Inner Island Nature Reserve Management Plan

Denman Island, British Columbia

PREPARED FOR:

ISLANDS TRUST CONSERVANCY

REVISIONS: **SECOND:** **J. Balke, Ecofocus Environmental Consultants, Denman Conservancy Association, Islands Trust Conservancy 2020**

FIRST: **Denman Conservancy Association, 2005**

INITIAL PLAN PREPARED BY: **Joel Ussery, Victoria, B.C. 1994**

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Islands Trust Conservancy, May 26, 2020 by Resolution Number: ITC-2020-XXX

Denman Conservancy Association, Date

Nature Conservancy of Canada, Date

Executive Summary

Islands Trust Conservancy acknowledges and respects that Sla-dai-aich/Ihaytayich (Denman Island) is within the traditional territory of Coast Salish Peoples, whose historical relationship to the land, culture, and spirit of this place continues to this day. Islands Trust Conservancy 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 Inner Island Nature Reserve is a living document that will evolve as opportunities for knowledge sharing arise and understanding grows[1].

The Inner Island Nature Reserve is a 9.4-hectare (23.2-acre) property located in central Denman Island, south of Chickadee Lake. The Reserve is made up of two pieces of land that are separated by a long, narrow wetland property held by BC Parks. This wetland is known as Pickles Marsh or Pickles Beaver Pond. The Inner Island Nature Reserve protects part of Pickles Marsh, as well as three connected creeks. Starting in 1970, the land changed hands several times while Denman islanders made ongoing efforts to protect the wetland and its surrounds. Landholders included private interests, the Vancouver Foundation, the Province, and then the Denman Conservancy Association (DCA), before the Reserve land was finally conserved and donated to the Islands Trust Conservancy in 1992. A conservation covenant, held by the Nature Conservancy of Canada, was placed on the Reserve in 1995.

Located within 640 hectares (1580 acres) of protected forest land, the Reserve is a critical link connecting large areas of forest, wetland habitat, and the drainage system of a broad freshwater catchment area. The Reserve's creeks and adjacent Pickles Marsh contribute freshwater to the year-round flows of Beadnell Creek, Denman's largest salmon-bearing creek. This significant freshwater system is maintained by two beaver dams that are in and immediately adjacent to the Reserve. The mature Douglas-firs and western redcedars of the Reserve provide a buffer for the beavers' wetland activities and for the young recovering forest within the north portion, which was logged in 1984.

The Reserve has significant ecological and recreational value. Most of the forest within the Reserve is classified as grand fir / three-leaved foamflower (*Abies grandis* / *Tiarella trifoliata*) CDFmm/06, a rare ecological community in the coastal Douglas-fir moist maritime biogeoclimatic zone. The rest is in a drier ecological community classified as Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii / Berberis nervosa*), which is also rare. Most of the extensive wetland area is in a rare wetland classification, western redcedar / sword fern - skunk cabbage (*Thuja plicata / Polystichum munitum - Lysichiton americanus)* CDFmm/Ws53. Three rare species are confirmed within the Reserve and an additional 11 would be expected in this habitat. Visitors to the Reserve use a pleasant

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

walking trail on the east side of Pickles Marsh to link up with other forested trails crossing Denman.

The three major management issues for the Reserve focus on helping to sustain a healthy beaver population, maintaining the trail, and protecting against fire hazards, especially in the context of climate changes that may alter temperature and hydrological regimes. Beavers are essential for the integrity of the marsh, and therefore merit a high level of protection. More woody debris will accumulate as the seral western hemlocks age and die in the centre of the north portion, potentially blocking the trail and contributing to the fire risk. Douglas-fir, grand fir and western redcedar trees in the north portion will continue to gradually replace the western hemlocks, although with a warmer, drier climate the climax species composition may change.

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Acknowledgements

The Inner Island Nature Reserve was both Denman Island's and the Islands Trust Conservancy's first nature reserve. Since 1992, the property has been protected, managed, and monitored by many individuals and organizations. In particular, the author acknowledges the Denman community members who, starting in 1977 and through the early 1980s, resisted the logging of the forests on the land and supported conservation efforts. Thanks also to the Nature Conservancy of Canada and their various covenant monitors, the Vancouver Foundation, Raven Forest Products, the Islands Trust Conservancy Board, and the Denman Conservancy Association's directors and members. Sandy and Des Kennedy are noted for spearheading the early negotiations for acquisition and protection of the Reserve.

This revision of the management plan benefited from the work completed for the 1994 management plan by J. Ussery, the 2003 baseline report by R. Durand, and the 2005 management plan revision by DCA. Special thanks to the neighbours and community members who reviewed this 2020 revision. As always, my sincere appreciation and apologies to the varied plant and animal occupants of the Reserve for my trampling and voyeurism.

Table 1. Management Plan Contributors

Name	Position/Affiliation	Professional Accreditation or subject expertise	Contribution
Jennifer Balke	Principal, Ecofocus Environmental Consultants	Registered Professional Biologist	Ecological inventory, Trimble and Garmin data collection, GPS mapping, historic data, document additions and review
Don Chamberlain	Biologist, Puntledge River Hatchery	Certified GPS Data Processor/Project Manager	Trimble GPS set up, Trimble data-handling, and post-processing
Louise Bell	Self employed	Editor	Information research and compilation, document assembly and editing
Erika Bland	Land Manager, Denman Conservancy Assoc.	M.A. Environmental Studies (Political Ecology)	Facilitation and write-up of the community consultation, and document review
Jemma Green & Nuala Murphy	Property Management Specialists, Islands Trust Conservancy	M.Sc. Environmental Studies (Restoration Ecology) (J. Green)	Contract supervision and document review
Jackie O'Neil	GIS Technician, Islands Trust		Islands Trust GIS data support
Lisa Wilcox	Senior Intergovernmental Policy Advisor	B.A. Psychology Indigenous Knowledge Holder	Reconciliation/Indigenous Knowledge Holder and editing

Denman Conservancy Association	DCA Lands Committee, DCA Board, neighbours and members of the Denman Island Community	Varied	Contribution to information gathering and document review (DCA Lands Committee and Board)

1 Introduction

The Inner Island Nature Reserve's 9.4 hectares (23.2 acres) are located in the interior of north-central Denman Island, south of Chickadee Lake. The two portions of the Reserve (north and south) are separated by a long, narrow property containing a wetland, which is held by BC Parks. This wetland, known as Pickles Marsh, is nearly 25 hectares (61.8 acres) in size and is maintained by beaver dams (Photo 1) in and immediately adjacent to the Reserve. A portion of Pickles Marsh, three creeks connected to the marsh, and a number of associated wetlands all lie within the Reserve. The Reserve protects mature and regenerating coastal Douglas-fir forests as well as this complex of creek and wetland habitat. The property is a central link connecting the surrounding network of 640 ha of protected lands, which includes the Denman Conservancy Association's 62-hectare Settlement Lands and the Denman Island Park and Protected Area established by BC Parks in 2013.

Photo 1. Beaver dam at mouth of East and Beaver Pond creeks.

(1a) Beaver dam taken March 16, 2019

(1b) Beaver dam taken September 14, 2019

Sla-dai-aich/Ihaytayich (Denman Island) is situated within the traditional and treaty territories 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 and its partners. Protection of the biodiversity and the integrity of the forest and freshwater systems in Inner Island Nature Reserve has long been important to Denman Islanders and now involves a variety of partners. In the 1970's, the Vancouver Foundation sold the land comprising the Reserve to Raven Forest Products, while they donated the portion containing Pickles Marsh and a 200 foot buffer to the Province. The vision of Denman Island Ratepayers and Residents Association and the Islands Trust was that the entire 87 acre property would become a Nature Reserve. In 1992, the Denman Conservancy Association (DCA) purchased the Reserve land with the help of the Vancouver Foundation and then donated it to the Islands Trust Fund (now the Islands Trust Conservancy (ITC)). DCA and ITC were soon joined by the Nature Conservancy of Canada, which, in 1995, agreed to hold a conservation covenant on the Reserve.

The broad conservation view for the area was captured in the Reserve's first Management Plan, dated 1994, which covered not only the Reserve but also the adjacent parcels of marsh and provincially managed land. The first revision, dated 2005, applied to the same area. Since the creation of the Denman Island Park and Protected Area, however, the need to include the adjoining lands is alleviated, and so this document, representing the second revision of the Management Plan, covers only the 9.4 hectares of the Reserve.

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 local 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 2019a)

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 the ITC is one of the corporate entities[2] charged to uphold the Object of the Islands Trust. Since 1990, the ITC has protected over 1,300 hectares (3,220 acres) of land as nature reserves and conservation covenants.

The vision of the ITC is that the islands and waters of the Salish Sea will be a vibrant place 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 preserves 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 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 by:

- providing general and descriptive information on the property, including location, history, and land use;
- setting out the conservation goals and objectives for the property;
- identifying the ecological and/or cultural values and features of the property;
- describing the management issues associated with the property; and
- providing 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.

Once the management plan process is completed, the ITC works to carry out the management actions or strategies identified in the plan, as resources allow. Following general practice and as outlined in the conservation covenant and statutory right of way, the ITC revises the Management Plan every ten years.

1.3 The Scope of Islands Trust Conservancy Management Plans

Consistent with the Islands Trust Reconciliation Declaration (Islands Trust 2019b), the ITC recognizes that nature reserves may be places of great cultural and spiritual significance to First Nations. Cooperative management of these protected places will

[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.

provide opportunities to establish and maintain mutually respectful relationships between the 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 Inner Island Nature Reserve is to preserve, in perpetuity, the mature Douglas-fir forest, marsh, creeks, and other natural values of Reserve and to maintain the biodiversity of the site for the benefit of the flora and fauna of the reserve, the residents of the island, First Nations, and the province generally. The property will be protected as a nature reserve in accordance with the objectives of the Islands Trust and the ITC.

1.5 Protected Area Objectives

The objectives for the Inner Island Nature Reserve are to:

1. Preserve and protect the ecological communities, biological diversity, species at risk and natural values of the Reserve;
2. Restore plant and animal communities and ecological process where necessary;
3. Allow for low-impact pedestrian access and nature enjoyment of the site in areas where such uses are appropriate and compatible with protection of ecological values and in compliance with the conservation covenant held by Nature Conservancy of Canada;
4. Support and protect continued use of areas of sacred and cultural significance by First Nations as per Section 35 of the Constitution Act[4] and UNDRIP;
5. Support ongoing inventory, mapping and monitoring to guide management actions, provided these human activities do not negatively impact native species or the natural ecological functioning of 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 existing aboriginal and treaty rights of the aboriginal peoples of Canada and the courts have stated that aboriginal rights include aboriginal title.

6. Allow the natural ecological processes and functions of the site to proceed unimpeded, except in the case of wildfire or other exceptional situations where remediation is considered imperative; and
7. Remove invasive species throughout the reserve where they compromise natural values.

2 Property Information

Inner Island Nature Reserve is a 9.4-hectare (23.2-acre) property situated in north-central Denman Island (Figure 1). The Reserve is made up of two separate pieces of land that lie on either side of an irregularly-shaped wetland called Pickles Marsh, which is now part of the Denman Island Park and Protected Area. The north portion is approximately 6.5 hectares (16.1 acres) in size and lies on the east side of the marsh. Pickles Road cuts through the north portion and continues southwest to cross the marsh at Pickles Road bridge. The south portion is approximately 2.9 hectares (7.2 acres) in size and forms a triangle near the west side of the marsh, with Pickles Road arching along its western boundary.

2.1 Location

To access the Reserve from the BC Ferries Terminal at Denman West, go up the hill travelling east for 0.4 km on Denman Road. At the intersection at the top of the hill, bear right and travel 0.5 km on Denman Road to the fork at Lacon Road. Bear left and continue east on Denman Road for 1.0 km, travelling up “the big hill.” At the top, turn left (north) on Pickles Road and travel 1.0 km to cross the Pickles Road bridge. The entrance to the Reserve and to the trail in the north portion (Photo 2) is on Pickles Road, about 125 m east of the bridge.

2.2 Legal Description

The north and south portions of the Reserve constitute one parcel, PID 018-012-256. The Inner Island Nature Reserve is legally described as Lot A, Section 21, Denman Island, Nanaimo District, Plan VIP55499. A conservation covenant held by the Nature Conservancy of Canada covers the entire property.

2.3 Legal Access

Legal access to the property is through the entrance to the trail, which is off Pickles Road, approximately 125 m east of the bridge over Pickles Marsh.

2.4 Landscape Context

Denman Island is situated in the Strait of Georgia, just over one kilometre from the east coast of Vancouver Island. The northern tip of Denman is approximately eight kilometres south of the shore of the city of Comox, in the Comox Valley on Vancouver Island (Figure 2). The Reserve is situated in the middle of Denman Island, just north of Denman Road, which spans the width of the island near its centre.

Denman Island is within the traditional and treaty territories of Cowichan, Halalt, Homalco, K'ómoks, Klahoose, Lyackson, Penelakut, Qualicum, Shíshálh (Sechelt), Snaw-naw-as (Nanoose), Snuneymuxw (Nanaimo), Tla'amin, We Wai Kai (Cape Mudge), Wei Wai Kum (Campbell River).

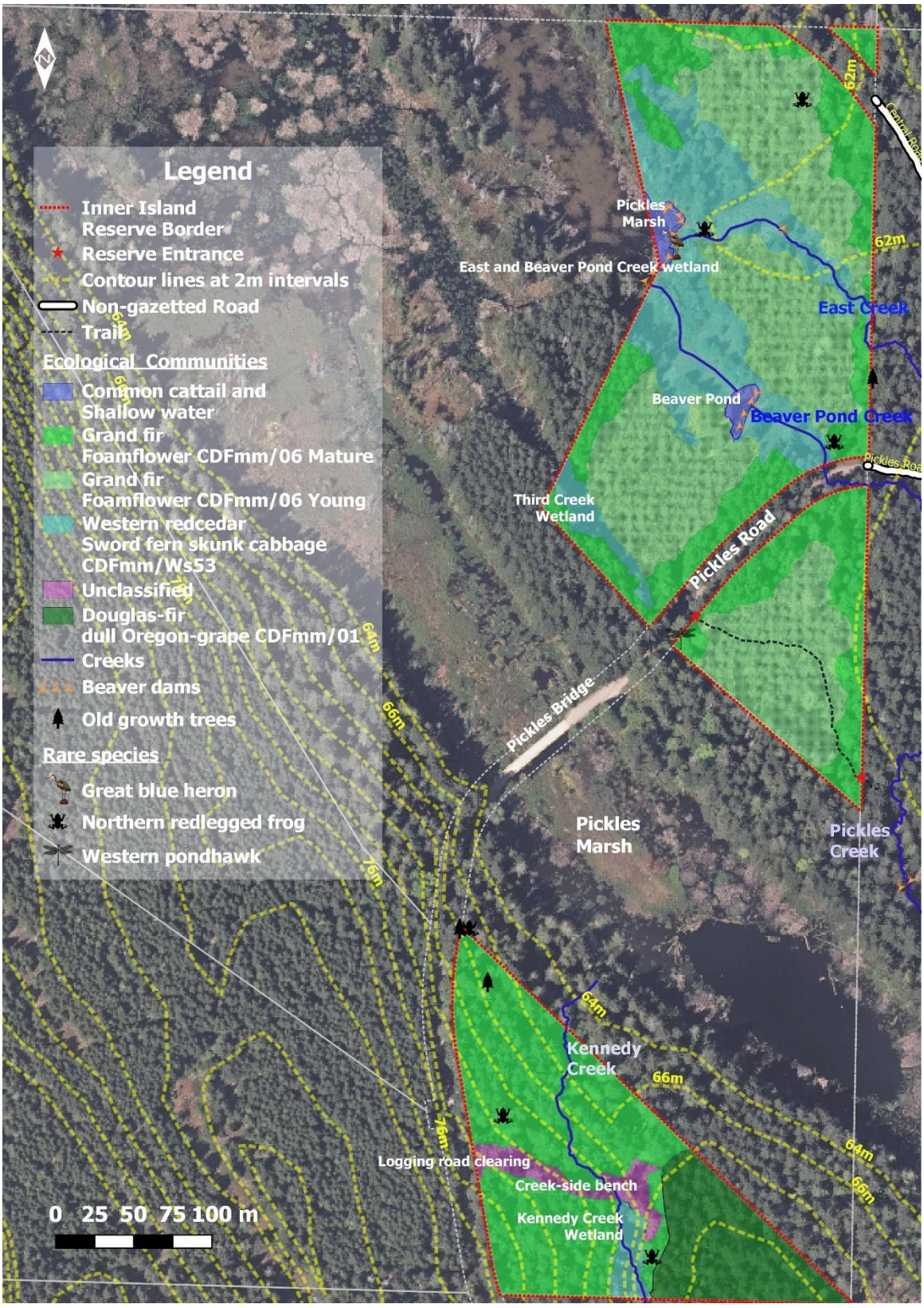

Figure 1. Major features in the Inner Island Nature Reserve.

Photo 2. Entrance to Inner Island Nature Reserve walking trail.

Figure 2. Location of the Inner Island Nature Reserve.

The Reserve contributes to 640 hectares (1580 acres) of contiguous protected lands on Denman Island (Figure 3). The Settlement Lands property, held by DCA, neighbours the northern boundary of the north portion of the Reserve. The rest of the north portion is surrounded by the Denman Island Park and Protected Area held by BC Parks, except for the northeast corner, which abuts an 8-hectare (20-acre) farm in the Agricultural Land Reserve. The south portion is bordered by a variety of lands. To the west of Pickles Road are two 16-hectare (40-acre) properties zoned 'Forestry'; at the southwest corner is a 16-hectare (40-acre) property zoned 'Rural Residential'; to the south is a 4-hectare (10-acre) property zoned 'Rural Residential'; on the southeast corner is a 44-hectare (108-acre) property in the Agricultural Land Reserve; and on the diagonal northeast border is the Denman Island Park and Protected Area. The land use zoning of lands adjacent to the Reserve is shown in Figure 4.

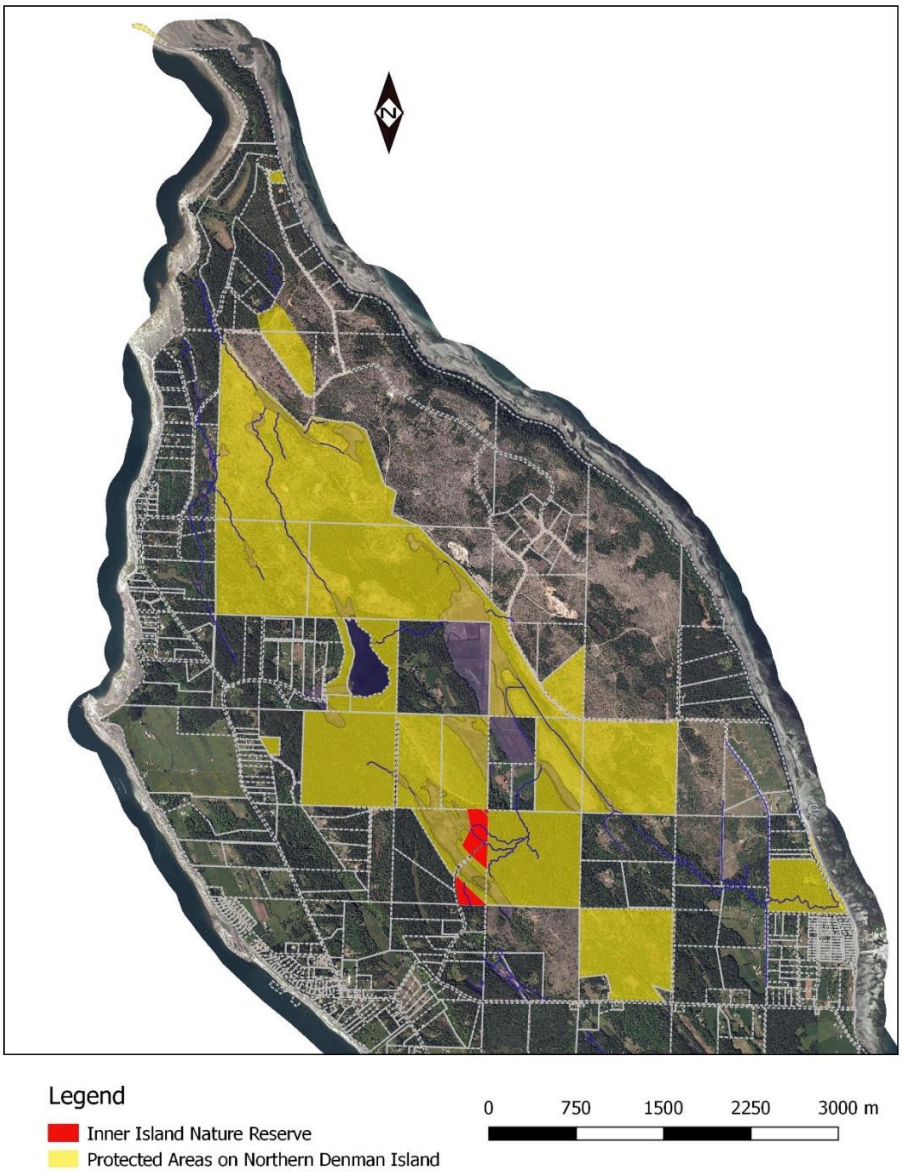

Figure 3. Protected Lands on northern Denman Island.

