach.
Photo: C. Schaefer.



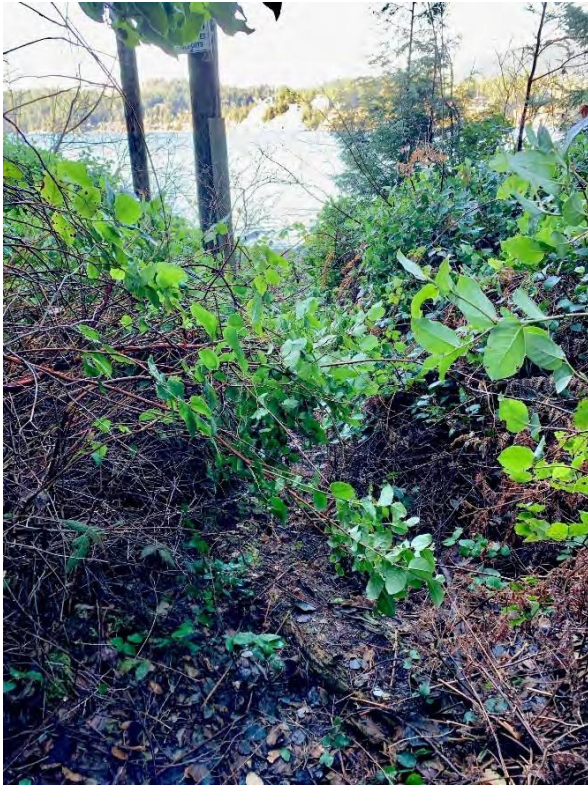
Photo Point 7.
BC Hydro pole and sign at
Sandy Beach. Photo: C.
Schaefer.



Photo Point 8.
South side of BC Hydro pole. Photo: C.
Schaefer.



Photo Point 10.
Aboveground metal
fixings beside hydro
pole. Photo: C.
Schaefer.



Photos Points 11-14. Access to beach needs clearing (top left); upper view of hydro pole (top right); driftwood at high tide line makes access to/from the trail difficult (bottom left); and steep portion of beach access (bottom right). Photos: C. Schaefer.



Photos Points 15-18. Property stakes: photo point 15 (top left); photo point 16 (top right); photo point 17 (bottom left); and photo point 18 (bottom right). Photos: C. Schaefer.



Photo Points 19 (left) & 20 (right). Signs posted on hydro pole and tree overhanging the beach by Keats Camp, prohibiting fires and camping. Photos: C. Schaefer.



Photo Point 21.
Loose cut brush piled up
that could be removed.
Photo: C. Schaefer.



Photo Point 22.
Additional photo of loose
brush that could be
removed. Photo: C.
Schaefer.



Photo Point 23.
Cut logs along Sandy Beach
Trail. Photo: C. Schaefer.

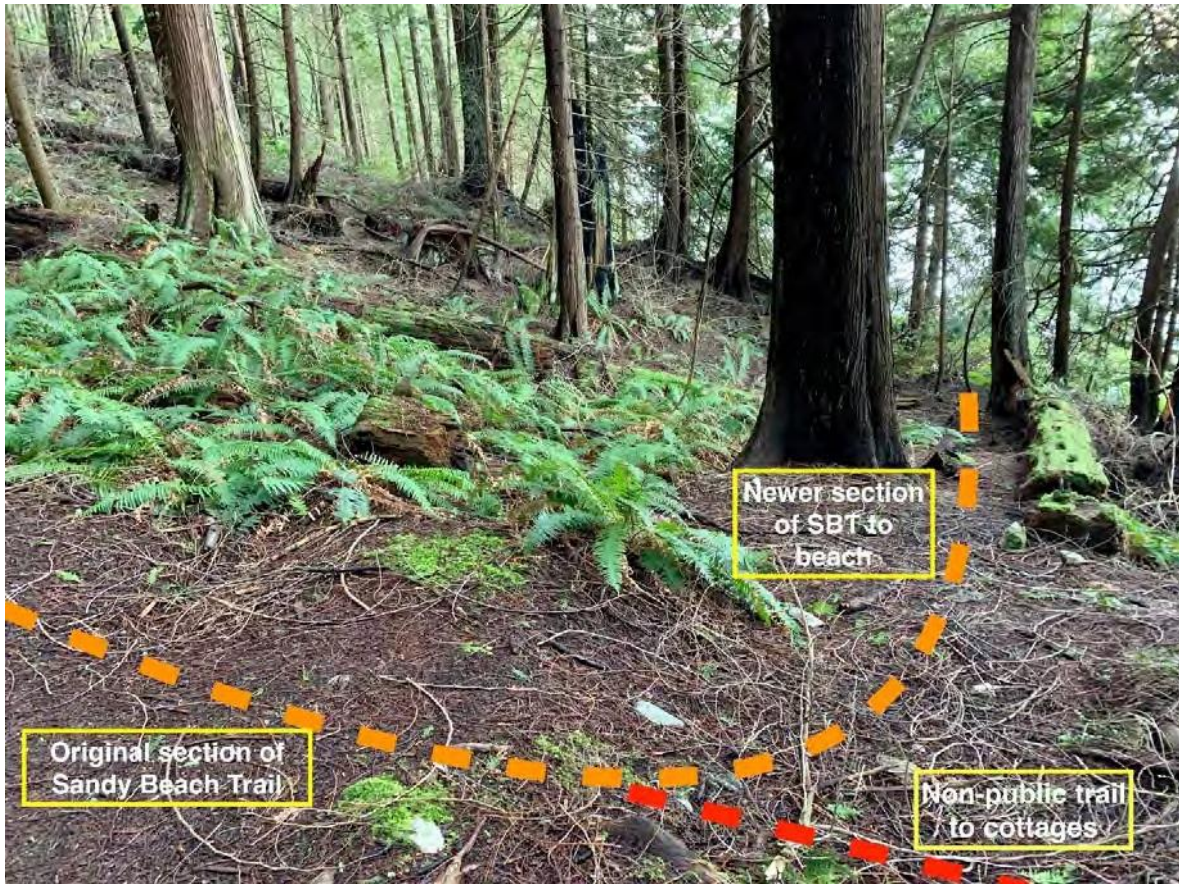


Photo Point 24. Graphic depiction of trail connection to public beach access. Photo: C. Schaefer.