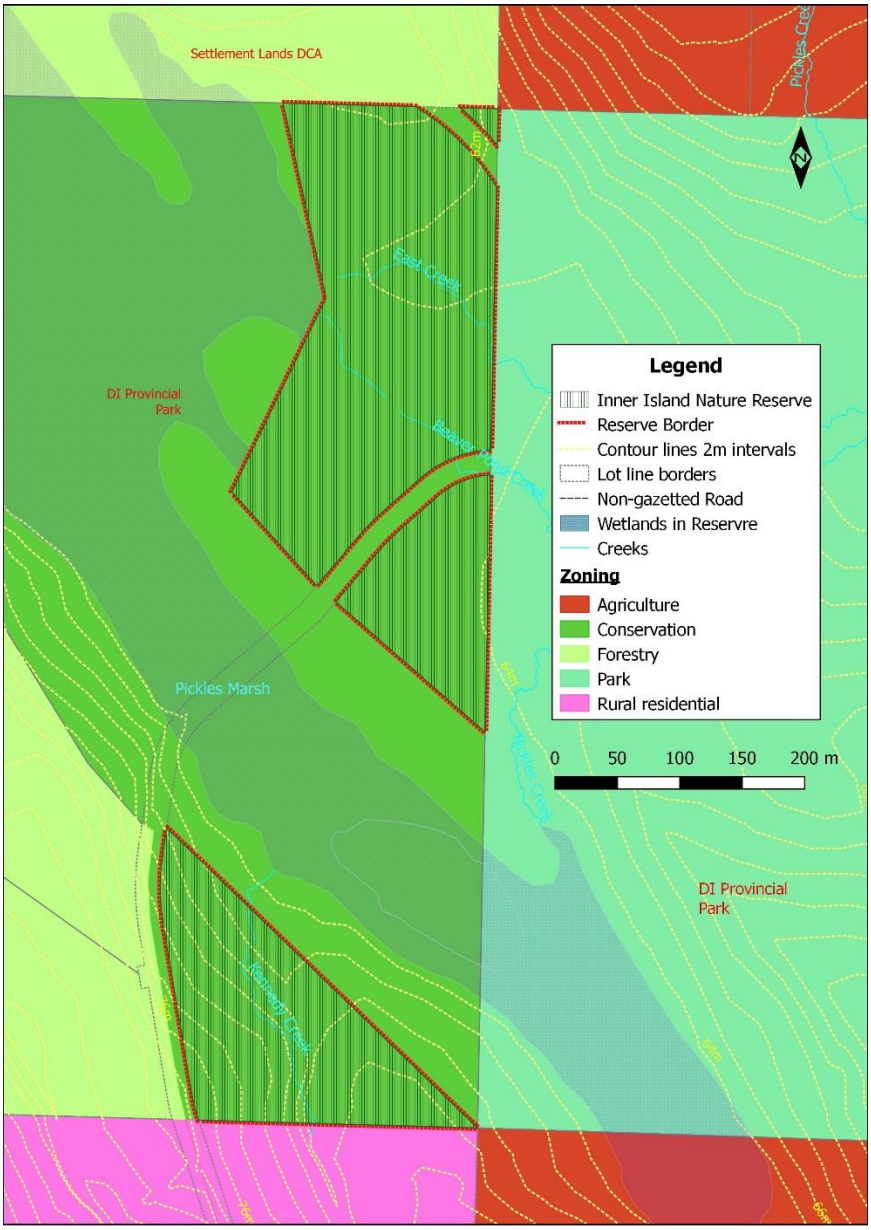

Figure 4. Land use zones of lands adjacent to Inner Island Nature Reserve.

The Reserve is part of a beaver-created wetland complex that contributes significantly to the major, salmon-bearing Beadnell Creek system. On the north side of the north portion of the Reserve, one lobe of Pickles Marsh curves for approximately 60 m into the Reserve, where a beaver dam (Photo 1[5]) crosses the mouths of East Creek and Beaver Pond Creek. Otherwise, a narrow buffer of forest or creek-side wetland separates the marsh from the Reserve. Another beaver dam, beyond the southeast corner of the north portion, drains into Pickles Creek. East Creek and Beaver Pond Creek flow from the east side of Pickles Marsh through the north portion of the Reserve into Pickles Creek, which joins Beadnell Creek, flowing to the sea. Kennedy Creek drains

[5] Documentation for all photographs is included in Appendix 1.

through the south portion of the Reserve and into the west side of Pickles Marsh. In total, over 500 m of creeks flow through the Reserve; the land is flat, so flooded wetlands surround these creeks for most of the year.

The property also links to Pickles Road Trail, a two-kilometre walking trail from the Denman Island Old School Centre on Denman Road to Pickles Road. The trail goes through Central Park, a conservation and recreation parcel in the middle of the island held by DCA, to the Reserve border. Walkers may use the approximately 150-m trail through the Reserve and then cross the DCA Settlement Lands, circle the east side of Chickadee Lake, and continue farther north in the Denman Island Park and Protected Area.

2.5 Site History

Denman Island is located within the treaty and traditional territories of the Coast Salish People and the Kwakwaka'wakw. The island has since time immemorial been the homeland and gathering place for First Peoples including the Cowichan, Halalt, Homalco, K'ómoks, Klahoose, Lyackson, Penelakut, Qualicum, Shíshálh (Sechelt), Snaw-naw-as (Nanoose), Snuneymuxw (Nanaimo), Tla'amin, We Wai Kai (Cape Mudge), Wei Wai Kum (Campbell River); this rich history and cultural heritage continues to this day.

tuwa akʷs χoχoɬ ʔa xʷ yiχmɛtɛt (ʔa) kʷʊms hɛhaw tʊms gʊ̆jɛ
"Care takers of the 'land of plenty' since time immemorial"

For thousands of years Indigenous People occupied the shoreline of eastern Vancouver Island in a place referred to as, "the land of plenty". This Land of Plenty stretched from what is known today as Kelsey Bay south to Hornby and Denman Island and included the watershed and estuary of the Puntledge River.

The K'ómoks First Nation is located in the heart of the Comox Valley on Vancouver Island. Membership is currently 336 members within four clans: Sathloot, Sasitla, leeksun or Eiksan and Puntledge. Two cultures are identified in their community: Coast Salish (Island-Comox speaking peoples and Pentlatch-speaking peoples) and Kwakwaka'wakw (Kwak̓wala speaking peoples). K'ómoks people originally occupied sites in Kelsey Bay, Quinsam, Campbell River, Quadra Island, while Pentlatch people occupied sites around Comox Harbour, Baynes Sound and Hornby and Denman islands (source: K'ómoks First Nation).

Oral history and archaeology describe a rich and bountiful relationship between the K'ómoks and Land of Plenty. Salmon, seal, octopus, herring, cod, deer, ducks, shellfish and a plethora of berries filled the tummies of the young and old alike. The technologies that were applied in harvest, preparation and cultivation of local resources were appropriate to the environment, resource and spiritual beliefs. Fish weirs, duck nets, berry picking techniques and clothing design met the needs of the K'ómoks and for generations provided variety, utility and sense of cultural uniqueness. Mask dances and

rhythmic songs filled the winter nights and season. Property was distributed to guests in potlatches and elaborate naming ceremonies honoured the youth, leaders and elders of the communities.

Following contact with Europeans northern groups started a southerly move into K'ómoks territory. A period of conflict displaced the K'ómoks southward to their relatives the Puntledge. Followed by a period of colonial policy and practices, the K'ómoks families have endured hardship and loss of land, resources and cultural connection. Modern leaders are striving to reclaim cultural expression and relationship to the "the land of plenty". According to Island Comox cultural traditions, the origin of the people began at the meeting of the Quinsam (kwaniwsam) and Campbell Rivers. Mary Clifton, the last speaker of the Island Comox dialect, has conveyed the origin story of a man named Shalhk'em and woman named Tisitl'a that "dropped down from the sky" at kwaniwsam (Quinsam) in present-day Campbell River. With them, they brought the mask and garments of the Xwayxway and together became the first ancestors of the Island Comox people. For the descendants of the Shalhk'em and Tisitl'a, kwaniwsam remains the central location in which Island Comox territory moves outward to Salmon River in the north, Cape Lazo in the south, and the islands in the Salish Sea (formally the Strait of Georgia) (K'ómok Nation webpage).

At this time no archeological impact assessment or cultural knowledge inventory has been conducted within the Reserve.

There is no record of post-colonization settlement on the Reserve land. Nor are there any structures on the land. The logging history includes early high-grade logging of first-growth Douglas-fir, grand fir, and western redcedar prior to the 1930s. Springboard-notched stumps from this logging are still visible throughout the Reserve (Photo 3). An active sawmill was located to the east of the Reserve, and the remains of parallel mounds from the early logging, using a 'humdergen' railroad system (Isbister 1976), can be seen outside the northwest border of the Reserve. Remnants of what appear to be other railway mounds were observed in the south portion of the Reserve during the ecological inventory (Photo 4). Two parallel mounds are visible for at least 10 m-long on either side of Kennedy Creek. Unfortunately, much of mound area is very overgrown. Also, a small flat non-treed area along Kennedy Creek, referred to in this plan as the 'creek-side bench', was described as being tree-less in 1971 and having, at that time, the current shallow well and both a small garbage dump and a wooden structure consisting of a high cross beam supported by cedar posts (personal communication, D. Kennedy).

Photo 3. Burnt springboard stump.

Photo 3. Possible railway logging mounds.

The ecological values of this area of Denman Island were documented over forty years ago (Kennedy and Roberts 1977), and then again in 1988 (Kennedy and Willis 1988). Later, Kennedy (1993) reviewed the original land tenure and history of the area, which follows.

The SE ¼ of Section 21, which contains what became the Reserve portions, was originally part of Comox Logging's privately-owned tree farm holdings on Denman Island. These holdings were included in the will of R. J. Filberg and were donated as part of his 10,000-acre bequest to the Vancouver Foundation (Vancouver Foundation 1977). Later, in the 1970s, at the request of the Islands Trust and the Denman Island Ratepayers and Residents Association, the Vancouver Foundation gave Pickles Marsh, plus a 200-foot buffer of 25.6 hectares (56.4 acres) known as "Lot 1," to the Province, with the understanding that the title to the property would be passed to the Islands Trust. The Province placed Lot 1 under map reserve to the then Ministry of Environment. The remainder of land in SE ¼ of Section 21 was sold to Raven Forest Products, along with other Denman lands in the original tree farm.

In 1984, Raven Forest Products (RFP) logged parts of the north portion of the future Reserve. Strips of mature trees were left along both sides of Pickles Road and along part of the northwest boundary of the Reserve near Pickles Marsh. A few second-growth cedars were also left within the logged area. Then, in 1990, a contractor for Raven Forest Products began constructing a logging road in the south portion of the future

Reserve. This renewed the concerns held by the Denman community and re-started discussions regarding the possible purchase and protection of the land.

After negotiations with the Denman Island Ratepayers and Residents Association and the DCA, RFP agreed to make Lot A, the future Reserve, available for purchase. The Agricultural Land Commission allowed the separation of these pieces from the rest of the RFP land around Pickles Marsh, which was in the Agricultural Land Reserve, on the condition that Lot A and Lot 1 would be consolidated by the Ministry of Environment and the Islands Trust. In December 1992, with help from the Vancouver Foundation, DCA purchased the 9.4-hectare Lot A, which was then donated to the ITC as a nature reserve, becoming the first property owned by the ITC. Throughout the 1990s, the ITC and the DCA applied multiple times for title to Lot 1 and to the SW1/4 of Section 22 in order to complete the agreement with the ALC. Finally, in 2013, the protection of Lot 1 in the Denman Island Provincial Park and Protected Area achieved this goal.

Evidence of the more recent logging of the Reserve by RFP is still visible. In the northern portion, low-cut stumps are present from the 1984 logging, and the tracks used by the logging equipment are becoming more evident as the 35-year-old young forest matures and the canopy begins to open. In 1990, contractors for RFP constructed a timber bridge (no signs remain) across Kennedy creek at the site of the creek-side bench; presumably the bench was to be used as a log landing. The logging road, constructed to reach this bridge, is now a partially-recovering, young seral-stage forest and is referred to in this plan as the 'logging road clearing.'

2.6 Anthropogenic Features

There are no buildings, structures, or other current modifications in the Reserve other than the walking trail (Photo 5), signage (Photos 6, 7 and 8), and an old well hole on the bench beside Kennedy Creek in the south portion of the Reserve (Photo 9). There are no known archaeological sites. Possible remnants of early 1900s logging-railway mounds or ditching are grown over and barely visible (Photo 4), but springboard stumps from early logging can be seen from Pickles Road; many of these trees are heavily fire-scarred (Photo 3). Anthropogenic features are described in Table 2 and shown in Figure 5.

Photo 4. Trail in Inner Island Nature Reserve.

(5a) Trail near Pickles Road entrance.

(5b) Trail at entrance on southern border.

Photo 5. Conservation sign on Pickles Road.

Table 2. Anthropogenic Features

Feature	Description	Condition / Location	Photo Number
Trail	Public walking trail	Hard-pack, earthen, pebble trail, ~40 cm-wide worn surface	Photos 5a and b
Signs	Identification at entrances	In good repair; at trail entrances: Pickles Road and southern border of the north portion	Photo 6
Sign	Information about Reserve. Sign has the allowed uses. Note: An information kiosk could be considered for the entrance off Pickles Road.	In good repair; on post near trail entrance from Pickles Road	Photo 7
Signs	No fires, No tree cutting, No hunting	In good repair; at various locations along property boundaries	Photo 8
Old well	2 x 2 m across, ~ 1 m deep	Dug into dirt at edge of creek, south end of polygon 7 creek-side bench	Photo 9

7a. Sign at entrance off Pickles Road.

7b. Sign at entrance at south end of trail.

Photo 6. Signs at entrances to Inner Island Nature Reserve.

Photo 7. Various signs around the borders of Inner Island Nature Reserve.

Sign	Location UTM Zone 10 Coordinates
No tree cutting	369834 5489980
No hunting	369700 5489674
No hunting	369786 5489758
No hunting	369691 5489687
No smoking No fires	369700 5489674

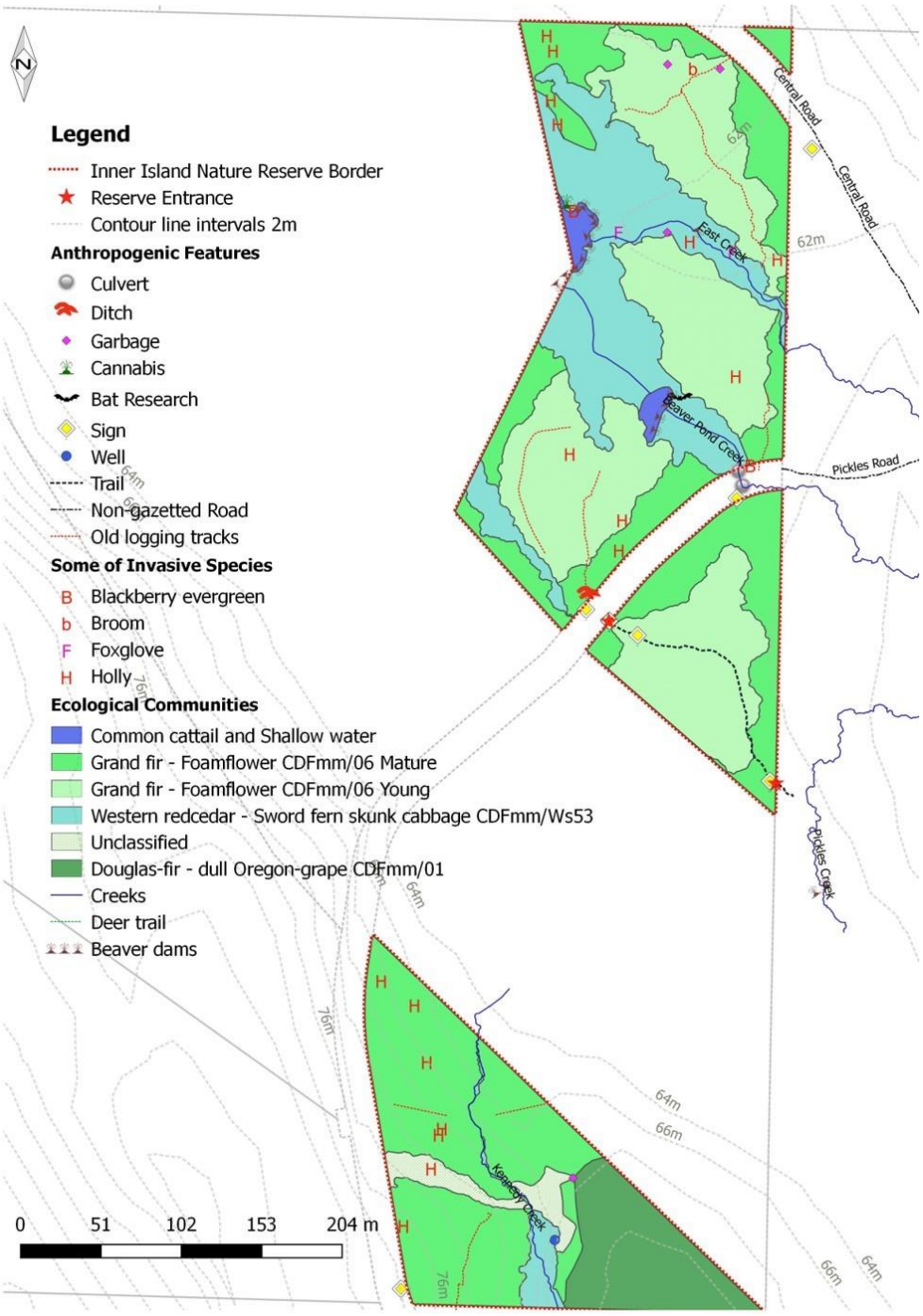

Figure 5. Anthropogenic features and invasive species.

Photo 8. Historic well hole on creek-side bench in the south portion.

2.7 Undersurface Rights

The undersurface rights for Inner Island Nature Reserve are owned by the Province of British Columbia (M76301 and S13080).

2.8 Notations, Charges, Liens and Interests

A Section 215 Covenant (EJ39538) from the Land Title Act was registered in 1995 in favour of Nature Conservancy of Canada. The covenant requires that the land be protected in its natural state in perpetuity, in accordance with a management plan that is to be renewed from time to time. Specifically, the covenant prohibits any disturbance or alteration of the land including, but not limited to: soil disturbance, mineral exploration, tree pruning and removal or other damage to native vegetation, use of biocides, interference with wetlands or water courses, placement of buildings or structures on the land, trail expansion, hunting and fishing, and all such forms of human interference; with the exception of Section 35 rights held collectively by Indigenous Peoples with traditional and treaty territories within the area.

There is also a Section 215 Covenant (EF156078) registered in 1992 in favour of the then Minister of Environment, Lands and Parks and Regional District of Comox Strathcona which restricts buildings or structures.

2.9 Local Planning Designations

The north portion of the Reserve falls within the provincial Agricultural Land Reserve.

The Denman Island Land Use Bylaw (Islands Trust 2017b) zones the Reserve as 'Conservation' (CN). The Denman Island Official Community Plan (Islands Trust 2017a) designates the land use for the property as 'Conservation/Recreation.' The primary objectives of this designation is to protect to conserve Denman's biodiversity by

protecting sustainable populations of all species native to Denman Island's Coastal Douglas Fir Biogeoclimatic Zone and their natural habitats.

A Development Permit Area for Riparian Area Regulation (RAR) Streams, Lakes and Wetlands covers about one quarter of the north portion of the Reserve, and almost all of nearby Lot 1. The primary objectives of this designation is to protect the biological diversity and habitat values of riparian and aquatic ecosystems; to protect the natural environment necessary to conserve productive fish habitat, including both streams and the adjacent land and vegetation; to prevent the degradation of existing and future water supplies on Denman Island; to minimize adverse impacts of land use practices on wildlife habitats and plant habitats in riparian areas; and to prevent water pollution.

2.10 Existing Public and Other Use

Inner Island Nature Reserve falls within the territory of multiple First Nations, and as such has been a site of cultural activity for thousands of years. There is knowledge and oral history relating to this site that may or may not be shared outside of the membership of a First Nation. As a first step toward strengthening cultural connections to the land that were negatively impacted by European settlement, ITC is exploring the potential of a Management Plan for *Areas of Cultural Heritage and Sacred Significance* that will support and enhance the continued use of the site by First Nations.

Most public use of the Reserve takes place on the Reserve's single trail (Figure 5), which is in the north portion south of Pickles Road, and focuses on hiking and quiet appreciation of nature. The trail begins at Pickles Road, approximately 125 metres northeast of the bridge over the marsh, and travels south to meet the Pickles Road Trail. A trail network then connects the Pickles Road Trail to the main entrance into Central Park on Denman Road, opposite the Marcus Isbister Old School Centre. This scenic forested trail network is popular with hikers seeking a relatively long walk.

The Reserve trail used to be the only route linking the Pickles Road Trail to Pickles Road. Earlier, horseback riders occasionally used the Reserve trail to make this connection, but this use was stopped about 10 years ago when a trail suitable for horses was constructed around the Reserve land, providing a second link to Pickles Road.

Other than walking on the Reserve trail, there is little public use of the Reserve. Old tracks from logging activities are barely visible and are mainly used by deer. In the south portion, a prominent deer trail leads across the Reserve to Pickles Marsh (Photo 10). Occasional illegal uses have included logging along the reserve edge and cannabis growing adjacent to the marsh (Photo 11). Signage at the trail entrance in the north portion of the Reserve directs visitors to keep dogs on leash, refrain from horseback riding, and forbids hunting.

Photo 9. Deer trail in the south portion.

Photo 10. Illegal cannabis plantation in Pickles Marsh edge

Parking space on Pickles Road is limited, as this road was designated as a Heritage Road in a 1992 agreement between the Islands Trust and the then Ministry of Highways. A small pull-off area immediately northeast of the Pickles Road bridge accommodates three vehicles at most. Additional vehicles must park along the side of the road.

3 Ecological Inventory

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.

3.1 Ecological Significance

The two portions of the Inner Island Nature Reserve provide a critical forest buffer on either side of Pickles Marsh, which drains through the Reserve and supplies Denman's major salmon-bearing system. The forests offer diverse structural elements and plant species, with large, approximately 100-year-old Douglas-fir forests (*Pseudotsuga menziesii*), at least one massive veteran tree that is 300+ years old, and late seral pole-sapling/early young forests. The three creeks and adjacent wetlands within the Reserve add to the diversity. These wet and edge habitats include a variety of fruiting shrubs that benefit many bird and insect species. Large coarse woody debris (CWD), huge snags, and dead and dying seral red alder (*Alnus rubra*) and western hemlock (*Tsuga heterophylla*) trees provide habitat for cavity nesters, the amphibian community, and a host of invertebrates and their predators. Together, these forests form a significant part of the 'interior forest' habitat that exists within the surrounding protected area network.

Three rare species and three rare ecosystems were identified in the Reserve during the ecological inventory (Tables 3 and 4) and an additional 11 rare species may be present in the Reserve based on previous sightings or their known presence in similar habitats nearby (see Appendix 2).

Table 3. Rare species identified in Inner Island Nature Reserve, February–June 2019

Species Name		Status				
Common	**Scientific**	**Provincial***	**BC List****	**Global^**	**COSEWIC^^**	**SARA~**
Northern Red-legged Frog	*Rana aurora*	S3 (2016)	Blue	G4 (2015)	SC (2015)	1-SC (2005)
Western Pondhawk Dragonfly	*Erthemus collocata*	S3S4 (2015)	Blue	G5 (2016)		
Great Blue Heron, *fannini* subspecies	*Ardea herodias fannini*	S2S3B,S4N (2018)	Blue	G5T4 (2016)	SC (2008)	1-SC (2010)

*, **, ^, ^^, ~ Species status rankings are explained in Appendix 2.

Table 4. Rare ecological communities in Inner Island Nature Reserve, February –June 2019

Ecological Community Name		Status		
Common	**Scientific**	**Provincial***	**BC List****	**Global^**
Douglas-fir / dull Oregon-grape (CDFmm/01)	*Pseudotsuga menziesii / Berberis nervosa*	S1 (2018)	Red	G2

Grand fir / three-leaved foamflower (CDFmm/06)	*Abies grandis / Tiarella trifoliata*	S1 (2013)	Red	G1
Western redcedar / sword fern - skunk cabbage (CDFmm 11/Ws53)	*Thuja plicata / Polystichum munitum - Lysichiton americanus*	S3? (2012)	Blue	GNR

*, **, ^ Species status rankings are explained in Appendix 2.

3.2 Climate

The climate on Denman follows a pattern of warm, dry summers and mild, wet winters. Denman is in the rainshadow of the Vancouver Island mountains, and the moisture deficit is most pronounced in the summer months. Temperatures are moderated by the maritime influence; consequently, the climate in the Strait of Georgia region is generally the mildest in Canada. Being centrally located on Denman, the Reserve is fairly sheltered from both the sea's moderating influence and marine storms. Nevertheless, the large amount of surface water within and around the Reserve moderates the local micro-climate.

Data on the average climatic conditions within the Reserve were obtained from the 1981–2010 Canadian Climate Normals for the Comox weather station, which is located approximately 20 km north of the Reserve. Precipitation averages approximately 1.1 m annually, most falling from October through March and nearly all falling as rain (Figure 6) (Environment and Climate Change Canada 2019). The warmest period is July and August, with long-term normal maximums of less than 23°C. Long-term minimums from December through February are above 0.5°C. A warming, drying climate will probably have less immediate impacts on the low lying, moist forests of the Reserve compared to upland areas.

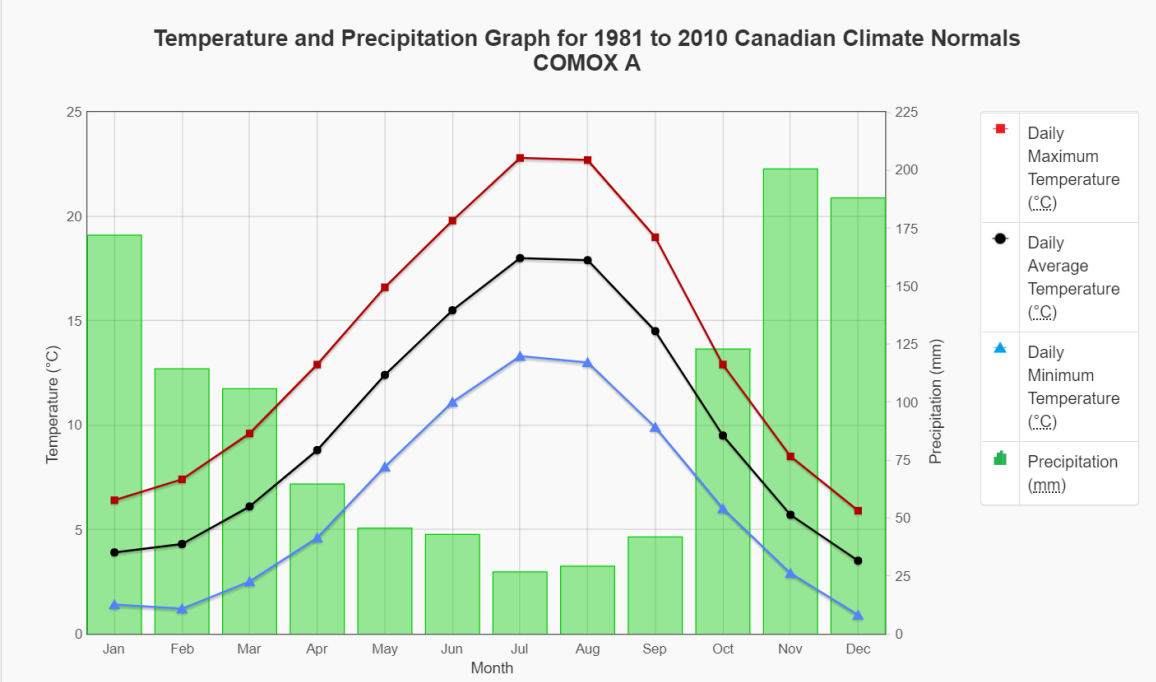

Figure 6. Temperature and precipitation averages for Comox Weather Station, located approximately 20 km north of the Reserve.

3.3 Geology and Physiography

Sediments of the Nanaimo Group underlie all of Denman Island. They are considered to have been deposited as submarine fan complexes deep in the early marine environment some 55 and 87 million years ago (Mustard et al. 1999). The Reserve is mapped as sitting over the De Courcy sediment formation, right near the junction with the overlying Northumberland formation (Katnick and Mustard 2002). The De Courcy formation is made up of thick alternating beds of sandstone and conglomerate, while the Northumberland formation consists of mudstone interbedded with siltstone and sandstone.

The north portion of the Reserve is essentially flat. There are hummocks periodically throughout, probably due to uprooted, long-dead trees, and the land has an almost imperceptible slope of approximately 1–2% along the creeks. The north portion lies between 62 and 64 m above sea level. The south portion of the Reserve has steeper slopes in several directions. The land has an overall slope down, towards the north, of approximately 8% from the highest point at 77 m to the lowest at 65 m. The land also slopes down on either side of Kennedy Creek, 16% from the west side and up to 37% from the east side. The southeast portion slopes about 10% in a bowl towards the northeast (60°). In the south portion of the Reserve there is a broad-flat area, about 25-metre wide, that starts at a bench along the east side of Kennedy Creek and runs to Pickles Marsh.

3.4 Hydrology

The Reserve includes a complicated network of creeks, beaver dams, and impounded wetlands (Figure 7). There are three active creeks and one marsh/swamp (a former creek) in the Reserve. East Creek (Photo 12) flows on the east side of the north portion of the Reserve for about 180 m. The creek begins at the 60-m-long beaver dam on Pickles Marsh (Photo 1), flows through flat wetlands where there is at least one old beaver dam, and then flows into the provincial park. Beaver Pond Creek (Photo 13) also starts at the beaver dam on Pickles Marsh, but the mouth is situated outside the Reserve in the provincial park. This creek flows for 161 m through flat wetlands in the Reserve, is impounded by a beaver dam at Beaver Dam pond (Photo 14), and then runs through another flat wetland. It flows out of the Reserve through a culvert under Pickles Road, where it forms a pond in a road-side ditch (Photo 15). The creek continues into the nearby provincial park, the Denman Island Park and Protected Area, where it later joins Pickles Creek, which flows into the Beadnell salmon-stream system. In the early 1990s, a further creek (Third Creek) was identified to the east of Beaver Pond Creek, beginning at an adjacent inlet in Pickles Marsh and flowing 100 m through the Reserve to Pickles Road. Today, this drainage is a sedge swamp (Photo 16), with no surface-water outlet at the road. In the south portion of the Reserve, Kennedy Creek flows out of a wetland on the southern border of the Reserve, travels 173 m through the Reserve, and empties into Pickles Marsh (Photo 17).

The beaver-impounded Pickles Marsh is a multi-lobed flooded area in the centre of a low elevation basin. A 0.06-hectare portion of Pickles Marsh lies within the Reserve (Photo 18), adjacent to a beaver dam just inside the Reserve's north border (Photo 1). The water from Pickles Marsh drains through this beaver dam at the northern border of the Reserve into the Reserve's two creeks, East Creek and Beaver Pond Creek. Also, just outside, beyond the southern border of the north portion of the Reserve, Pickles Marsh flows through another beaver dam into Pickles Creek. Two other beaver dams in the Reserve are a small dam on East Creek and a larger dam that creates the pond on Beaver Pond Creek. The flatness of the terrain, together with beaver activities, has resulted in about 1.4 hectares (3.5 acres) of wetland/swamp habitat surrounding the creeks in the Reserve's north portion. In the south portion, the narrow valley along Kennedy Creek has another 0.07 hectares (1.7 acres) of wetland habitat.

12a. Old channel at edge of wetland.

12b. Central channel.

12c. Channel at edge of young forest.

12d. Channel entering mature forest.

Photo 11. East Creek wetlands.

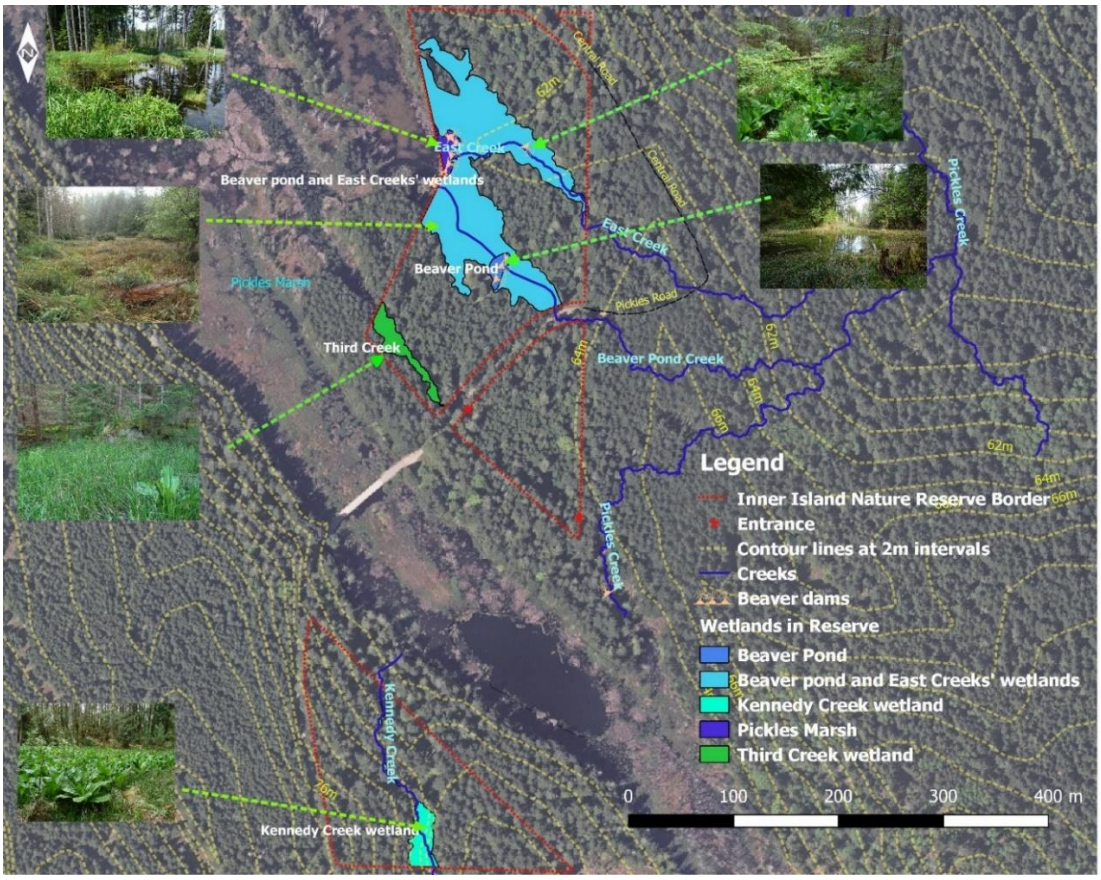

Figure 7. Hydrology of Inner Island Nature Reserve.

13a. Wetlands before pond.

13b. Wetlands after pond.

13c. Reed canary grass area, possible old logging track.

Photo 12. Beaver Pond Creek wetlands.

14a. March 16 taken from northwest.

14b. April 25 taken from south.

14c. May 17 taken from south.

14d. June 9 taken from east side.

14e. June 27 taken from east side.

Photo 13. Beaver Pond on Beaver Pond Creek.

Photo 14. Road-side ditch on Beaver Pond Creek.

Photo 15. Third Creek wetland.

Photo 16. Kennedy Creek wetland.

18a. May 17 taken from east side.

18b. June 9 taken from east side.

18c. September 14 taken from east side.

18d. Pickles Marsh from dam at south end.

Photo 17. Pickles Marsh in the Reserve.

3.5 Soils

The north portion of the Reserve is flat and lies at the bottom of a broad basin that likely collected eroded soil and nutrients, as it has rich soils that provide good growing conditions for trees. The soil in the north portion is shown as 'best soils' in the large-scale Denman Farm Plan map (Figure 8; Islands Trust 2012). As this basin surrounds Pickles Marsh, the soils of most of the south portion of the Reserve are likely 'best' soil type as well, although the Denman Farm Plan map places the line dividing 'best' and 'poor' right at the marsh. The poorer soils of the Reserve occur in the southeast corner of the south portion.

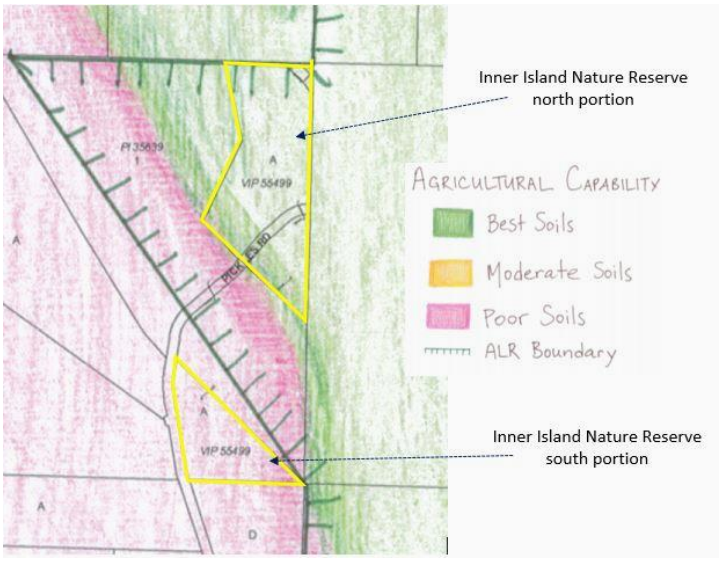

Figure 8. Extract covering the Inner Island Nature Reserve from Islands Trust soil map for Denman Island (Islands Trust 2012).

The provincial government's soil classification map (Figure 9) indicates three soil types under the Reserve (Province of British Columbia 2018). Again, the lines appear somewhat arbitrary. The north portion of the Reserve is mapped as a Bowser soil type, an imperfectly drained sandy loam. The south portion is likely also Bowser in the lower slope and may become Hiller further up the slope. Hiller is also a sandy loam but more rapidly drained. The 'poorest' soil is found on the southeast ridge and is mapped as Royston, an imperfectly drained loam with rock fragments.

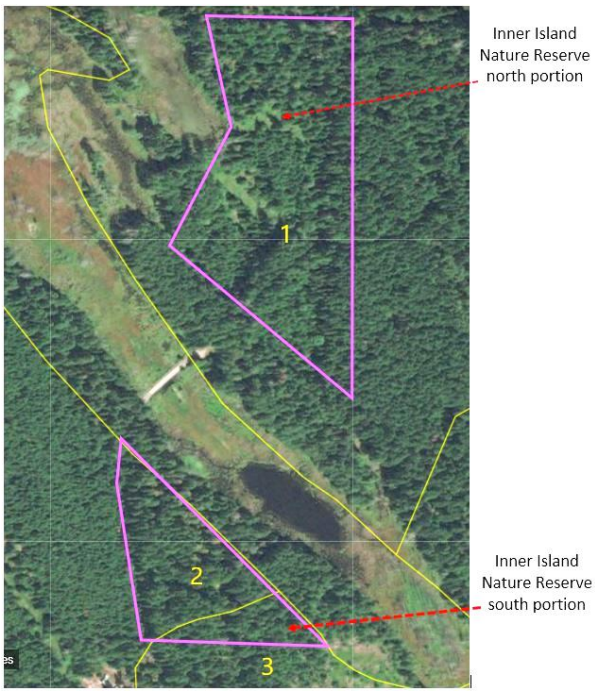

Figure 9. Provincial government soil mapping for Inner Island Nature Reserve. Soil types: 1. Bowser, 2. Hiller, 3. Royston (Province of British Columbia 2018).

3.6 Ecological Classifications

The Reserve is within the national Pacific Maritime Zone and the provincial Georgia Depression Ecoprovince, Georgia Puget Basin Ecoregion, and Georgia Strait Ecosection. The biogeoclimatic zone is Coastal Douglas-fir and the subzone is moist maritime (CDFmm) (Green and Klinka 1984).

The ecological inventory for this management plan was conducted by the author over ten days between late April and July 2019. However, the author has visited this property frequently since 1992. These recent and historic observations build on the documentation in the first management plan (Ussery 1994) used for the original 1995 covenant and the baseline report (Durrand 2003) to update information on the major ecological communities in the Reserve.