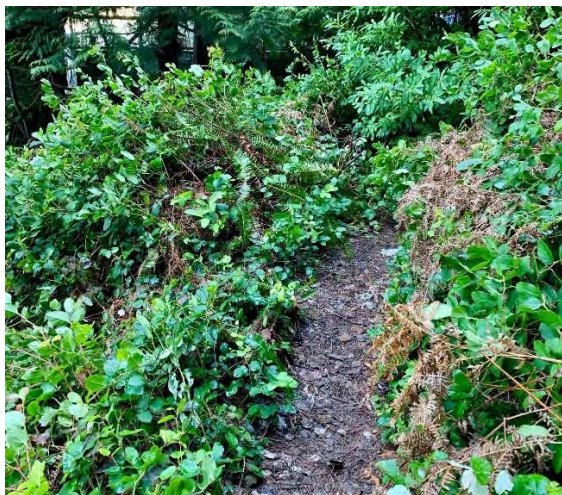
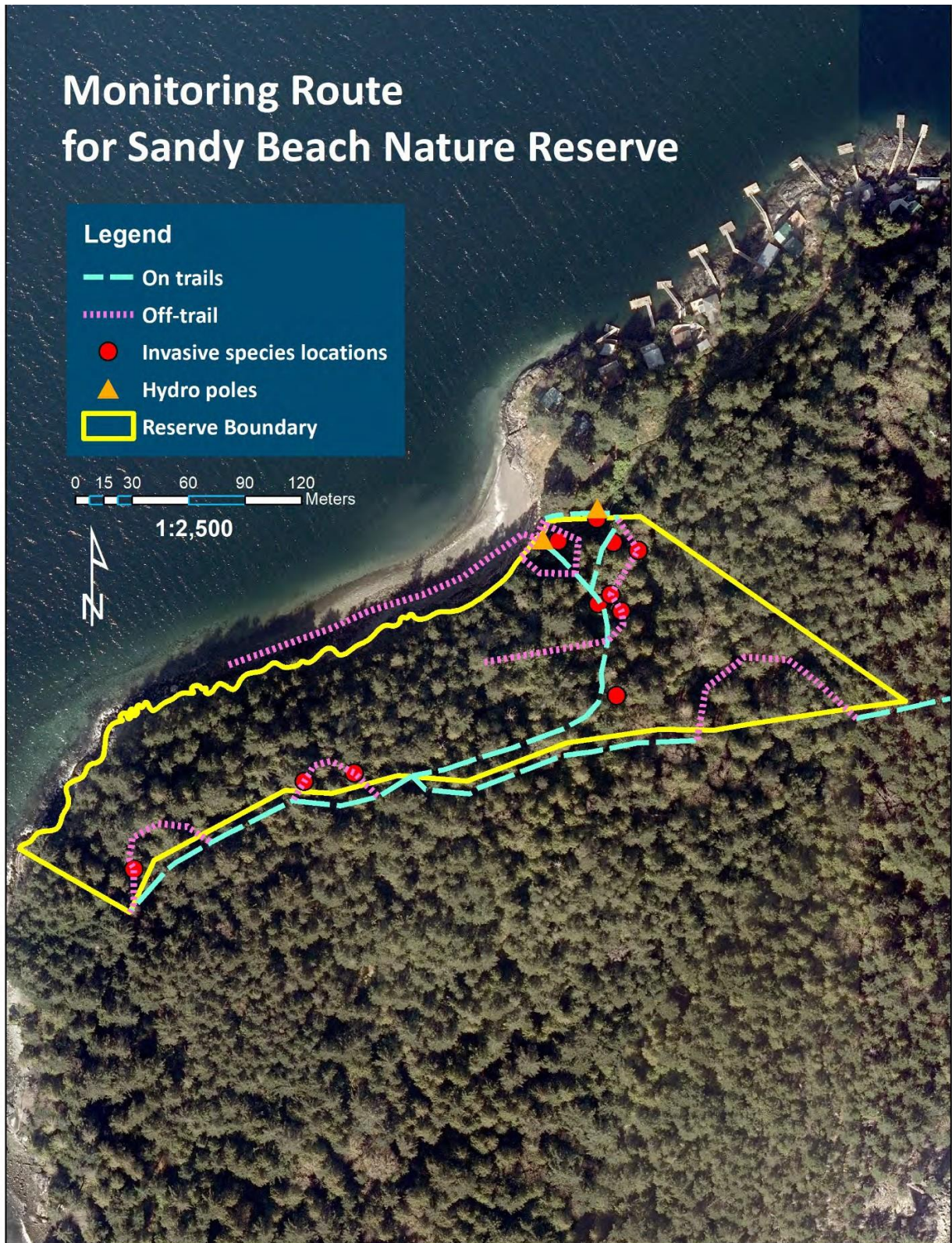


Photo Point 25 (left) & 26 (right). Non-public trail connection to private cottages (left) and water hose line visible above ground (right). Photos: C. Schaefer.

Appendix F. Proposed Monitoring Route





Appendix G. Sample Letter Sent to First Nations

November 15, 2021

Dear Chief and Council,

Re: Sandy Beach Nature Reserve Management Plan, Lheḱ' tines/Keats Island

The Islands Trust Conservancy, through its work as a land trust, is drafting a management plan for Sandy Beach Nature Reserves on Lheḱ' tines/Keats Island.

Islands Trust Conservancy acknowledges and respects that Lheḱ' tines/Keats Island is within lands and waters of the Siwxwú7mesh Úxwumixw (Squamish Nation) and is the homeland and gathering place of many Coast Salish Peoples. Lheḱ' tines/Keats Island is a place of cultural significance and is the location of village sites, archaeological areas, and occupation since time immemorial.

The nature reserve is within your First Nations territorial lands and waters and we want to ensure that the direction of the management plan is reflective of both reconciliation and conservation goals. At this time, ITC would like to work with you to understand the cultural significance and use of the area so that these values can also be preserved and protected—now and into the future. We understand that the cultural significance of this land may be confidential and we would work with you to ensure that the management plan reflects this significance appropriately. Acknowledging the importance of naming and recognition, if there is signage, names, or place names that should be used for these areas please let us know.

Sandy Beach Nature Reserve (PID: 031-259-731, LOT 1 DISTRICT LOT 696 GROUP 1 NEW WESTMINSTER DISTRICT PLAN EPP89532) is a 3.4-hectare nature reserve located on the southwest shoreline of Lheḱ' tines/Keats Island. It is in the Coastal Douglas-fir forest and includes over 250 metres of beachfront. The property provides suitable habitat for threatened and endangered species including birds, such as the Northern Goshawk, Great Blue Heron, and the Olive-sided Flycatcher, and the Little Brown Myotis bat. The beach has been identified as appropriate spawning habitat for surf smelt and Pacific sand lance, two fish species that are important food sources for wild salmon. Take a tour to see protected area locations here: <https://islandstrust.bc.ca/conservancy/protected-places/>

Islands Trust Conservancy would like to undertake a traditional use study in collaboration with you. Islands Trust Conservancy passed a Reconciliation Declaration, committing to building relationships to work with First Nations. We hope to work with your Nation to protect and manage the area and any cultural heritage sites in this nature reserve in a way that is reflective of title, inherent rights, and the territorial lands of your Nation.