Seven ecological communities were mapped (Table 5 and Figure 10): two forest communities, one of which was present at two different structural stages; one distinct wetland community; one mixed wetland community; and two unclassified, recovering, future forest communities. Details of the vegetation in each polygon are provided in Appendix 4.

Most of the Reserve is in Polygon 1 - Mature lowland forest, and is classified as the nutrient-rich, moist grand fir / three-leaved foamflower (*Abies grandis* / *Tiarella trifoliata)* community (CDFmm/06). The south portion of the Reserve comprises mature second-growth forests of this community (Photo 19); a large veteran Douglas-fir (*Pseudotsuga menziesii*) (Photo 20) and several large snags (Photo 21) are all that remain of the original forest. In the north portion, most of this community was logged in 1984 and only a strip of mature forest remains around the border (Photo 22).

The forest in Polygon 2 - Young lowland forest is in a maturing seral stage, with many suppressed and dying western hemlocks (*Tsuga heterophylla*) (Photos 23 and 24). This young forest includes Douglas-fir, grand fir, and western redcedar (*Thuja plicata*) trees that will gradually dominate the canopy. A few larger western redcedars were left during the 1984 logging. The understory of the young forest is poorly developed.

Table 5. Ecological communities in Inner Island Nature Reserve

Polygon Name	#	Ecological Community	Classification	Structural Stage	Provincial Status	Photo #'s
Mature lowland forest	**1**	Grand fir / three-leaved foamflower (*Abies grandis / Tiarella trifoliata)*	CDFmm/06	Mature	Red	4, 19, 20, 21, 22
Young lowland forest	**2**	Grand fir / three-leaved foamflower (*Abies grandis / Tiarella trifoliata)*	CDFmm/06	Maturing seral	Red	5, 23a, 23b, 33
Dry forest	**3**	Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii / Berberis nervosa*)	CDFmm/01	Mature	Red	10, 25
Creeks and associated wetlands	**4**	Western redcedar / swordfern - skunk cabbage (*Thuja plicata / Polystichum munitum - Lysichiton americanus) and Mixed marsh communities*	CDFmm/Ws53	Mature & maturing seral	Blue	12, 13, 15, 16 18, 26 27, 28
Shallow water: a. Pickles Marsh b. Beaver Pond	**5**	Combination of common cattail marsh and shallow water communities (yellow pond-lily and common pondweed)*	CDFmm/ Wm05 and unclassified shallow waters	N/A	Blue and N/A	1, 17a, 17b, 29, 30a, 30b, 30c, 30d
Logging road clearing	**6**	Unclassified [Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii / Berberis nervosa*)]^	CDFmm/01^	Young seral	Red^	24
Creek-side bench	**7**	Unclassified [grand fir / three-leaved foamflower (*Abies grandis / Tiarella trifoliata*)]^	CDFmm/06^	Disclimax	Red^	9, 31

* common cattail (*Typha latifolia*), yellow pond-lily (*Nuphar lutea ssp polysepala*), common pondweed (*Potamogeton natans*)

^ Predicted future community

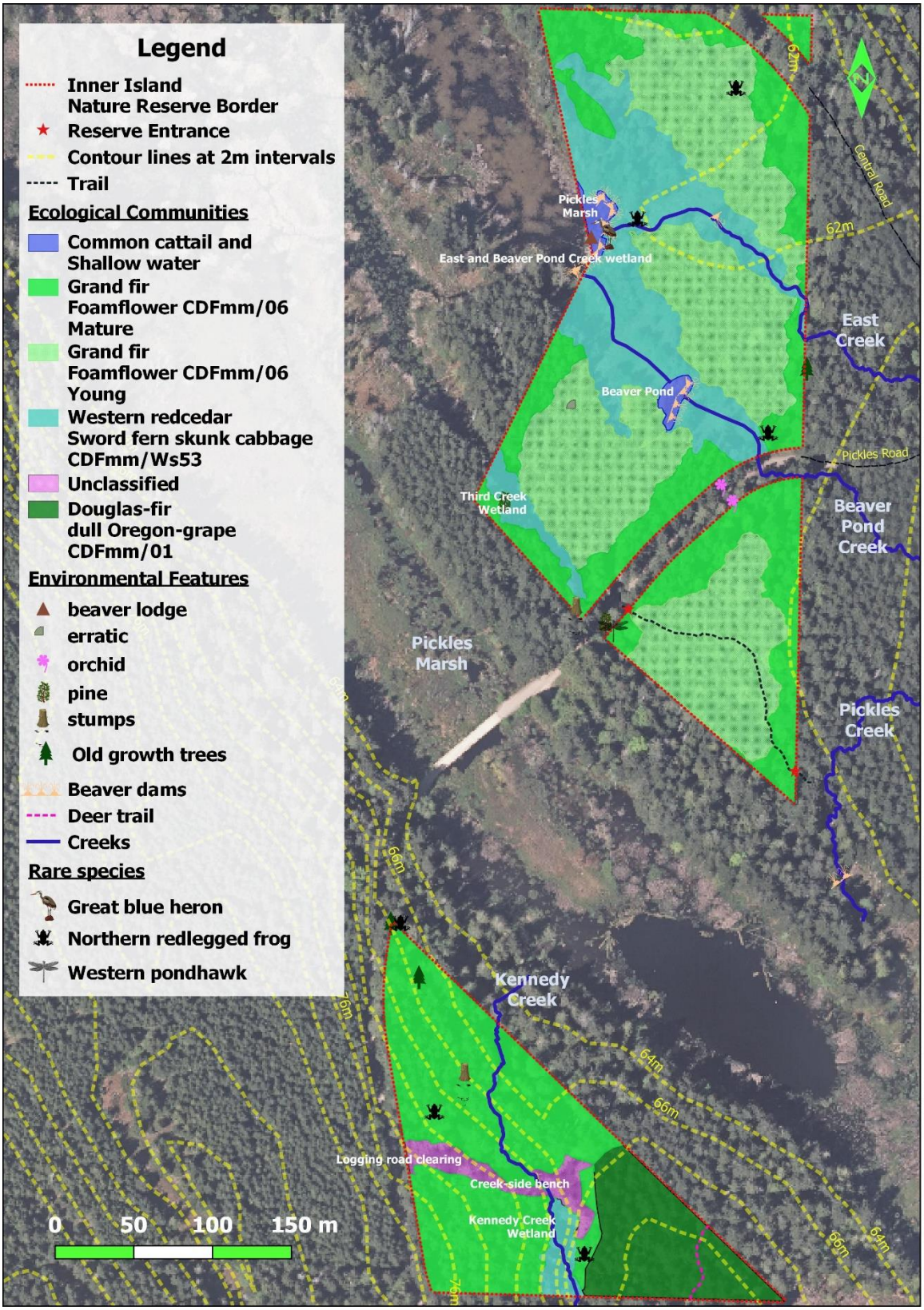

Figure 10. Ecological communities and features in Inner Island Nature Reserve.

19a. Mature forest on slope.

19b. Mature forest near west side of Pickles Marsh.

Photo 18. Mature lowland forest south portion.

Photo 19. Old growth Douglas-fir south portion.

Photo 20. Large dead snag south portion.

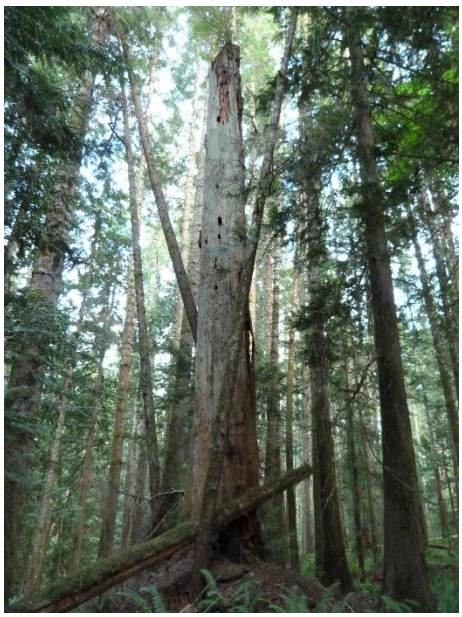

Photo 21. Mature lowland forest north portion.

Photo 22. Young lowland forest, north portion.

Photo 23. Dying Western hemlocks in young lowland forest.

Polygon 6 - Logging road clearing, in the south portion of the Reserve, is a narrow 20-25 m linear corridor within Polygon 1 (Photo 25). Polygon 6 was logged in 1990 to create an access road for further logging. This forest is also in an early seral stage of recovery. Development is limited by the tall surrounding forest and by the damage caused by logging equipment. Impermeable soil, the result of compaction and of the position near the toe of the slope, is likely responsible for the preponderance of moisture-loving species such as lady fern (*Athyrium filix-femina*), deer fern (*Blechnum spicant*), and salmonberry (*Rubus spectabilis*). This corridor will likely develop into the forest community typical of Polygon 1, but at this stage it is unclassified.

Polygon 3 - Dry forest is in the southeast corner of the south portion of the Reserve, where the terrain is elevated on the crest of the eastern slope, and is not in the nutrient-receiving position common to the rest of the Reserve. The forest in this polygon is the drier, medium-to-poor nutrient-level Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii* / *Berberis nervosa*) ecological community (Photo 26). Maturing Douglas-firs,

close to 100 years old, dominate the canopy and salal (*Gaultheria shallon*) is the dominant shrub.

25a. Near Pickles Road.

25b. About halfway to Kennedy Creek.

25c. Nearing the creek on the north side.

25d. From adjacent to Kennedy Creek.

Photo 24. Logging road clearing, south portion. Photos a through d go from near Pickles Road to near Kennedy Creek.

Photo 25. Dry forest, south portion.

Included in Polygon 4 are the Reserve's creeks and associated wetlands (Photos 12-17). In the north portion of the Reserve, some areas are at a maturing seral stage due to damage caused by the passage of logging equipment in 1984. They may also have undergone similar damage in the early 1900s. The wetlands are dominated by sedge, primarily slough sedge (*Carex obnupta*), with skunk cabbage (*Lysichiton americanus*) patches. Portions of these wetlands have disclimax areas invaded by reed canary grass (*Phalaris arundinacea*) (Photo 13c). Beavers eat herbaceous plants, remove trees and shrubs, dig channels, and build dams that create ponds and flooding. These activities will continue to alter the vegetative composition and structure of the wetlands in the north portion of the Reserve.

Polygon 4, in the south portion of the Reserve, comprises the wetlands along Kennedy Creek that have matured without disturbance since the early historic logging (Photo 17). These wetlands are classified as western redcedar / swordfern - skunk cabbage (*Thuja plicata / Polystichum munitum - Lysichiton americanus*) communities.

Polygon 5a - Shallow waters is a small portion of Pickles Marsh, about 0.06 hectares, (Photo 18). This polygon is backed by a large beaver dam and has a narrow rim of common cattail (*Typha latifolia*) (Photo 1); it could therefore be classified separately as a tiny cattail marsh, CDFmm/Wm05. This polygon is next to an unclassified shallow-water area that contains a cluster of yellow pond-lily (*Nuphar lutea ssp polysepala*) and is 85% covered by common pondweed (*Potamogeton natans*) (Photos 27). Beavers travelling and foraging through this area, as observed in March, likely continually change both the physical and the vegetative communities in the area. The dam is close to a beaver lodge, which is within the provincial park boundary.

a. Yellow pond-lily. **b.** Common pondweed.

Photo 26. Plants in the unclassified shallow waters of Pickles Marsh.

Polygon 5b - Beaver Pond is the second shallow-water polygon (Photo 14). This beaver pond is approximately 30 metres in diameter, but varies in size depending on the season and amount of surface water. The pond contains a mix of vegetation, with predominantly yellow pond-lily and several sedges, including slough sedge found around the perimeter.

Polygon 7 - Creek-side bench is a 0.06-hectare (0.15-acre), flat herbaceous community (Photo 28) on the east side of Kennedy Creek in the southeast corner of the Reserve. A logging road was constructed across the creek in 1990 and may have ended within this bench. No subsequent tree growth has occurred. The predominant cover in this polygon is sword fern (*Polystichum munitum*). A square well hole (Photo 9) is located at the south end of this bench. Neighbouring property-holders noted that in the early 1970's remains of an old logging camp were present on this bench. It is likely that the well-hole was dug to serve the camp and the soil compaction and use of the site has retarded the regrowth of forest vegetation.

28a. Bench from the south side.

28b. At the north end of the bench.

Photo 27. Creek-side bench, south portion.

3.8 Wildlife Species

The Reserve provides forest, creek, and wetland habitat for wildlife. The older trees have extensive canopies and large branches suitable for perching, sheltering, nesting, and foraging birds, while the open understory provides a valuable travel corridor for animals, deer browse of understory vegetation may be limiting the growth of certain species. The young forest canopy is just opening up, becoming available to wildlife and allowing understory plant growth, while the dead and dying trees provide important sources of foraging and nesting sites. The marsh edge, three creeks, and extensive, adjacent wetlands are a focus for frogs, aquatic-breeding salamanders, and aquatic insects such as dragonflies and damselflies. The extensive edge of these wet areas is a rich flowering shrub habitat for many species. Pickles Marsh provides a critical reliable drinking water source for wildlife during the summer, and the Reserve shelters wildlife moving to and from the marsh.

Beaver are responsible for the creation and maintenance of the high water levels in Pickles Marsh, and, as a consequence, are essential for maintenance of the downstream wetland habitats. As noted in section 3.4, one of the three major beaver dams holding back the Pickles Marsh water crosses East and Beaver Pond Creeks in the northeast corner of the Reserve. A second dam is just to the west in the provincial park, and the third is on Pickles Creek, immediately adjacent to the southwest corner of the north portion. Beaver have been seen by the author many times in Pickles Marsh (Photo 29a), and were seen foraging around the cattail roots during mapping activities in March 2019.

29a. Beaver in marsh to south of Reserve.

29b. Beaver print in Reserve at edge of Pickles Marsh.

Photo 28. Evidence of beaver activity in Pickles Marsh.

During the inventory, 58 wildlife species were identified in the Reserve: four mammals, 35 birds, three amphibians, and 16 invertebrates (Table 6). Many other species have

been seen in the Reserve at other times, particularly species that are present during other seasons, such as the over-wintering and migrating waterfowl. Trumpeter Swans visit the pond over winter, Barred Owls use the southern portion during mating/nesting season and Belted Kingfishers are regularly seen throughout the summer.

Table 6. Wildlife species identified in Inner Island Nature Reserve during March–June 2019

Common Name	***Scientific Name*** Genus species subspecies	**Type of Record**	**Main Habitat Type**
Mammals			
Black-tailed deer	*Odocoileus hemionus columbianus*	Seen, scat, track	All
Beaver	*Castor canadensis*	Seen, dam	Marsh, creeks
Raccoon	*Procyon lotor*	Track, scat	All, esp. wetland, shore
Red squirrel	*Tamiasciurus hudsonicus*	Seen, midden	All forest
Birds			
American Robin	*Turdus migratorius*	Seen	All
Bald Eagle	*Haliaeetus leucocephalus*	Seen	Forest esp. older, shore
Black-throated Gray Warbler	*Dendroica nigrescens*	Heard	Forest
Brown Creeper	*Certhia americana*	Seen	Forest, bark, snags, cavities
Canada Goose	*Branta canadensis*	Seen	Marsh
Cassin's Vireo	*Vireo cassinii*	Heard	Forest
Chestnut-backed Chickadee	*Parus rufescens*	Seen	Forest
Common Raven	*Corvus corax*	Seen	Forest, esp. older
Common Yellowthroat	*Geothlypis trichas*	Heard	Wetland shrubs
Dark-eyed Junco	*Junco hyemalis*	Seen	Fields, edge, open forest
European Starling	*Sturnus vulgaris*	Egg seen	All, snag nesting
Golden-crowned Kinglet	*Regulus satrapa*	Heard	Forest
Great Blue Heron*	*Ardea herodias*	Seen	Marsh
Hairy Woodpecker	*Picoides villosus*	Seen	Forest
Hammond's Flycatcher	*Empidonax hammondii*	Heard	Forest
Hooded Merganser	*Lophodytes cucullatus*	Seen	Marsh
Hutton's Vireo	*Vireo huttoni*	Heard	Forest
Marsh Wren	*Cistothorus palustris*	Seen	Marsh

Northern Flicker	*Colaptes auratus*	Seen	Forest
Pacific-slope Flycatcher	*Empidonax difficilis*	Heard	Forest
Pine Siskin	*Carduelis pinus*	Heard	Forest
Red-breasted Nuthatch	*Sitta canadensis*	Heard	Forest, snags, cavities
Red-breasted Sapsucker	*Sphyrapicus ruber*	Seen	Forest, snags, cavities, CWD^
Red-tailed Hawk	*Buteo jamaicensis*	Seen	Forest, wetlands
Red-winged Blackbird	*Agelaius phoeniceus*	Seen	Marsh
Ring-necked Duck	*Aythya collaris*	Seen	Marsh
Rufous Hummingbird	*Selasphorus rufus*	Seen	All
Song Sparrow	*Melospiza melodia*	Seen	All
Spotted Towhee	*Pipilo erythrophthalmus*	Seen	All
Swainson's Thrush	*Catharus ustulatus*	Seen	Shrub edge forest
Townsend's Warbler	*Dendroica townsendi*	Heard	Forest
Turkey Vulture	*Cathartes aura*	Seen	Overhead
Varied Thrush	*Ixoreus naevius*	Heard	Forest
Western Tanager	*Piranga ludoviciana*	Heard	Forest
Yellow-rumped Warbler	*Dendroica coronata*	Heard	Forest
Pacific chorus frog	*Pseudacris regilla*	Seen	All
Amphibians			
Northern Red-legged frog*	*Rana aurora*	Seen	Wetland, forest esp. CWD
Rough-skinned newt	*Taricha granulosa*	Seen	All, esp. near water or CWD
Invertebrates			
Anise swallowtail butterfly	*Papilio zelicaon*	Seen	Wetland, creeks
Ant species		Seen	Forest, mounds
Banana slug	*Ariolimax columbianus*	Seen	All, forest
Bluet species damselfly	*Enallagmsa sp.*	Seen	Wetland, creeks, open forest
Cardinal meadowhawk dragonfly	*Sympetrum illotum*	Seen	Wetland, creeks
Chalk-fronted skimmer	*Ladona julia*	Seen	Wetland, creeks, open forest
Common whitetail dragonfly	*Plathemis lydia*	Seen	Wetland, creeks, open forest
Darner (blue-yellow face) dragonfly	*Aeshna sp.*	Seen	Wetland, creeks
Dot-tailed whiteface dragonfly	*Leucorrhinia intacta*	Seen	Wetland, creeks
Four-spotted skimmer dragonfly	*Libellula quadrimaculata*	Seen	Wetland, creeks

Hudsonian whiteface dragonfly	*Leucorrhinia hudsonica*	Seen	Wetland, creeks
Pacific forktail damselfly	*Ischnura cervula*	Seen	Wetland, creeks
Pale tiger swallowtail butterfly	*Papilio eurymedon*	Seen	Wetland, creeks
Robust lancetooth snail	*Haplotrema vancouvernse*	Seen	Forest
Swift forktail damselfly	*Ischnura erratica*	Seen	Wetland, creeks
Western pondhawk dragonfly*	*Erythemis collocata*	Seen	Wetland, creeks, open forest

*Species at risk

^ CWD=coarse woody debris (e.g., fallen trees or branches)

3.9 Expected Change Over Time

As long as beaver are active in the area, marsh water levels and wetland habitats will be sustained. Although organic material accumulates in wetlands, and marshes often fill in over time, beavers tend to disrupt these processes by digging channels, pulling up vegetation, and raising water levels. On the other hand, beaver are vulnerable to disturbance, caused mainly by humans and free-ranging dogs, and beaver dams become weak and change over time. Over the last 30 years, one inlet and creek flowing from Pickles Marsh has diminished in size, but the other creeks and wetlands appear to have been maintained or even enhanced. The current dam at the mouth of East Creek appears to be adjacent to an earlier dam, and remnants of small dams on East Creek suggest that there may have been other beaver ponds. Despite minor changes that are expected to occur in the dams, ponds, and sites with wetland incursion, the area is likely to remain much the same for some time.

The species composition and the amount of forest and wetlands will fluctuate over time. Exotic, invasive reed canary grass has grown up in some of the sunny areas within the wetlands, particularly where logging damage may have occurred. It is possible that this species may be shaded out by tree growth if the beavers allow some wetland trees to grow on the existing hummocks and new mounds created by downed-trees; however, open, sunny, wet areas remain vulnerable to invasion. Other invasive species may increase in number in the forest communities. Although English holly (*Ilex aquifolium*) occurs minimally in the Reserve at this time, holly is spreading across Denman's forests.

The young forest will continue to lose western hemlock (*Tsuga heterphylla*) trees as Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and western redcedar (*Thuja plicata*) become the dominant canopy species, resulting in an accumulation of dead wood debris (Photo 30). The understory of the young forest will develop a herbaceous layer dominated by sword fern (*Polystichum munitum*), vanilla leaf (*Achlys triphylla)*, and foamflower (*Tiarella trifoliata*). In the mature forest, the trees will age

and die, contributing to the forest's coarse woody debris and creating gaps for new trees.

Photo 29. Dead western hemlocks create standing dead woody debris in young lowland forest.

The warming and drying anticipated with changing climatic conditions could have profound effects on the wetland and forest habitats. Evaporation in summer and lower levels of annual rainfall may gradually dry out the edges of the wetlands. Because more trees, shrubs, and herbaceous plants will likely grow on the drier sites, the swamp-like, creek-side wetlands may gradually shrink in size, although the flatness of the land may slow the rate of this change. Accumulation of dead woody debris will increase the risk of wildfire, although once the wood is on the ground in this flat, wet terrain, it may retain considerable moisture and rot fairly quickly. The substantial amount of surrounding, intact forest should help to insulate the Reserve's diverse wildlife and plant communities against the threats that contribute to biodiversity loss.

4 Threats

Threats to various areas of the Reserve are presented in Table 7. Threats stemming from human activities may be somewhat alleviated through education and awareness-raising. These threats include trampling damage due to recreational use of the land, especially off-trail activities; wildlife disturbance, particularly of beaver, due to free-ranging dogs; pollution of surface waters draining into Pickles Marsh or Kennedy Creek; alteration of surface water flow patterns; and human-caused fires (e.g., from burning cigarette butts). Other threats, such as invasive species incursions, will require hands-on

management activities. The local threat to conservation lands posed by climate change is not fully understood as yet, and will require monitoring to assess changes and considerable cooperative planning to address these changes.

Table 7. Current Threats to the Inner Island Nature Reserve

Threats	Polygons			
	Mature Forests	Young forests	Creeks and wetlands	Overall Threat Rank*
Recreational Activities on Trails: Walking poses little threat of trampling or disturbance, as long as visitors stay on the trail. Most of the Reserve is without trails. Attention to accidental invasive species introductions along the trail is warranted.	Low	Low	N/A	Low
Recreation Off Trail: Potential problems with off-trail use include soil compaction (the greatest threat to root health), spread of fungal disease, dispersal of seeds of invasive species, and wildlife disturbance. To date, off-trail activities have not been a major problem in the Reserve.	Low	Low	Low	Low
Free-ranging Dogs: Off-leash, free-ranging dogs are a major disturbance and can be a serious threat to wildlife. Few walkers with dogs use the trail through the Reserve, and although unleashed dogs are taken along the road through the Reserve, they are not a significant problem at this time.	Low	Low	Low	Low
Freshwater Drainage: Contamination of the water and/or reduction of inflow into Pickles Marsh represent threats stemming from activities on private land to the south and west of Pickles Marsh, and from the lots along Kennedy Creek. The lots to the west are undeveloped and those to the south are not a threat at this time. Still, education is warranted for residents living near Kennedy Creek. The provincial park land directly upstream from the Reserve is unlikely to cause drainage changes or contamination, but the threat justifies reminding BC Parks	N/A	N/A	Low	Low

staff of the importance of the integrity of the marsh.				
Fire: Fires could be caused by lightning or by human activity. Wildfire would transform the current ecosystems. Considerable fuel (primarily dead, seral western hemlock) is continuing to accumulate, making high-intensity fires possible. Fire scarring on the old springboard stumps is a reminder of this possibility.	Medium	High	Low	Medium
Invasive Non-native Species: English holly is present as tall plants in the south portion of the Reserve and in a few sites in the north portion. Reed canary grass occurs in some open wetlands. A few small Scotch broom (*Cytisus scoparius*) are present on an old logging road near the Settlement Lands.	Low	Low	Medium	Low
Problematic Native Species: Abundant Black-tailed Deer (Odocoileus hemionus) can be problematic, limiting natural regeneration, dramatically altering understory vegetation structure and composition, and adversely affecting songbird populations (Martin et al. 2011).	Medium	Medium	Low	Medium
Climate Change: Threats from climate change include increased summer temperatures, drought, and more frequent and higher-intensity wind and electrical storms and resulting windthrow and fire impacts.	Medium	Medium	Medium	Medium
Overall Threat Status for Protected Area*	Medium-low	Medium	Medium-low	

*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 only slightly impair the biodiversity target.

4.1 Expected Change to Threats Over Time

As more people use the Reserve, threats from human activities are likely to increase. Problems relating to dogs are increasing at this time and will become a serious ecological threat if dogs are allowed to affect the beaver activities that sustain Pickles Marsh. In fact, the presence of most of the surface water on Denman Island is due to

beaver dams, and so the control of free-ranging dogs is an important issue island-wide. The threat of fire from discarded, burning cigarette butts is also on the rise, partly because forests have been stressed by increasing temperatures and decreasing annual rainfall. Additional development activities, with the associated disturbance of soils and native vegetation, has increased the number and rate of spread of invasive species. Many of these species are increasingly present along roadways and trails, where humans and wildlife act as unintentional dispersal agents.

The threat of wildfire will intensify with the increasing accumulation of dead and dying trees as the seral western hemlock is replaced by the climax Douglas-fir forest. Depending on the rate of climate change the warming and drying of the wetlands may also become a threat to the survival of the species that rely on aquatic habitats for all or part of their life cycle.

5 Community Engagement

5.1 Adjacent Land holders

In preparation for the development of the Management Plan, letters were sent to all landholders and neighbours within a 100 m radius of the reserve. A total of nine letters were mailed on August 21, 2019 (Appendix 4). The letters contained information about Inner Island Nature Reserve, an invitation to a public meeting, and a questionnaire which could be filled in online with SurveyMonkey or on paper and mailed in (see Appendix 5).

Denman Conservancy Association on behalf of Islands Trust Conservancy solicited feedback from neighbouring landholders who volunteered to provide detailed comments on this plan.

5.2 First Nations

Letters were mailed to the following First Nations on October 24, 2019 (Appendix 6):

- Homalco First Nation
- Stz'uminus (Chemainus) First Nation
- Lake Cowichan First Nation
- Halalt First Nation
- Lyackson First Nation
- Penelakut Tribe
- Tla'amin (Sliammon) First Nation
- Snaw-naw-as (Nanoose) First Nation
- K'ómoks (Comox) First Nation
- We Wai Kai (Cape Mudge) First Nation
- Qualicum First Nation
- Wei Wai Kum (Campbell River) First Nation
- Cowichan Tribes

This letter provided information about the Nature Reserve and outlined the proposed management plan.

5.3 Conservation Partners and Community Members

The Lands Committee of Denman Conservancy Association reviewed and provided detailed comments on this Management Plan at various stages of its development, and led the community consultation process. An online questionnaire was also made available from August – November, 2019 and was completed by 9 people.

5.4 Engagement Results

A Public Open House presenting the first draft of this Inner Island Management Plan revision was held at the Marcus Isbister Old School Centre, 5901 Denman Road, on Saturday, September 7th from 11-1pm. 49 people attended this Open House and many participants provided verbal feedback to DCA and ITC personnel about the management plan draft there presented. A computer was made available at the Open House for anyone wishing to fill out the online questionnaire. Refreshments were provided to attendees.

In addition to the Open House, DCA solicited further input from neighbours and others interested in the Reserve through an article in the DCA Newsletter and at our Annual General Meeting in February 2019. Interested parties were invited to contact DCA in order to obtain a copy of the draft plan for review, and answer the online questionnaire. DCA hosted a link to the ITC questionnaire on the Conservancy website, and shared a link to it on social media. The draft management plan was made available for review to three interested neighbours and community members whose written comments were submitted via email to the DCA Land Manager, and then compiled and sent to ITC staff for incorporation into the plan.

Community members were also invited to join DCA Lands Committee members on a site visit to Inner Island Nature Reserve to discuss management issues on the ground. DCA posted a full-page advertisement in the local Grapevine publication, and placed posters around the 'downtown' area. The site visit at Inner Island Nature Reserve on the afternoon of November 23, 2019 attracted 15 community members. Prior to this site visit, 18 people attended a slideshow presentation by Jenny Balke featuring maps and images from the draft management plan.

Questionnaire responses submitted by 9 residents of Denman (8 full-time and 1 part-time) provided useful information about Inner Island Nature Reserve, including ecological observations and historical information. The responses revealed that hiking/walking, wildlife viewing, and dog walking are common uses of IINR. The values chosen as most important for IINR by survey respondents were: Ecosystem Services; Conservation for the sake of the intrinsic value of nature; and Protection of habitat for species at risk. Other values selected by respondents included: Recreational

opportunities; Education/research opportunities; Aesthetic appeal. The responses generally validated the objectives outlined in the current management plan.

Respondents cited a number of activities that they feel are Incompatible with the natural features of this Nature Reserve. These included: Making more trails; encouraging increased human activity; road widening; motorized vehicles; (mountain) biking; tree cutting; dogs off leash; hunting; smoking; plant collecting; anything that challenges the integrity of the environment other than trails for walking; any resource extraction with exception of First Nations use. Respondents also described what they believe are the greatest threats to the Reserve: climate instability; encroaching development; invasive species; unauthorised camping; fire hazards; rogue tree cutting; roads and dust; and too much access.

Overall, public outreach and engagement about IINR and this management plan revealed that while they enjoy and value the Nature Reserve and its intrinsic natural diversity and amenities, islanders are also concerned about the impacts that encroachment on the natural values of the land from too much—or unauthorized—access of various types can cause on the Nature Reserve. In particular, off-leash dogs, increased trail development, tree cutting and fire risk were concerns mentioned by multiple respondents. It will be important going forward for DCA and ITC to solicit feedback about the ongoing use of the Reserve from community members.

6 Management Plan Recommendations

Inner Island Nature Reserve is a dynamic, well-developed, beaver-dependent wetland complex surrounded by mature and young Douglas-fir forests. Young forests in the Reserve have been recovering naturally, without intervention, since logging activity ceased in 1984 in north portion of the Reserve, and in the south portion since construction of the logging road ceased in 1990. The forest's canopy is now beginning to open, the climax forest species are establishing, and the understory is developing. Overall, the ecological communities of the Reserve appear to be in good condition and support active, diverse wildlife populations.

The management of the Reserve has followed the objectives stated in the early Inner Island Management Plan, namely, "to minimize interference with natural biological and hydrological processes; to minimize negative effects from surrounding land uses on the pond, marshes and adjacent forested areas; and to minimize the effects of human activities within the Inner Island Nature Reserve" (Denman Conservancy Association 2005). Thus, management initiatives have focused on monitoring, basic trail maintenance, responding to trespass incidents, and community education. An issue that has always received immediate intervention for both public safety and wildfire protection has been the management of dead trees falling across the trail. The recommendation is to cut young trees hanging up in the forest near the trail or roads to allow them to contact the moist forest floor, thereby speeding their decay and reducing

the fire risk. Illegal tree harvesting along the roads at the edges of the Reserve has been an issue in the past, requiring reporting and public education. Trespass concerns are still warranted, as evidenced by the cannabis-growing operation discovered next to the marsh in 2018.

Management recommendations for the Reserve range from increased, focused monitoring to envisioning altered ecosystems in response to climate change. A key recommendation is to establish a volunteer warden to assist with reserve management and help with the development and assessment of a routine monitoring program. In addition to a monitoring program, valuable ecological data about the features and changes within the Reserve could be gained by creating a system for accepting inventory data from visiting naturalists. The addition of an information kiosk could improve the community's awareness of the Reserve's ecology and about fire protection and prevention. Assistance and advice from the Denman Island Volunteer Fire Department is recommended to mitigate and prepare for wildfire. Also recommended is an overall invasive species strategy for along the trails, with an emphasis on English holly. Last, approaches for dealing with climate change could include examining ecosystem composition (species, conditions and growing sites) in protected areas in southwestern BC and the northern USA, predicting and observing the adaptations of local species to new climatic conditions, and focusing management on learning and adapting new strategies to deal with the new situations.

6.1 Management Roles

The Reserve is held by the Islands Trust Conservancy and is monitored annually by ITC, or its contractors, to determine any management concerns. Denman Conservancy Association (DCA) will help identify major management issues and carry out most of the management actions within the Reserve, in accordance with the management plan, through annually renewed service contracts with the landholder, Islands Trust Conservancy (Table 8). Annual monitoring to ensure compliance with terms of the conservation covenant are the responsibility of the covenant holder, Nature Conservancy of Canada.

Table 8. Inner Island Nature Reserve Management Partners

Partner	**Role**
Islands Trust Conservancy	Land Holder
Denman Conservancy Association	Management Partner
Nature Conservancy of Canada	Covenant Holder

6.2. Permitted and Prohibited Uses

The Nature Reserve is open to the public for walking and nature appreciation. Any uses that could reasonably pose a threat to vegetation, wildlife or wildlife habitat are not permitted. Visitors are expected to keep their pets on leash and under control while in the Reserve.

In accordance with the covenant agreement:

- No component of the land, including soil, gravel, or rock, may be disturbed, explored for minerals, moved, or removed from the land;
- No living or dead tree, including bushes, shrubs, or other plant life, may be trimmed, pruned, cut down, damaged, destroyed, moved, harvested, or removed from the Reserve;
- No herbicides, insecticides, or pesticides may be applied or introduced on the land;
- There may be no alteration or interference with the hydrology of the land without the written approval of the covenant holder;
- The land must not be polluted or contaminated by any matter;
- There may be no interference with, or alteration of, any wetland or body of water in the Reserve;
- No fixtures or improvements, including buildings or other structures, may be built, affixed, or placed on the land;
- No road or trail, other than the existing road, may be laid out or constructed in the Reserve, without the written approval of the covenant holder;
- No fill, soil, rock, rubbish, ashes, garbage, waste, or other material foreign to the land may be deposited in or on the land;
- No hunting, fishing, commercial gathering, or grazing of domesticated animals may be carried out in the Reserve; and
- No other acts may be carried out in the Reserve that, in the opinion of the covenant holder, may have a detrimental impact on the land.

In addition, the following activities are also prohibited in the Reserve:

- Use of motorized vehicles
- Bicycling
- Horseback riding
- Camping
- Fires
- Hunting
- Smoking
- Trail development
- Tree cutting
- Collection or harm of plants, fungi or animals

6.3 Proposed Monitoring Program

ITC monitors annually looking for management concerns. The Nature Conservancy of Canada conducts annual compliance monitoring as covenant holder of the Reserve. DCA regularly visits the Reserve working as the local management partner. Further possible initiatives to augment the monitoring program for the Reserve are as follows:

1. Seek out and appoint a volunteer warden to report regularly (e.g., monthly) and form a ‘friends of’, if there is interest.

2. Invite the warden and any other interested volunteers to undertake specific monitoring tasks and participate in annual monitoring visits with all partners to discuss monitoring findings and management issues.
3. Establish specific photopoint stations to document important features that may change over time or need monitoring for protection.
4. Establish water quality monitoring sites in a) Pickles Marsh at the mouth of East Creek, and b) in the lowest reach of Kennedy Creek.

Possible monitoring tasks for ecological or other features could include:

1. Taking photos at all photopoint stations on an arranged schedule and assessing the changes.
2. Collecting water samples and conducting the water quality tests at the water monitoring sites.
3. Walking the trail to check on the condition, use, and any problems such as garbage dumping, invasive species' presence, fallen trees, etc..
4. Assisting the work bee program to conduct an annual assessment of the presence or spread of non-native invasive species, such as English holly.
5. Conducting specific counts or measurements of chosen species or species groups (e.g., resident birds throughout the year, neotropical migrant birds in summer, the growth of specific plants, monitoring evidence of beaver activity).

6.4 Public Access

The trail through the Reserve is available to the public and links into a trail network within DCA's Central Park and the Denman Provincial Park and Protected Area. Alternative access opportunities for First Nations may be established through a separate Management Plan for *Areas of Cultural Heritage and Sacred Significance*.

6.5 Signage

Signage is kept to a minimum in the Reserve (Figure 5). Recently, DCA installed a sign at the edge of Pickles Road adjacent to the south portion of the Reserve that makes drivers aware that they are passing through conservation land (Photo 6). Other identification signs (Photo7) include a small sign at the entrance to the Reserve trail off Pickles Road (Photo 7a), which provides basic information about the Reserve, and a sign on the trail at the southern boundary of the north portion. Additional 'No hunting' and 'No tree cutting' signs are located on the boundaries of the Reserve (Photo 8). As the trail through the Reserve is short and clear, trail markers are not essential, but would be beneficial. Boundary marker posts would also be beneficial for locating survey pins and for easy reference of the boundary lines.

Installation of an information/education kiosk at the trailhead of the Reserve, similar to other installations at protected areas on Denman, would help visitors appreciate the location and value of the Reserve. The importance of beavers to the marsh, the need to keep dogs on leash and under control, the hazards of fire, and a trail map could be

included in the messaging. The kiosk, as well as active monitoring, might help to discourage trespass activity.

6.6 Trail Use, Maintenance and Development

The Reserve trail is in good shape. Little maintenance is required, except for some exposed roots that may require covering to prevent tripping, and to remove seral western hemlock (*Tsuga heterophylla*) trees that may fall and hang over or block the trail. As noted earlier, trail markers and a kiosk with maps would be beneficial additions.

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

The Reserve benefits from a large amount of surrounding protected land, as well as adjacent wetland complexes. With limited public access and the extensive available habitat, most of the rare species confirmed or possible within the Reserve are relatively safe from human disturbance. The persistence of northern red-legged frogs is dependent not only on the integrity of the marsh and wetlands, but also on the absence of bullfrogs in the habitat. Unfortunately, the identification and removal of Denman's first confirmed bullfrog was recorded a few kilometers north of the Reserve in 2018 and monitoring of the Pickles Marsh area for bullfrogs could be undertaken. While no large Great Blue Herons rookeries were known in the Reserve, the Reserve provides both foraging and sheltering habitat for herons. The future of Great Blue Herons on Denman is uncertain as Bald Eagles and ravens continue to exert high predation pressure on their once-productive heronries. These predators target heron chicks as prey, and few, if any, immature herons are seen. As a result, the species' long-term future in this area is bleak.

Protection of the rare ecological forest communities is relatively assured by the large protected area that surrounds the Reserve and acts as a buffer against human influence. The major problem facing these ecological communities will be the increasing temperatures and moisture deficits that are expected with the changing climate. Added protection for the marsh and wetland communities from water pollution or inflow issues could be gained by securing further protected lands along the inflowing waterways, particularly along an extensive marsh system to the west of Pickles Marsh and along Kennedy Creek.

While not an 'at risk' species, beaver are critical to protecting the marsh and wetland habitat that supports the aquatic species at risk. Thus, increased outreach to the community about the importance of beaver and their vulnerability to disturbance will continue to be important.

6.8 Ecological Restoration Options

The damaged forest community has been naturally regenerating well and restoration initiatives are not considered necessary at this time. Invasive species removal will continue. Mitigation activities may be possible through the lifetime of this plan to decrease deer overbrowsing and allow for understory and tree vegetation to regenerate and recapture lost biodiversity elements and structure.

6.9 Scientific Research/Education Opportunities

A bat acoustic call logger collected data about bat species using Beaver Pond in August 2019. Analysis of the calls will take place as part of the immediate actions of this plan and will give an indication of the species diversity. Subsequent acoustic inventories can be made at other times in future years.

Additional inventory and behavioural studies, particularly of species at risk but also of species strongly linked to the Reserve's ecological processes, such as beaver, could increase the overall understanding of the Reserve's ecology. Such studies need to be undertaken in a manner that does not disrupt the important habitats within the Reserve. For example, wandering salamanders (*Aneides vagrans*) are undoubtedly present in the Reserve, but incidental observations are highly unlikely. The most effective inventory method would involve using drift fences with pitfall traps and/or taking apart decaying coarse woody debris. However, the costs of disturbance and damage to habitat of such an inventory would need to be weighed against the value of the knowledge to be gained. Alternatively, it may be sufficient to search for these salamanders by gently lifting coarse woody debris in some locations, without doing damage, or by adding artificial cover objects, such as wooden boards, throughout potential habitat to be checked as part of a long-term study. In the same way, when using call playback surveys for rare Western Screech Owls (*Otus kennicottii ssp kennicottii*), the researcher needs to be aware of the possibility of attracting predatory Barred Owls (*Strix varia*).