You may also be interested to know that Islands Trust Conservancy has developed a draft management

include
date: _____



Figure 1. Lhek' tines/Keats Island, Islands Trust Conservancy Sandy Beach Nature Reserve

A questionnaire can be completed online through our website:
<https://islandstrust.bc.ca/whats-happening/surveys-and-polls/>

The survey will remain online until January 5, 2022, and I can also be contacted at any time using the contact details below.

We have an honorarium available to provide to a community member who would like to provide a welcome at the beginning of the online open house webinar, or to attend to hear about the management plan if they would like. The webinar is on:

Wednesday, December 8, 2022 at 7:30pm.

Register in advance for this webinar or watch it as a live stream:

<https://islandstrust.bc.ca/event/islands-trust-conservancy-sandy-beach-nature-reserve-management-plan-open-house/>

If you would prefer to discuss management with us separately from our current process, we'd be happy to arrange a meeting to hear your input and guidance about management of the land.

Thank you for considering our request to work together. Please contact me at the number or email listed below. Thank you for your kind consideration.

Sincerely,



Nuala Murphy
Property Management Specialist
Islands Trust Conservancy
250-405-5193 | nmurphy@islandstrust.bc.ca

Islands Trust Conservancy's Victoria office is located in Coast Salish territory and we acknowledge with respect the BOKÉCEN, Cowichan Tribes, Halalt, Homalco, K'ómoks, Klahoose, Ts'uubaa-asatx, Lək ʷəŋən (SXIMELEŁ, Songhees, T'Sou-ke), Lyackson, MÁLEXEŁ, Penelakut, Qualicum, Scia'new, səliłwətaʔt, SEMYOME, shíshálh, Snaw-naw-as, Snuneymuxw, Siwxwú7mesh, SʔÁUTW, Stz'uminus, Tla'amin, scəwáθən məsteyəxʷ, We Wai Kai, Wei Wai Kum, W JOŁEŁP, W SIKEM, and xʷməθkʷəyəm territories in which we live and work.



ISLANDS TRUST CONSERVANCY

Protecting Islands in the Salish Sea

Appendix H. Sample Letter Sent to Nearby Landholders and Neighbours

November 15, 2021

Dear Neighbour,

The Islands Trust Conservancy is creating a management plan to guide management of the new Sandy Beach Nature Reserve on Lhek' tines/Keats Island for the next 10 years and we are interested in hearing from you.

Islands Trust Conservancy acknowledges and respects that Lhek' tines/Keats Island is within lands and waters of the Siwxwú7mesh Úxwumixw (Squamish Nation) and is the homeland and gathering place of many Coast Salish Peoples.

Sandy Beach Nature Reserve (PID: 031-259-731, LOT 1 DISTRICT LOT 696 GROUP 1 NEW WESTMINSTER DISTRICT PLAN EPP89532) is a 3.4-hectare nature reserve located on the southwest shoreline of Lhek' tines/Keats Island. Take a tour to see protected area locations here:

<https://islandstrust.bc.ca/conservancy/protected-places/>

The Sandy Beach Nature Reserve was acquired in December 2020 from the Convention of Baptist Churches of BC as part of a rezoning and subdivision application and comes with a contribution which has been allocated to a land management fund.