On July 16, 2019 the ITC Board adopted a Reconciliation Declaration[6] that states a commitment to creating opportunities for knowledge-sharing, understanding, and collaboration. Relationship-building with regional First Nations could lead to an improved understanding of important cultural and ecological knowledge about the forests and wetlands of Denman and possibly about historical uses and cultural values of the Reserve itself. The first steps in relationship-building may include inviting discussion and story-telling, offering support to visiting elders, and helping with any matters identified by First Nations.

6.10 Exotic and Invasive Species Management

Removal of all English holly and Scotch broom within the Reserve is possible with a comprehensive program, as the number of plants is relatively low. Manual removal methods similar to those used by the DCA in other protected areas on Denman could be employed. The majority of the holly plants are in the south portion of the Reserve, although a few are present in the north portion (Figure 5). Broom was observed only on an old logging access in the northeast corner of the Reserve, adjacent to Central Road. The presence of reed canary grass in the wetlands is more problematic. Removal in the

[6] http://www.islandstrustconservancy.ca/media/84933/itc_2019-09-05_itc-reconciliation-declaration-picture.pdf

open, exposed wet areas would require large digging equipment that would do damage to the Reserve. A possible method to limit some of the spread would be to manually cut back the stalks once or twice a year, where possible. However, even this approach would cause compaction of the wet soils and some degree of habitat disruption. Nevertheless, it could be tried and its effectiveness assessed through monitoring. A variety of other mildly invasive species are present and an overall yearly assessment of these species could be a task for the volunteer warden.

6.11 Wildfire Risk Management

Wildfire risk management actions, such as removing woody debris, are limited by the overarching conservation objective of minimizing disturbance to the natural environment. The response to a major wildfire could be challenged by the lack of road access to much of the reserve. As the Reserve is fairly small, some fires could be fought from the edge, but a major fire would likely require provincial assistance with water bombers. Wildfire mitigation and response plans should be developed in collaboration with Nature Conservancy of Canada, DCA and the Denman Island Volunteer Fire Department. These should be updated annually as needed. Methods of controlling human sources of fire include posting notices of smoking bans, installing signs to notify the public of the fire-danger index, adopting a cigarette butt disposal protocol, and closing the trail during periods of extreme danger.

In the north portion of the Reserve, including along the trail, the amount of standing dead and fallen trees is increasing as the western hemlocks die off. This increase in fuel creates a fire hazard. Fortunately, the area is very wet overall, and wildfire risk can be reduced by dropping leaning and perhaps a portion of the young standing dead trees to the ground to enhance their moisture content and encourage coverage by moss (Photo 23b).

6.12 Climate Change Impacts and Management

The moist, flat areas of the Reserve are likely to be the least affected in the short term by the loss of trees and other forest changes, compared to drier sites or those with more exposure. Although unusual storm events may have windthrow impacts on very tall trees in exposed areas, most of the Reserve is fairly protected, in a valley or on flat bottomland. The areas most likely to be impacted by wind disturbance include the forest on the southeast corner of the south portion of the Reserve and the exposed shore of the marsh in the south portion, which includes tall old-growth Douglas-firs. Both areas have withstood the recent unusual windstorm events.

The effect of warmer, drier conditions on the wetlands warrants monitoring. Changes in the species composition of the wetlands and reduction of the wetland area are predicted. More elevated dry sites may develop if water levels drop slightly, as this area is very flat. This change may encourage tree growth and shading of the understory in the previously open areas, leading to increased swamp forest development.

Climate changes may also affect the timing of seasonal events, which would likely disrupt the current patterns of emergence and migration of many species. Wetland communities involve a variety of species with life cycles dependent on water levels and linked to air and water temperatures. Because many of the cycles linking these species are not well-understood, climate change impacts are unknown.

The increased risk of wildfire is perhaps the greatest management challenge for the Reserve. Another concern is the potential increase in abundance and diversity of non-native species, including damaging insect pests that are better able to establish in already climate-stressed ecosystems. In general, for the small discrete protected land parcels on the Gulf Islands, these impacts may change the very features that contributed to their initial protection.

Managing for climate change is likely to mean preparing for new ecological scenarios that involve increased temperatures and reduced moisture conditions. Not only do managers need to plan for the protection of the existing ecosystems in the Reserve, but they also need to design realistic plans to adapt to the various scenarios that may develop over time. The natural values originally present may change considerably, and new values and opportunities may arise. Knowledge of the species growing in protected areas on the Southern Gulf Islands could be beneficial in appreciating expected ecosystem changes, as Denman's climate warms to that of islands to the south. In this potentially unstable future, adaptive management may be the best approach. This includes 1) observing how the natural systems seem to cope with the changes, 2) monitoring various changing features, and 3) managing 'gently,' while limiting human impacts to prevent further stress to the Reserve's ecosystems.

7 Action Items

The following action items are tasks that are intended to contribute to the management, maintenance, or protection of the natural and cultural values of the Reserve and that can be completed by the team of management partners.

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. Seek out and appoint a volunteer warden and invite other volunteers to join a 'friends of' group if there is interest. Decide on the monitoring tasks for the warden and other volunteers.
3. Plan an overall strategy for the removal of invasive species.
    a) Plan and begin the removal of English holly.
    b) Remove the Scotch broom from the logging road.
    c) Develop a plan to control the spread of reed canary grass.

4. Remove illegally dumped materials and other evidence of trespass, including removal of the materials from the recently-discovered cannabis growing operation (plastic bags, soil, etc.) This should be done in the late fall to minimize minimal disturbance of breeding birds.
5. Engage with First Nations to ensure that the management plan is reflective of treaty, inherent rights, and the traditional territories of each Nation.
6. Work in collaboration towards a Management Plan for Areas of Cultural Heritage, gathering and harvesting, and Sacred Significance with First Nations.
7. Analyze the bat calls that have been collected with the bat acoustic call logger collected as part of the ecological inventory for this Management Plan to give an indication of the species diversity. Plan for subsequent acoustic inventories in future years if resources allow.
8. Consider the need for a kiosk. Design and secure funding for a kiosk if desired. Successful design models include the Cultural Journey kiosks on the Sea to Sky Highway.
9. Consider the need for trail markers.
10. Conduct a fire risk analysis for the Nature Reserve. Meet with the Denman Island Volunteer Fire Department to discuss approaches for mitigating the threat of wildfire in the Reserve, particularly human-source fires.

7.2 Short term Actions (3–5 years)

1. As resources allow, continue with invasive species management by implementing a comprehensive invasive species strategy (inventory, removal, reassessment), particularly for English holly.
2. As resources allow, conduct species at risk surveys at appropriate times of year to document species of concern, collect baseline data, guide future management and restoration efforts, and to provide a better understanding of the natural values of the reserve.
3. Begin the discussion of anticipated climate change. As resources allow, design effective monitoring tasks to collect basic data on possible ecosystem changes (e.g. through brainstorming with other reserve managers). Work and liaise with First Nations associations on climate strategies and knowledge.
4. If supported, construct and install an information kiosk.

Long term Actions (5+ years)

1. Review the effectiveness of invasive species management strategies and adapt as needed.
2. Review the effectiveness of climate change monitoring programs and adapt as necessary.
3. Maintain and update plant species inventories for the Reserve as funding allows.
4. Consider preparing an educational pamphlet about the significant Reserve species if funds allow.

7.4 Ongoing or Annual Action Items

1. Annual monitoring walk and discussion between ITC, management and covenant partners, volunteer warden and First Nations.
2. Annual review of issues identified by the volunteer warden, Nature Conservancy of Canada and DCA (e.g., invasive species management, trail and incursion impacts, etc.).
3. Annual review of the wildfire risk, ideally every April to prepare for wildfire season.
4. Annual review of possible climate-related changes and adaptations occurring within the Reserve, as required.

8 Conclusions

The 9.4 hectares comprising Inner Island Nature Reserve are at the heart of a major beaver-created wetland complex and part of 640 hectares of contiguous protected land on north-central Denman Island. The three creeks, associated wetlands, and a marsh support high biodiversity. Both the young and maturing (approx. 100 years old) Douglas-fir forests provide a buffer for the wetlands and add to the area of continuous intact forest. The Reserve protects three rare ecological communities and three rare species, with an additional 14 rare species likely or possible within the Reserve.

The major management issues relate to protecting the integrity of the marsh, wetlands, and forests from prohibited human activities, both intentional and accidental, and ensuring public safety and mitigating wildfire risk along the trail and adjacent roads in this relatively remote area. The key recommendation is to appoint a volunteer warden to assist ITC and DCA with routine monitoring and maintenance tasks. Other management recommendations include developing both an invasive species management plan and a climate change response plan that involve focused monitoring for data collection, with ongoing analysis of the data and adaptive decision-making based on observations.

Inner Island Nature Reserve is a complex of ecosystems with high biological diversity, its species composition and web of interconnections is not yet fully understood. The long-term protection of the Reserve's ecological integrity will depend on a delicate application of management practices designed to protect the complex network of organisms and ecological processes against threats ranging from the readily apparent and straightforward to the unseen and unknown.

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10 Appendices

Appendix 1. Photographic Documentation

Major photo locations are shown on Figure A1-1, and all photos are described in Table A1-1.

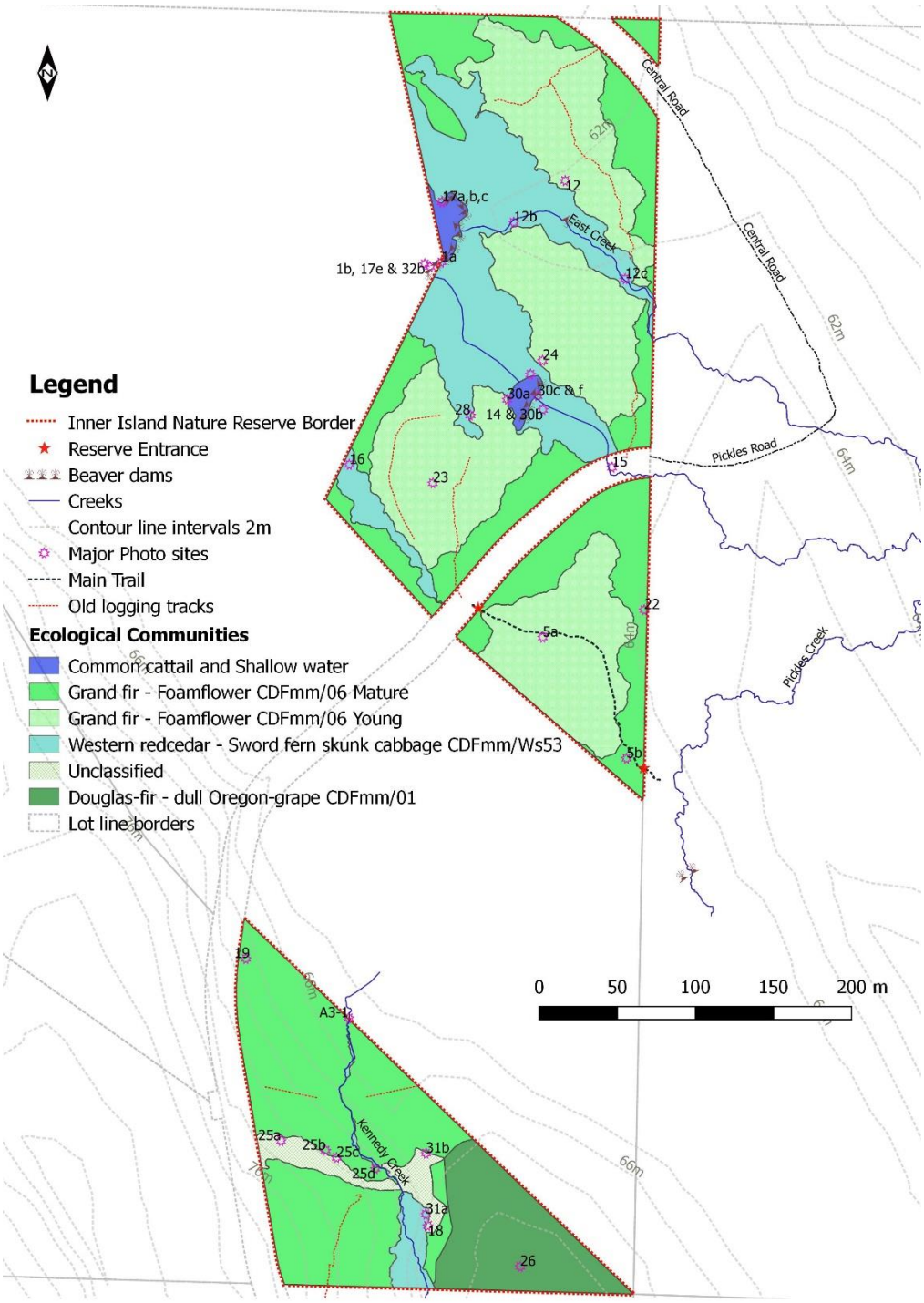


Figure A1- 1. Major photo site locations in Inner Island Nature Reserve.

Table A1- 1. Documentation of photographs taken by J. Balke and used in this Management Plan

Text Section	Photo	Location UTM Zone 10 Coordinates	Direction (°)	Date YYYY-MM-DD	Description
1	1a	369703 5489926	20	2019-03-16	Beaver dam at mouth of East and Beaver Pond creeks Polygon 4
1	1b	369671 5489900	65	2019-09-14	Beaver dam as above
2.1	2	369700 5489674	120	2019-06-09	Trail entrance
2.5	3	369675 5489691	55	2019-07-27	Springboard stumps
2.5	4	374042 5486000	295	2019-06-09	Possible historic railway-logging mounds
2.6	5a	369746 5489661	105	2019-07-27	Trail
2.6	5b	369800 5489584	325	2019-07-27	Trail
2.6	6	369573 5489255	350	2019-07-27	Conservation Area sign on Pickles Road
2.6	7a	369707 5489672	80	2019-07-27	Entrance sign at Pickles Road
2.6	7b	369806 5489578	310	2019-07-27	Entrance sign at southern boundary the north portion
2.6	8	Various, see photo collage		2019-07-27	Signage
2.6	9	369669 5489287	205	2019-05-12	Former well hole
2.10	10	369747 5489237	45	2019-07-27	Deer trail in the south portion
2.10	11	369678 5489947	195	2019-03-16	Cannabis cultivation in Pickles Marsh
3.4	12a	369761 5489954	120	2019-05-17	East Creek wetland, Polygon 4
3.4	12b	369674 5489899	180	2019-09-14	East Creek channel Polygon 4
3.4	12c	369674 5489899	335	2019-09-14	East Creek south edge of young forest Polygon 4
3.4	12d	369791 5489903	140	2019-05-17	East Creek edge of mature forest Polygon 4
3.4	13a	369701 5489836	130	2019-06-09	Beaver Pond Creek wetland before pond Polygon 4
3.4	13b	369746 5489807	100	2019-04-25	Beaver Pond Creek wetland after pond Polygon 4
3.4	13c	369700 5489804	320	2019-06-09	Beaver Pond Creek wetland - Reed canary grass area Polygon 4
3.4	14a	369724 5489813	190	2019-03-16	Polygon 5b Beaver pond
3.4	14b	379747 5489806	310	2019-04-25	Polygon 5b Beaver pond
3.4	14c	369743 5489816	310	2019-05-17	Polygon 5b Beaver pond

3.4	14d	369735 5489821	180	2019-06-09	Polygon 5b Beaver pond
3.4	14e	369735 5489821	180	2019-06-27	Polygon 5b Beaver pond
3.4	15	369791 5489770	90	2019-05-17	Beaver Pond Creek Pickles road-side pond
3.4	16	369622 5489772	140	2019-05-17	Third Creek Polygon 4
3.4	17	369673 5489285	290	2019-05-12	Kennedy Creek wetland Polygon 4
3.4	18a	369671 5489900	20	2019-05-17	Polygon 5a Pickles Marsh
3.4	18b	369676 5489940	200	2019-06-09	Polygon 5a Pickles Marsh
3.4	18c	369676 5489940	200	2019-09-14	Polygon 5a Pickles Marsh
3.4	18d	369673 5489897	335	2019-09-09	Polygon 5a Pickles Marsh
3.6	19a	369556 5489456	140	2019-05-12	Polygon 1 Mature lowland forest in south portion
3.6	19b	369688 5489374	175	2019-09-09	Polygon 1 Mature lowland forest in south portion
3.6	20	369581 5489429	310	2019-07-27	Veteran Douglas-fir in south portion Polygon 1
3.6	21	369567 5489425	145	2019-07-27	Standing snag in south portion Polygon 1
3.6	22	369760 5489249	170	2019-05-12	Polygon 1 Mature lowland forest in north portion
3.6	23	369676 5489760	350	2019-05-10	Polygon 2 Young lowland forest
3.6	24	369746 5489839	30	2019-07-27	Polygon 2 Young lowland forest
3.6	25a	369579 5489339	285	2019-07-27	Polygon 6 Logging road clearing
3.6	25b	369607 5489333	280	2019-07-27	Polygon 6 Logging road clearing
3.6	25c	369614 5489328	290	2019-06-09	Polygon 6 Logging road clearing
3.6	25d	369639 5489321	285	2019-07-27	Polygon 6 Logging road clearing
3.6	26	369732 5489258	130	2019-05-12	Polygon 3 Dry forest.
3.6	27a	369676 5489940		2019-06-09	Yellow pond lily in Pickles Marsh
3.6	27b	369676 5489940		2019-06-09	Common pondweed in Pickles Marsh
3.6	28a	369671 5489292	180	2019-06-09	Polygon 7 Creek-side bench
3.6	28b	369672 5489331	205	2019-09-09	Polygon 7 Creek-side bench
3.8	29a	Pickles Marsh		2017-04-20	Beaver in Pickles Marsh
3.8	29b	369671 5489900		20219-09-14	Beaver print
3.9	30	369799 5489768	35	2019-06-09	Dying western hemlocks in Polygon 2
App 2	A2-1	On main beaver dam		2019-03-16	Rough-skinned newt (*Taricha granulosa*)

App 2	A2-2	369799 5489841		2019-05-17	Northern red-legged frog (*Rana aurora*)
App 2	A2-3	Various		Various	Invertebrates
App 2	A2-4	369824 5489675		2019-05-12	Red squirrel (*Tamiascurius hudsonicus*) midden
App 3	A3-1	369617 5489425	360	2019-07-27	Kennedy Creek edge wetland

Appendix 2. Species Status Rank Explanations

* **Provincial Status** applies to a species' or ecological community's conservation status in British Columbia. The number in parenthesis is the year the status rank was last reviewed. **1** = critically imperiled, **2** = imperiled, **3** = special concern, vulnerable to extirpation or extinction, and **4** = apparently secure.
** **B.C. List Status**: Species are assigned to provincial lists depending on their Provincial Conservation Status. **Red:** Includes any native species or subspecies that have, or are candidates for, Extirpated, Endangered, or Threatened status in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation. **Blue**: Includes any native species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered, or Threatened.
^ **Global Rank** applies to a species/ecological community across its entire range. The number in parenthesis is the year the rank was last reviewed. 1 = critically imperilled, 2 = imperilled, 3 = vulnerable to extirpation or extinction, 4 = apparently secure, 5 = demonstrably widespread, abundant, and secure, and NR = not yet assessed.
^^ **COSEWIC** (Committee On the Status of Endangered Species In Canada) rank is followed by the date that the rank was last reviewed. **E = ENDANGERED**: A species facing imminent extirpation or extinction. **T = THREATENED**: A species that is likely to become endangered if limiting factors are not reversed. **SC = SPECIAL CONCERN**: A species of special concern because of characteristics that make it is particularly sensitive to human activities or natural events.
˜ **SARA** (Species At Risk Act) status consists of the SARA Schedule followed by the SARA Status code and may be followed by the date that the rank was last reviewed. **E = ENDANGERED**: A species facing imminent extirpation or extinction. **T = THREATENED**: A species that is likely to become endangered if limiting factors are not reversed. **SC = SPECIAL CONCERN**: A species of special concern because of characteristics that make it is particularly sensitive to human activities or natural events.

Appendix 3. Wildlife Species

Wildlife species that were identified in the Reserve are listed in Table 3, and rare species are noted in Table 5. Beaver are responsible for raising water levels and thus forming the marsh and the complex surrounding aquatic environment. A beaver was seen foraging among the common cattail (*Typha latifolia*) roots in June 2016 at the north end of Pickles Marsh. A rough-skinned newt (*Taricha granulosa*) was seen on the beaver dam in March 2019 (Photo A3-1), and northern red-legged frogs (*Rana aurora*) were seen near the creeks and in the adjacent forest (Photo A3-2). A variety of invertebrates were seen in the wetlands, some of which are shown in a photo collage (Photo A3-3). Red squirrels (*Tamiasciurus hudsonicus*) and their middens (Photo A3-4) were seen throughout the Reserve.

Photo A3- 1. Rough-skinned newt on beaver dam.

Photo A3- 2. Northern red-legged frog.

Additional Potential Rare Species

An additional 11 rare species may be found in the Reserve (Table A3-1), as these species have either been seen there previously or have been identified in similar habitats nearby.

Photo A3- 3. Various invertebrates seen in Inner Island Nature Reserve.

Photo A3- 4. Red squirrel midden.

Table A3- 1. Rare species potentially using habitats possible in Inner Island Nature Reserve but not identified in this inventory

Species Name		Status					~IINR
Common	**Scientific**	**Provincial***	**BC List****	**Global^**	**COSEWIC^^**	**SARA~**	
Autumn meadowhawk dragonfly	*Sympetrum vicinum*	S3S4 (2015)	Blue	G5 (2015)			L*
Barn Swallow	*Hirundo rustica*	S3S4B (2015)	Blue	G5 (2016)	T* (2011)	1-T (2017)	L
Band-tailed Pigeon	*Columba fasciata*	S3S4 (2015)	Blue	G4 (2016)	SC (2008)	1-SC (2011)	L
Common woodnymph butterfly, incana subspecies	*Cercyonis pegala incana*	S2 (2013)	Red	G5T4T5 (2003)			L
Dun skipper butterfly	*Euphyes vestris*	S2 (2013)	Red	G5 (2016)	T (2013)	1-T (2003)	L
Little brown myotis (bat)	*Myotis lucifugus*	S4 (2015)	Y∞	G3 (2016)	E (2013)	1-E (2014)	S*
Marbled Murrelet	*Bradchyramphus marmoratus*	S3B,S3N (2015)	Blue	G3 (2016)	T (2012)	1-T (2003)	P
Northern Goshawk,	*Accipter gentilis laingi*	S2 (2010)	Red	G5T2 (2016)	T (2013)	1-T (2003)	P

laingi subspecies							
Oregon forestsnail	*Allogona townsendii*	S2 (2015)	Red	G3G4 (2010)	E (2013)	1-E (2005)	L
Peregrine Falcon, *pealei* subspecies	*Falco peregrinius pealei*	S3 (2010)	Blue	G4T3 (2016)	SC (2017)	1-SC (2003)	P
Townsend's big-eared bat	*Corhyorhinus townsendii*	S3S4 (2015)	Blue	G4 (2016)			L
Wandering salamander	*Aneides vagrans*	S3 (2016)	Blue	G4 (2005)	SC (2014)	1-SC (2010)	L
Western pine elfin butterfly *sheltonensis* subspecies	*Callohyrs eryphon sheltonensis*	S3 (2013)	Blue	G5TNR			L
Western Screech Owl	*Megacops kennicottii*	S2S3 (2017)	Blue	G4G5T4 (2016)	T (2012)	1-T	L

∞ Y = yellow

*S=recorded in the Reserve previously, L=likely, P=possible

Species Status Ranking Explanations

*** Provincial Status** applies to a species' or ecological community's conservation status in British Columbia. The number in parenthesis is the year the status rank was last reviewed. **1** = critically imperiled, **2** = imperiled, **3** = special concern, vulnerable to extirpation or extinction, and **4** = apparently secure.
**** B.C. List Status**: Species are assigned to provincial lists depending on their Provincial Conservation Status. **Red:** Includes any native species or subspecies that have, or are candidates for, Extirpated, Endangered, or Threatened status in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation. **Blue**: Includes any native species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened. **Yellow**: Includes species that are apparently secure and not at risk of extinction. Yellow-listed species may have red- or blue-listed subspecies.
^ Global Rank applies to a species/ecological community across its entire range. The number in parenthesis is the year the rank was last reviewed. 1 = critically imperilled, 2 = imperilled, 3 = vulnerable to extirpation or extinction, 4 = apparently secure, 5 = demonstrably widespread, abundant, and secure, NR = not yet assessed.
^^ COSEWIC (Committee On the Status of Endangered Species In Canada) rank is followed by the date that the rank was last reviewed: **E = ENDANGERED**: A species facing imminent extirpation or extinction. **T = THREATENED**: A species that is likely to become endangered if limiting factors are not reversed. **SC = SPECIAL CONCERN**: A species of special concern because of characteristics that make it is particularly sensitive to human activities or natural events.

˜ **SARA** (Species At Risk Act) status consists of the SARA Schedule followed by the SARA Status code and may be followed by the date that the rank was last reviewed: **E = ENDANGERED**: A species facing imminent extirpation or extinction. **T = THREATENED**: A species that is likely to become endangered if limiting factors are not reversed. **SC = SPECIAL CONCERN**: A species of special concern because of characteristics that make it is particularly sensitive to human activities or natural events.

Appendix 4. Ecological Community Polygon Description

Seven ecological communities are described in the following charts. Forest communities include both maturing climax and maturing seral grand fir / three-leaved foamflower (*Abies grandis / Tiarella trifoliata*) and maturing climax Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii / Berberis nervosa*). The principle wetland community occurring along the four creeks is western redcedar / swordfern – skunk cabbage (T*huja plicata / Polystichum munitum – Lysichiton americanus*). There are two open water communities: the beaver pond on Beaver Pond Creek and Pickles Marsh. In addition, two communities are recovering and are unclassified: a slowly recovering area that was cleared as a logging road in 1990 and a small creek-side bench, approximately 0.1 and 0.06 hectares respectively. Both may have been sites of historic as well as more recent human activities, and soils may, as a result, be compacted and thus slow to redevelop into the original climax forest. Preliminary future classification of these communities is listed in square brackets. The vegetation within these communities is described.

Polygons

1. Grand fir / three-leaved foamflower (*Abies grandis / Tiarella trifoliata*) mature lowland forest community

Table A3.1.1. Ecological community 1. Mature lowland forest. Description.

Polygon Site	1 Mature Forest
Ecological Community	Western redcedar - Grand fir - Foamflower
Classification	CDFmm 06
Structural Stage	Mature forest
Status (BC List)	Red
Slope (%) and Aspect (°)	North portion: fairly flat with hummocks. South portion: west of the creek Avg. 16% 65°; east of the creek is a rolling hummocky section.
Photographs	19, 20, 21, 22
Ecological Community Description	Older mature second growth forest is mainly Douglas-fir and western redcedar with some grand fir and western hemlock. The shrub layer is very open, and the herb layer is mainly vanilla leaf and sword fern. Step moss is the most abundant moss in many areas, but there are many moss species, mostly on trees and downed wood. Old veteran fir snags and springboard stumps are present. Species composition and percent cover varies across the polygon.

Disturbance Notes	The polygon's forest is on the two parts of the property and both sides of the Pickles Creek in the south portion. The forest is a fringe around the sections of the north portion that were logged in 1984, the most intact portion on the southeast. The south portion is intact except for a narrow logging road incursion in 1990 (Polygon 6). Many of the old stumps throughout the polygon have burn scars from long-ago fires. Old skid roads from the logging in the north portion are now just barely visible as stump-less routes through the canopy. In the south portion, nearly hidden by fallen trees and vegetation, the remains of parallel mounds used in the railway/steam donkey logging in the early 1900s run from near Pickles Marsh across the creek and up the bank to Pickles Rd.
Anticipated Change/ Succession	This maturing forest has supplied genetic resources for growth in the adjacent logged areas and will continue to do so as the seral stage in the logged area matures and is replaced by the climax forest. Climate-change-related heating and drying may affect the redcedars, particularly on slopes, but this effect will be mediated by the adjacent wetlands and creeks. If deer-browsing increases seedling mortality would also increase.
Wildlife Observations	The older trees with large limbs and thick bark, as well as the large snags and stumps, benefit large perching birds, bark foraging species and cavity nesters . The large canopies provide abundant seed production, insects, and shelter for birds and red squirrels (*Tamiasciurus hudsonicus*). The large pieces of CWD benefit the forest floor dwellers, the decomposers, and the moisture dependent amphibians.

Table A3.1.2. Ecological community 1. Mature lowland forest. Vegetation cover by layer.

Polygon 1 Mature lowland forest Vegetation Cover	**Percent Cover (%)**								
	Veteran Tree Canopy	**Main Canopy**	**2ndary Canopy**	**Total Canopy Cover**	**Shrub Layer**	**Herb Layer**	**Moss, Lichen**	**Coarse Woody Debris**	**Non-native**
Overall Cover by Layer	T*	40-50	20	60-75	15-20	20-30	60-70	10-15	T-1

* T= trace <1%

Table A3.1.3. Ecological community 1. Mature lowland forest. Tree and shrub species.

Polygon 1 Mature lowland forest Tree and Shrub Species	**Percent Cover (%)**				**Notes**
	Main Canopy	**2ndary Canopy**	**Shrub**	**Invasive Non-native**	**Age** (yrs), **DBH**=diameter at breast height (mm), **CWD**=coarse woody debris (logs, stumps, branches on ground)
Height (m)	30-40+	10-30	< 10		
bigleaf maple (*Acer*		T*			Near road in the south portion, Ht ~20m, DBH 355

macrophyllum)					
Douglas-fir (*Pseudotsuga menziesii)*	5-30	1-5	T		Main: DBH 475-990, Age 80y +, Secondary: 240-380. Snags 10 & 30m high, also 1 veteran Age 200+
grand fir (*Abies grandis)*	5-15	T-2	T		Main: DBH 420-695, Secondary: DBH 355. Shrubs more numerous in N end of the north portion
Sitka spruce (*Picea sitchensis)*			T		Height close to 10m
western hemlock (*Tsuga heterophylla)*	5	5-15	2-10		Main DBH 420-585, Secondary: 300-380, many shrubs on stumps
western redcedar (*Thuja plicata)*	5-10	5-10	T-5		Main DBH 680-1540, Secondary: 190-330, many shrubs on stumps
holly, English (*Ilex aquifolium)*				T-1	Occasional, but some patches with tall shrubs and many small plants
huckleberry, red (*Vaccinium parvifolium)*			1-2		
Oregon-grape, dull (*Mahonia nervosa)*			2-5		In bloom, patches
rose, dwarf (*Rosa gymnocarpa)*			T		
salal (*Gaultheria shallon)*			T-2		Most growing on old CWD or in the south portion near the logged patch
twin flower (*Linnaea borealis)*			T-1		Especially in openings

* T= trace <1%

Table A3.1.4. Ecological community 1. Mature lowland forest. Herb and moss species.

Polygon 1 Mature lowland forest Herb and Moss Species	**Percent Cover (%)**			**Notes**
	Herb Layer	**Moss, Lichen**	**Non-native**	
Herbs				
bedstraw species (*Galium spp)*	T*			

fern, lady (*Athyrium filix-femina)*	T			
fern, licorice (*Polypodium glycyrrhiza)*	T			
fern, sword (*Polystichum munitum)*	2-40			
three-leaved foamflower (*Tiarella trifoliata)*	1-2			
rattlesnake plantain *(Goodyera oblongifolia)*	T			
grass species	T		T	
Lyall's anemone (*Anemone lyallii)*	T			
rattlesnake plantain *Goodyera oblongifolia*	T			
sandwort, big-leaved (*Moehringia macrophylia)*	T			Patch seen in the north portion NE
Scouler's harebell (*Campanula scouleri)*	T			
speedwell, thyme-leaved (*Veronica serpyllifolia)*	T			
starflower (*Trientalis latiflolia)*	T			
vanilla leaf (*Achlys triphylla)*	5-30			In bloom
wall lettuce (*Lactuca muralis)*	T			
Mosses				
*Dicranum sp m*oss		T		
Hylocomium splendens (step moss)		50		On ground and on CWD^
Isothecium myosuroide (cattail moss)		P		Mostly on tree trunks
Kindbergia oregana (Oregon beaked moss)		P*		
Kindbergia praelonga (slender beaked moss)		P		
*Leucolepis acanthoneuron (*Menzies' tree moss)		P		
Plagiothecium undulatum (flat moss)		P		
Rhytidiadelphus loreus (lanky moss)		P		
*Rhytidiadelphus triquestrus (*electrified cat's-tail moss)		P		
Other mosses on tree trunks and CWD				Numerous

^ CWD = coarse woody debris on ground

* PD = present and dominant, P = present, T= trace <1%. Species' percent coverage was not attempted.

2. Grand fir / three-leaved foamflower (*Abies grandis / Tiarella trifoliata*) young recovering lowland forest community

Table A3.2.1. Ecological community 2. Young recovering lowland forest. Description.

Polygon Site	Polygon 2 Young Forest
Ecological Community	Young seral probably will be Western redcedar-Grand fir-Foamflower
Classification	Probably CDFmm 06
Structural Stage	4-5 pole-sapling to young forest at 35 yr

Status (BC List)	Probably future Red
Slope (%) and Aspect (°)	Largely flat with some hummocks
Photostation	Photo collage 23
Ecological Community Description	Recovering forest in the north portion of property was logged in 1984. Tree species composition varies across the polygon but is primarily young western hemlock at approximately 20-25m in height. Forest is just emerging from dark canopy closure stage. In some areas, many of the western hemlocks are dying and falling over, particularly on the public trail area. Understory is very limited with traces of a variety of species. Herb layer is also underdeveloped and has traces of many species. Many old, burnt springboard stumps remain, as well as mossy hummocks of old dead trees and more recent small stumps.
Disturbance Notes	The polygon was high-grade logged in the early 1900s and the springboard stumps date from that era. In 1984, the polygon was clear-cut with the creation of skidder roads that are now becoming visible as stump-less spaces through the young forest. A public trail leads from Pickles Road south through the polygon, in the southern portion of the north portion, to join with trails in the new provincial park.
Anticipated Change/ Succession	As the forest matures, the Western hemlocks will thin, and many will be replaced by the young grand firs, Douglas-firs, and western redcedars that are growing here. The hemlock death will result in a continuing potential for wind-throw of these dead trees and will increase the coarse woody debris on the forest floor. Changing climate may lead to less western hemlock in the future canopy.
Wildlife Observations	Wildlife-use of this polygon was likely reduced while the canopy was closed but is beginning again, especially with woodpeckers using the debris and flycatchers probably foraging on insects in the growing canopy and dying wood. Springboard stumps and large old coarse woody debris on the ground are valuable, particularly for moisture-dependent invertebrates and amphibians.

Table A3.2.2. Ecological community 2. Young recovering lowland forest. Vegetation cover by layer.

Polygon 2 Young lowland forest Vegetation Cover	**Percent Cover (%)**								
	Above Main Canopy	**Main Canopy**	**Secondary Canopy**	**Total Canopy Cover**	**Shrub Layer**	**Herb Layer**	**Moss, Lichen**	**Coarse Woody Debris**	**Non-native**
Overall Cover by Layer	<5	to 90	to 30	to 90	2-10	5-10	40-50	15+	T*

* T= trace <1%

Table A3.2.3. Ecological community 2. Young recovering lowland forest. Tree and shrub species.

Polygon 2 Young Forest Tree and Shrub species	**Percent Cover (%)**					**Notes** **Age** (yrs)**, DBH**=Diameter at Breast Height (mm)**, CWD**=coarse woody debris (logs, stumps, branches on ground)
	Above Main Canopy	**Main Canopy**	**2ndary Canopy**	**Shrub**	**Non-native**	
Height (m)	**>30**	**20-30**	**10-20**	**<10**		
bigleaf maple (*Acer macrophyllum)*		T*				At least 1, multi-trunk at base, DBH 946, occasional tiny maple seedlings
Douglas-fir (*Pseudotsuga menziesii)*		2+	5			Main: DBH 290-575, Secondary: DBH 80-145, Young trees in gaps and under canopy
grand fir (*Abies grandis)*			1-2			20m, DBH 150-205
red alder (*Alnus rubra)*			T-1			4 trees seen DBH 255-430
Western hemlock (*Tsuga heterophylla)*	T	20-30	10-30	T		Main and above: DBH 455-570, Secondary: DBH 180-275, lots at this height are dead or dying
Western redcedar (*Thuja plicata)*	<5	T	2-5			Above and those broken in Main: DBH 595-865, an old split trunk DBH 1260, Secondary : 440-455
blackberry, trailing (*Rubus ursinus)*				T-1		
crab apple, Pacific *(Malus fusca)*				T		Seedling on an old logging track
elderberry, red (*Sambucus racemosa)*				T		In centre of a gap, almost grown over
holly, English (*Ilex aquifolium)*					T	Patch near Pickles Road
huckleberry, red (*Vaccinium parvifolium)*				T		Occasional on track and near edges
Oregon-grape, dull (*Mahonia nervosa)*				1		Occasional plants, thin patches in hollows
rose, dwarf (*Rosa gymnocarpa)*				T		On old logging track
salal (*Gaultheria shallon*)				T		Occasional small young plant
twin flower (*Linnaea borealis)*				T		

* T= trace <1%

Table A3.2.4. Ecological community 2. Young recovering lowland forest. Herb and moss species.

Polygon 2 Young Forest Herb and Moss Species	**Percent Cover (%)**			**Notes**
	Herb Layer	**Moss, Lichen**	**Non-native**	
Herbs				
bedstraw species (*Galium spp)*	T*			
Bracken fern (*Pteridium aquilinum)*	1-2			Occasional
daisy, oxeye (L*eucanthemum vulgare)*			T	Old track in northeast
fern, sword (*Polystichum munitum)*	1-2			Occasional
three-leaved foamflower (*Tiarella trifoliata)*	T-1			Occasional to small patches
grass species	T			
hairy cat's ear (*Hypochaeris radicata)*			T	Old track in northeast
pathfinder plant (*Adenocaulon bicolour)*	T			
pipsissewa (*Chimaphila umbellata)*	T			Occasional
rattlesnake plantain *(Goodyera oblongifolia)*				
starflower (*Trientalis latiflolia)*	T			In bloom, small patches
vanilla leaf (*Achlys triphylla)*	2-10			Patches
violet, round-leaved (*Viola orbiculata)*	T			
wall lettuce (*Lactuca muralis)*	T			Old track in northeast
wood-rush (*Luzula sp.)*	T			Old track in northeast
Mosses				
Dicranum sp moss		P*		On CWD^
Hylocomium splendens (step moss)		PD		
Kindbergia oregana (Oregon beaked moss)		P		
Kindbergia praelonga (slender beaked moss)		PD		
*Leucolepis acanthoneuron (*Menzies' tree moss)		P		
Plagiothecium undulatum (flat moss)		P		On CWD
Rhytidiadelphus loreus (lanky moss)		P		
Others on tree trunks and coarse woody debris				

^ CWD = coarse woody debris on ground

* PD = present and dominant, P = present. Species' percent coverage was not attempted.

* T= trace <1%

3. Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii* / *Berberis nervosa*) dry forest community

Table A3.3.1. Ecological community 3. Dry forest. Description.

Polygon Site	Polygon 3 Dry Forest
Ecological Community	Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii* / *Berberis nervosa*)
Classification	CDFmm/01
Structural Stage	Mature forest
Status (BC List)	Red-listed
Slope (%) and Aspect (°)	The southern portion is a bowl with a 10% slope facing 65°. The northern portion is rolling, and there is a broad flat area about 25 m wide that lies between the bench (Polygon 7) and Pickles Marsh. The slope down to Kennedy Creek is 37% facing 270°.
Photograph	25
Ecological Community Description	Mature forest, 30-40m tall, of Douglas-fir and western redcedar with a predominantly low salal understory. Herb layer is sparse with mainly vanilla leaf and a mossy patch just below the ridge edge. Springboard stumps from the 1900s logging have burn-scars. Coarse woody debris accumulation on the ground is moderate. Includes at least one large 30m high snag and some wind-thrown trees, particularly on the west side near the ridge. Polygon slopes gently to the northeast, from the top of a ridge above Kennedy Creek towards Pickles Marsh, and is fairly dry and exposed.
Disturbance Notes	As noted, the area was logged in the early 1900s, and although there are more recently cut stumps, there has been little disturbance since the first logging. A small walking trail, similar to a deer path, crosses the polygon from the south to Pickles Marsh.
Anticipated Change/ Succession	The upper to mid-slope position results in a fairly well-drained and drying, gentle slope. A drying and warming climate may limit the growth and survival of the western redcedars, despite local moderating influence of the adjacent large marsh. Some wind throw-effects may also thin the Douglas-firs as they mature.
Wildlife Observations	The woody debris and stumps offer cover and foraging habitat, and the tree canopy provides coniferous-forest habitat suitable for birds to forage and nest. -. Signs of deer and red squirrel were frequent. This polygon provides a fairly open travel corridor to the marsh but lacks the complex edge and diverse wildlife habitat of other polygons in the Reserve.

Table A3.3.2. Ecological community 3. Dry forest. Vegetation cover by layer.