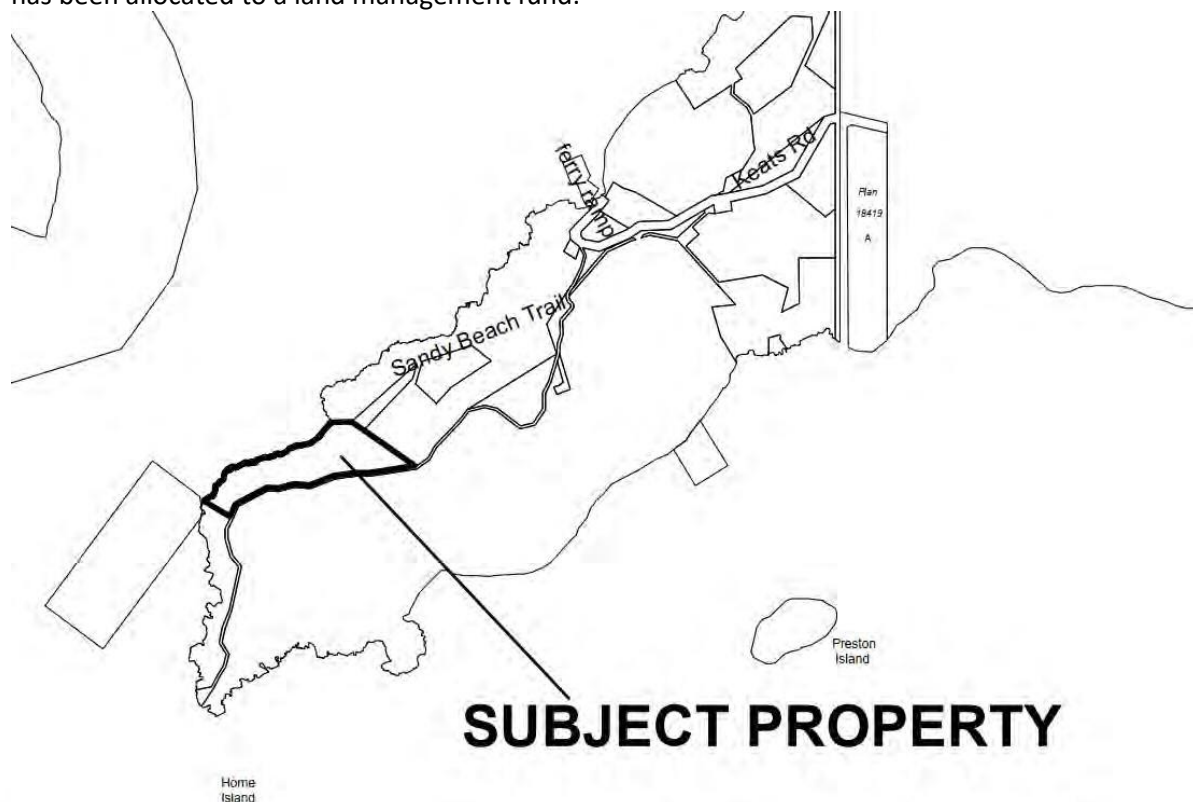


Figure 1. Location Map of Sandy Beach Nature Reserve, Lhek' tines/Keats Island

Sandy Beach Nature Reserve is in the Coastal Douglas-fir forest and includes over 250 metres of beachfront. The property provides suitable habitat for threatened and endangered species including birds, such as the Northern Goshawk, Great Blue Heron, and the Olive-sided Flycatcher, and the Little Brown Myotis bat. The beach has been identified as appropriate spawning habitat for surf smelt and Pacific sand lance, two fish species that are important food sources for wild salmon.

Islands Trust Conservancy will work in partnership with Sunshine Coast Conservation Association and TLC - The Land Conservancy of BC, who will hold a conservation covenant on Sandy Beach Nature Reserve that includes restrictions on the use of the property that will be put in place to protect the native plants and animals within the Nature Reserve in perpetuity. We also welcome on-island support from the Keats Island Conservancy and any neighbours who would like to help as voluntary wardens to keep an eye on any management issues, such as invasive species, trail maintenance etc. Please let me know if you would like to get involved.

Your input is requested for the development of the first Sandy Beach Nature Reserve Management Plan. As a neighbour of the reserve, we would like to hear your ideas and concerns regarding the long-term management of this special place.

The enclosed questionnaire can be:

- completed online through our website:
<https://islandstrust.bc.ca/whats-happening/surveys-and-polls/>
- returned by mail to the Victoria office at 200 – 1627 Fort Street, Victoria, BC V8R 1H8

The deadline to complete the survey is January 5, 2022.

There will be a webinar with information about Sandy Beach Nature Reserve on **Wednesday, December 8, 2021 at 7:30 pm.**

Register in advance for this webinar or watch it as a live stream:

<https://islandstrust.bc.ca/event/islands-trust-conservancy-sandy-beach-nature-reserve-management-plan-open-house/>

Thank you for taking the time to share your ideas regarding management of the Sandy Beach Nature Reserve. For more information, please contact me at the phone number or email listed below.

Sincerely,



Nuala Murphy
Property Management Specialist, Islands Trust Conservancy
250-405-5193
nmurphy@islandstrust.bc.ca

Appendix I. Questionnaire

Sandy Beach Nature Reserve Questionnaire

Islands Trust Conservancy acknowledges and respects that Lhek' tines/Keats Island is within lands and waters of the Siwxwú7mesh Úxwumixw (Squamish Nation) and is the homeland and gathering place of many Coast Salish Peoples. Lhek' tines/Keats Island is a place of cultural significance and is the location of village sites, archaeological areas, and occupation since time immemorial. Protection from land-altering activity in collaboration with First Nations with the Islands Trust Conservancy is the first step to the preservation and protection of this location into the future.

Sandy Beach Nature Reserve is a 3.4-hectare nature reserve located on the southwest shoreline of Lhek' tines/Keats Island and was acquired in December 2020 from the Convention of Baptist Churches of BC as part of a rezoning and subdivision application and comes with a contribution to a land management fund. Take a tour to see protected area locations here:

<https://islandstrust.bc.ca/conservancy/protected-places/>

Sandy Beach Nature Reserve is in the Coastal Douglas-fir forest and includes over 250 metres of beachfront. The property provides suitable habitat for threatened and endangered species and the beach has been identified as spawning habitat for surf smelt and Pacific sand lance, two fish species that are important food sources for wild salmon.

The Islands Trust Conservancy's primary goal for a nature reserve is to protect and nurture the sensitive ecosystems and natural values on this land and limit human impacts. The focus is not on public recreation like a park but rather low-impact recreation (walking/running) on existing trails. The information and actions required to achieve this goal and guide the management of the property will be set out in a management plan that will be updated every 10 years. We welcome community input and ask you to share your thoughts on the protection and long-term management of the Sandy Beach Nature Reserve.

1. Are you a resident of Lhek'tines/Keats Island?

- Yes, I live on west Keats Island (Keats Landing, Plumper Cove, Melody Point)
- Yes, I live mid-island
- Yes, I live on east Keats Island (Eastbourne)
- Yes, I live on north Keats Island (Cotton Point)
- No, but I own property on Keats Island
- No, I'm a visitor

2. Have you ever visited the land that is now Sandy Beach Nature Reserve? If so, how often?

- No, never
- Once
- A few times
- A few times per year
- Once a month or more



Thank you for your time spent helping us plan the future of Sandy Beach Nature Reserve.

<https://islandstrust.bc.ca/conservancy/>

3. If you have visited Sandy Beach Nature Reserve before, how did you get there?

- Private boat directly to Sandy Beach Nature Reserve
- Water taxi or private boat to a public dock and then walked
- Walked from your on-island residence
- Drove to Keats Landing and then walked
- Other (please list):

4. If you have visited Sandy Beach Nature Reserve before, what did you do there?

- Hiking/walking
- Wildlife viewing
- Dog walking
- Swimming
- Kayaking
- Other (please list):

5. Please identify what is special about this place to you. Please list any wildlife and unique plant species you have seen in or near Sandy Beach Nature Reserve:

6. What do you believe to be the most important values of nature reserves? (choose three)

- Protection of habitat for at-risk species
- Ecosystem services (e.g. clean water and air, erosion control, groundwater recharge, etc.)
- Recreational opportunities
- Education and research opportunities
- Tourism
- Aesthetic appeal
- Conservation for the sake of the intrinsic value of nature
- Other (please specify):

7. What activities do you believe are incompatible with the protection of natural features, and should not be allowed within the Sandy Beach Nature Reserve?

8. What do you feel could be the greatest threat to the health of this nature reserve, and should be the highest management priority for the Islands Trust Conservancy



Thank you for your time spent helping us plan the future of Sandy Beach Nature Reserve.

9. Please provide any other relevant information that will help us make the best management decisions for Sandy Beach Nature Reserve.

10. Please share with us any history you know about this property or any knowledge you have about unique cultural or other special features on the property or in the area.

11. If you would like to receive periodic updates from the Islands Trust Conservancy on this and other conservation projects on the islands, please provide your name and email address and you will be added to our e-news:



Thank you for your time spent helping us plan the future of Sandy Beach Nature Reserve.