Polygon 3 Dry forest Vegetation Cover	**Percent Cover (%)**							
	Main Canopy	**2ndary Canopy**	**Total Canopy Cover**	**Shrub Layer**	**Herb Layer**	**Moss, Lichen**	**Coarse Woody Debris**	**Non-native**
Overall Cover by Layer	30-50	15-20	60-70	80+	10-15	50	10	T*

* T= trace <1%

Table A3.3.3. Ecological community 3. Dry forest. Tree and shrub species.

Polygon 3 Dry forest Tree and Shrub species	**Percent Cover (%)**					**Notes** **DBH=**Diameter at breast height (mm), **CWD=**coarse woody debris
	Veteran Tree Canopy	**Main Canopy**	**2ndary Canopy**	**Shrub**	**Invasive Non-native**	
Height (m)		30-40+	15-20	<10		
Douglas-fir (*Pseudotsuga menziesii*)		30	2-5			DBH Main 700-810 2ndary 210-300
fir, grand (*Abies grandis)*				T*		Occasional
hemlock, western (*Tsuga heterophylla*)		2	1-2	5		DBH Main: 460-580 Secondary: 290-330
redcedar, western (*Thuja plicata)*		1	10	5-10		DBH Main: 590-845, Secondary: 270-450
holly, English (Ilex aquifolium)					T	
huckleberry, red (*Vaccinium parvifolium*)				5-10		
Oregon-grape, dull (*Mahonia nervosa*)				15		Large patches, bloom, early berry
salal (*Gaultheria shallon*)				60-70		Mostly low ≤1 m

* T= trace <1%

Table A3.3.4. Ecological community 3. Dry forest. Herb and moss species

Polygon 3 Dry forest Herb and Moss Species	**Percent Cover (%)**			**Notes**
	Herb Layer	**Moss, Lichen**	**Non-native**	
Herbs				
bedstraw species (*Galium spp*)	T*			
coralroot, spotted (*Corallorhiza maculatta*)	T			

fern, bracken (*Pteridium aquilinum*)	T			
fern, spiny wood (*Dryopteris expansa*)	T			
three-leaved foamflower (*Tiarella trifoliata)*	T			
grass species	T		T	
Lyall's anemone (*Anemone lyallii)*	T			
sedge species (*Carex sp.)*	T			
starflower T*rientalis latiflolia*	T			Blooming throughout
vanilla leaf (*Achlys triphylla)*	10			Blooming, widespread patches
violet, round-leaved (*Viola orbiculata)*	T			
Mosses				
Hylocomium splendens (step moss)		40-50		
Kindbergia oregana (Oregon beaked moss)		10-15		
Rhytidiadelphus loreus (lanky moss)		P*		On CWD^ on ridge
Others on tree trunks and coarse woody debris		P		

* P = present, T = trace <1%. Species' percent coverage was not attempted.

^ CWD = coarse woody debris on ground

4. Western redcedar / sword fern - skunk cabbage (*Thuja plicata / Polystichum munitum - Lysichiton americanus*) wetlands

The creek and wetland polygon is extremely variable with respect to cover and species composition. In the north portion of the Reserve, sedge (*Carex obnupta*) extends widely into the periphery around large areas of open wetlands that surround the creeks, and these sedge areas are included in the polygon. Where present, trees in this periphery area tend to be growing on small raised hummocks where any accompanying species are similar to those of the young or mature forest polygons. As already noted, reed canary grass is present in areas along the edges of creek channels, as well as in a section of what was likely a logging equipment track, along a portion of the west side of Beaver Pond Creek wetland, which is both low lying and likely compacted. There have been other beaver dams along the creeks and there are pools and creek channels that, this year, are holding water well into July. Thus, there is more diverse aquatic vegetation in these areas. These creeks and wetlands are subject to change resulting from the activities of beavers, as well as changing temperature and moisture conditions.

In the south portion of the Reserve, variably sized areas of sedge (*Carex obnupta*) and skunk cabbage (*Lysichiton americanus*) occur along the sides of Kennedy Creek (Photo A4-1) throughout its length, until near the southern border, where the creek widens into a larger wetland, approximately 20 m across (Photo 18). As already noted, the south

portion of the polygon has been free of human interference since the first historic logging, except for the crossing of the creek at the east end of polygon 6. As with the other wetlands, the wetlands in the south portion are dependent on water flows from the surrounding watershed, so future changes will be influenced by human activities upstream and overall climate effects. Also, beavers could dam this creek, as they may have in the past, creating standing water pools and changing the vegetation. Deer, and possibly other wildlife, have been heavily browsing the skunk cabbage along the creek.

Photo A4- 1. Small wetland areas along Kennedy Creek.

Table A3.4.1. Ecological community 4 Creeks and wetlands. Description.

Ecological Community	Western redcedar / sword fern - skunk cabbage (Thuja plicata / Polystichum munitum - Lysichiton americanus)
Classification	CDFmm/Ws53
Structural Stage	Mature wetlands along sections of creek edges in the north portion and all of wetlands in the south portion. In the north portion, sections of creek edges were damaged in 1984, so they are younger and some have disclimax reed canary grass *(Phalaris arundinacea)*.
Status (BC List)	Blue-listed
Slope (%) and Aspect (º)	Fairly flat. Incline of creeks <5%
Photograph	13, 14, 15
Ecological Community Description	Slough sedge (*Carex obnupta*) dominated wetlands along four small creeks in a low-lying depression next to a peat-based marsh. Wetlands cover an area of approximately 1.5 ha and are largely open with occasional western redcedar, red alder (*Alnus rubra*), Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) on raised hummocks. Shrubs are present along the forest edge but few in the wetlands. Herb layer is variable but dominated by sedges, with

	pockets of skunk cabbage (*Lysichiton americanus*), particularly along creek edges and depressions, and with approximately 5-10% discliamx areas dominated by reed canary grass.
Disturbance Notes	Historically these wetlands may have been damaged by logging practices, and the south portion appears to have had an old railway mound crossing from that era. Since then, the south portion has remained undamaged. Portions of the wetlands along creeks in the north portion were damaged by log skidders removing trees in 1984. Beavers, as keystone species, are continually altering the wetlands. They have repaired and replaced the dams in this area over at least the last 30 years, altering flows in the creeks. Recently, the edge of Pickles Marsh, just inside the Reserve, was used for the cultivation of marijuana in 32 plastic-bag containers full of potting soil and fertilizer. These will be removed later in the summer after the major wetland wildlife activities.
Anticipated Change/ Succession	With the continuing presence and activities of the beavers on Pickles Marsh, the dams will be in place, creeks will continue to have flow during most of the year, and the water table will remain high. Surrounding trees will mature. Monotypic stands of reed canary grass may increase in open sites with full sun. Excessive climate-related drying or removing beaver would reduce and alter the wetland size and species composition.
Wildlife Observations	Beavers are active along the creeks and are responsible for creating and maintaining Pickles Marsh. The dammed water provides fresh water drinking, foraging, breeding, and shelter habitat for a host of species from invertebrates to other mammals. The edge habitat along the creeks is also valuable to wildlife, particularly as seen in the increased diversity and activity of the bird community.

Table A3.4.2. Ecological community 4 Creeks and wetlands. Overall Species List.

Species are listed without a % coverage as the area is extremely varied. Forest species that occur in the surrounding polygons and are present on raised hummocks within polygon 4, are not included, unless non-native or prominent.

Polygon 4 Creek and wetlands Overall Species List	**Notes**
Trees	
alder, red (*Alnus* rubra)	Occasional in periphery and on hummocks
Douglas-fir (*Pseudotsuga menziesii*)	Occasional in periphery and on hummocks
fir, grand (*Abies grandis)*	Occasional in periphery and on hummocks
hemlock, western (*Tsuga heterophylla*)	Occasional in periphery and on hummocks
maple, bigleaf (*Acer macrophyllum*)	Occasional in periphery and on hummocks
redcedar, western (*Thuja plicata)*	Occasional in periphery and on hummocks
Shrubs	
blackberry, evergreen (*Rubus laciniatus*) **	
blackberry, Himalayan (*Rubus discolour*) **	
blackberry, trailing (*Rubus ursinus*)	

cascara (*Rhamnus purshiana*)	
crab apple, Pacific *(Malus fusca)*	
currant, stink (*Ribes bracteosum*)	Kennedy Creek wetland
huckleberry, red (*Vaccinium parvifolium*)	
rose, dwarf (*Rosa gymnocarpa*)	
salmonberry (*Rubus spectabilisabilis*)	
spiraea (*Spiraea douglasii spp. Douglasii*)	
Herbs	
bulrush, small-flowered (*Scirpus microcarpus*)	
bracken fern (*Pteridium aquilinum*)	Just emerging, probably incr. %
daisy, oxeye (L*eucanthemum vulgare*) **	Occasional
fern, deer (*Blechnum spicant*)	Occasional and on maples
fern, lady (*Athyrium fil*ix-femina)	Varies throughout
fern, maidenhair (*Adiantum pedatum*)	
fern, spiny wood (*Dryopteris expansa*)	Occasional on CWD*
fern, sword (*Polystichum munitum*)	Varies throughout
foam flower (*Tiarella trifoliata*)	Occasional
foxglove (*Digitalis purpurea*) **	Along East Creek, etc.
grass species **	
grass, reed canary (*Phalaris arundinacea*) **	In the south portion Creeks, patches, esp. near creek mouths, along East Ck, and west side of Beaver Pond Creek
hairy cat's ear (*Hypochaeris radicata*) **	East Creek, mouth, and patch at Beaver Pond
horsetail, common (*Equisetum arvense*)	Large areas throughout
miner's lettuce, siberian (*Claytonia sibirica*)	
mint, Canada (*Mentha arvensis*)	
monkey-flower (*Mimulus moschatus*)	
pathfinder plant (*Adenocaulon bicolour*)	
rush species *Juncus* sp.	
rush, common (*Juncus effusus*)	Various
rush, dagger-leaved (*Juncus ensifolius*)	Various
sedge species *Carex* sp to be identified	Few at East Creek mouth and at Beaver Pond
sedge species *Carex* sp to be identified	Patches in damp forest
sedge species *Carex* sp to be identified	Isolated patch East Creek near mouth
sedge, slough (*Carex obnupta*)	Throughout, varies
skullcap, marsh (*Scutellaria galericulata*)	Beaver Pond
skullcap, blue (*Scutellaria lateriflora*)	Beaver Pond
skunk cabbage (*Lysichiton americanus)*	Varies
speedwell, thyme-leaved (*Veronica serpyllifolia*)	
spike-rush, creeping (*Eleocharis palustris*)	Beaver Pond
water-parsely, Pacific (*Oenanthe sarmentosa*)	
wood-rush, many-flowered (*Luzula multiflora*)	

**Non-native species

5. Marsh and shallow-water communities

a. Pickles Marsh Inlet. Combination of common cattail marsh (*Typha latifolia*) and shallow water communities: yellow pond-lily (*Nuphar lutea ssp polysepala*) and common pondweed *(Potamogeton natans*) predominantly shallow water communities

Photographs show the beaver dam and inlet at different seasonal stages: winter (March) when the water level is high and vegetative growth is limited, spring (May) as vegetation begins to grow, and summer (June) as the emergent and floating vegetation develops. Later in the year, water levels likely drop and vegetation growth gradually declines.

b. Beaver Pond: Shallow water community: yellow pond-lily (*Nuphar lutea ssp polysepala*) in an encroaching sedge-dominated wetland/creek complex

Photographs show the seasonal change from winter when the pond has no vegetation to mid-summer when vegetation covers the surface and the water level is low.

Table A3.5.1. Ecological community 5. Shallow waters. Description.

Polygon Site	5a Shallow-water Pickles Marsh	5b Shallow-water Beaver Pond
Ecological Community	Common cattail (*Typha latifolia*) marsh and shallow-water communities: yellow pond-lily (*Nuphar lutea ssp polysepala*) and common pondweed (*Potamogeton natans*)	Sedges and yellow pond-lily (*Nuphar lutea ssp polysepala*) shallow-water community
Classification	CDFmm/Wm05 and unclassified	Unclassified
Structural Stage	Beaver-influenced. Being naturally modified regularly.	Beaver-influenced. Being naturally modified.
Status (BC List)	Blue and NA	NA
Slope and Aspect	Flat	Flat
Photographs	1, 17	30
Ecological Community Description	An approximately 0.06-hectare, partially open water-inlet off a large mixed Wm05/Wm06 marsh is in the Reserve. The 1-2 m wide rim of common cattail lies along the 60m beaver dam. The shallow-water of the marsh has about 10-15% yellow pond-lily and 70+% common pondweed.	An approximately 15m beaver dam across Beaver Pond Creek causes ponding that is open in winter and gradually dries in summer to about a 10m diameter pond of about 50% yellow pond-lily. The predominantly sedges, with other wetland species, gradually advance as the surface water dries.

Disturbance Notes	Beavers (*Castor canadensis*) have raised the water level of the marsh by creating several dams across drainage creeks. There appears to be the remains of an earlier dam behind the current East Creek dam. Dead flood-killed second-growth trees in other parts of the marsh indicate that water levels were lower for at least 30+ years. This whole area is likely in flux continually, depending on the presence of beavers. Large trees at the marsh edge suggest that the area was not damaged in the 1984 logging.	Beavers probably use the creek and cause more alterations when water levels are high. Earlier logging practices, plus the beaver, have disturbed this area. Deer trails through the sedge were the only evidence of disturbance noted in the summer.
Anticipated Change/ Succession	Water levels and vegetation growth will fluctuate with the condition and height of the beaver dams and amount of water available. Reed canary grass areas may increase in abundance and other invasive species may become established.	
Wildlife Observations	Current water levels and vegetation are dependent on the beaver populations. A beaver track entering Pickles Marsh in polygon 5a allows non-flying species to easily access the fresh water source, even in periods of thick vegetation growth. The beaver pond is also an easily accessed source of fresh water. Nesting ducks, other birds, and other aquatic species (amphibians, invertebrates) reproduce, forage, and shelter in the area.	

Table A3.5.2. Ecological community 5. Shallow waters. Vegetation cover by layer.

Polygon 5 Shallow-water Vegetation Cover	**Percent Cover (%)**								
	Veteran Trees	**Main Canopy**	**2ndary Canopy**	**Total Canopy Cover**	**Shrub Layer**	**Herb Layer**	**Moss, Lichen**	**Coarse Woody Debris**	**Non-native**
Pickles Marsh	1-2			1-2	5	90			2-5
Beaver Pond					5-10	90		5+	

Table A3.5.3. Ecological community 5. Shallow waters. Tree and shrub species.

Polygon 5 Shallow-water Pickles Marsh/Beaver Pond Tree and Shrub species	**Percent Cover (%)**					**Notes:** DBH=diameter at breast height
	Veteran Trees	**Main Canopy**	**2ndary Canopy**	**Shrub**	**Non-native**	
Trees						
Douglas-fir (*Pseudotsuga menziesii*)	1-2/					
redcedar, western (*Thuja plicata)*	1/			1-2/		Trees are dead snags

Shrubs						
apple, Pacific crab (*Malus fusca*)			/3-5			
cascara (*Rhamnus purshiana*)			/3-5			
spirea (*Spirea douglasii spp. Douglasii*)			2-5/3			

Table A3.5.4. Ecological community 5. Shallow waters. Herb and moss species.

Many of the forest species were growing around the shallow-water areas and on any raised site or piece of coarse woody debris. This list refers to the aquatic species.

Polygon 5 Shallow-water Pickles Marsh/Beaver Pond Herb and Moss species	**Percent Cover (%)**			**Notes**
	Herb Layer	**Moss, Lichen**	**Non-native**	
Herbs				
bulrush, small-flowered (*Scirpus microcarpus*)	/1+			
cattail (*Typha latifolia*)	45/			Along beaver dam
duckweed species (*Lemna sp.*)	2+/			At beaver entrance
grass, reed canary (*Phalaris arundinacea*)			2-5/2+	
horsetail, common (*Equisetum arvense*)	/T*			On edge of Pond
pond-lily, yellow (*Nuphar lutea ssp polysepala*)	10-15/45+			
pondweed, common (*Potamogeton natans*)	45			
sedge, slough (*Carex obnupta*)	/10+			Pond edges
sedge species (*Carex sp.*)	/20			In Pond
spike-rush, creeping (*Eleocharis palustris*)	/T			Pond edges
water-parsely, Pacific (*Oenanthe sarmentosa*)	1/2+			

* T= trace <1%

6. Logging road clearing [Douglas-fir / dull Oregon-grape (*Pseudotsuga menziesii / Berberis nervosa*)] forest community

Photographs show how this polygon varies along its length, from dying young seral forest to occasional surviving seral western hemlock trees to an open shrub herb community.

Table A3.6.1. Ecological community 6. Logging road recovery. Description.

Polygon Site	6 Logging road clearing
Ecological Community	A recovering forest with compacted soils, formerly part of Polygon 1
Classification	Unclassified

Structural Stage	Maturing seral
Status (BC List)	NA
Photograph	Photo collage 24
Ecological Community Description	Recovery of the narrow strip of clear-cut vegetation is slow, probably due to the proximity of tall forests on both sides and compacted soil. Young western hemlocks (*Tsuga heterophylla*), 29 years old, are dying as they compete for nutrients and light, leaving a few healthy young trees, particularly on the north side in the western half. The eastern half is a herb-shrub community that becomes increasingly moist towards Kennedy Creek, where sword fern (*Polystichum munitum*) and salal (*Gaultheria shallon*) are replaced by deer (*Blechnum spicant*) and lady fern (*Athyrium filix-femina*).
Disturbance Notes	Polygon was cleared for a logging road in 1990. An old track is evident to the south of this polygon that begins at Pickles Road and crosses this polygon. It may have been a historic logging road or an access road to Pickles Marsh.
Anticipated Change/ Succession	This polygon will gradually develop into a mature forest, similar to Polygon 1. The terrain and soils may delay the process and continue to make the growth irregular. The polygon may continually lose trees to wind-throw and other stresses and may retain some of the moisture-favoring species in the eastern half.
Wildlife Observations	No unusual wildlife was identified in this polygon, although the moist lower half would be favoured by amphibians and some invertebrates.

Table A3.6.2. Ecological community 6. Logging road recovery. Vegetation cover by layer.

Polygon 6 Logging road clearing Vegetation Cover	**Percent Cover (%)**					
	Main Canopy	**Shrub Layer**	**Herb Layer**	**Moss, Lichen**	**Coarse Woody Debris**	**Non-native**
Overall Cover by Layer*	10-30	50-60	15-60	10-25	5-20	T*

* T= trace <1%

Note: Cover % varies from young seral forest to open shrub-herb area.

Table A3.6.3. Ecological community 6. Logging road recovery. Vegetation species.

Polygon 6 Logging road clearing Tree and shrub species	**Percent Cover (%)**					**Notes** All heights are estimates
	Main Canopy	**Shrub**	**Herb Layer**	**Moss, Lichen**	**Non-native**	
Trees						
hemlock, western (*Tsuga heterophylla*)	10-30	10-60				Up to 15m high
fir, grand (*Abies grandis)*		1-5				

Shrubs						
huckleberry, red (*Vaccinium parvifolium*)		1-3				
rose, dwarf (*Rosa gymnocarpa*)		T*				
salal (*Gaultheria shallon*)		5-30				
Herbs						
bedstraw, cleavers (*Galium aparine*)			T			
bedstraw species (*Galium spp*)			T			
fern, bracken (*Pteridium aquilinum*)			to 5			
fern, deer (*Blechnum spicant*)			5-10			
fern, lady (*Athyrium filix-femina*)			1			
fern, sword (*Polystichum munitum*)			10-15			
sedge species (*Carex sp.*)			T			
vanilla leaf (*Achlys triphylla*)			1-2			
wall lettuce (*Lactuca muralis*)			T			
Mosses						
*Hylocomium splendens (*step moss)				P		
Kindbergia praelonga (slender beaked moss)				P		
*Leucolepis acanthoneuron (*Menzies' tree moss)				P		
Rhytidiadelphus loreus (lanky moss)				P		
Others on tree trunks and coarse woody debris						

* P = present, T= trace <1%. Species' percent coverage was not attempted.

7. Creek-side bench [grand fir / three-leaved foamflower (Abies grandis / Tiarella trifoliata)] forest community

Table A3.7.1. Ecological community 7. Creek-side bench. Description.

Polygon Site	Creek-side Bench
Ecological Community	Predicted: grand fir / three-leaved foamflower (*Abies grandis* / *Tiarella trifoliata)*
Classification	Predicted - CDFmm/06
Structural Stage	Shrub-herb
Status (BC List)	Unclassified, Predicted - Red-listed
Slope and Aspect	Flat
Photograph	31
Ecological Community Description	A flat bench on the east side of Kennedy Creek is perhaps a disclimax community of low shrubs and herbaceous species. The shrub layer is diverse but low, sparse and predominantly salal (*Gaultheria shallon*), and sword fern (*Polystichum munitum*) dominates the herb layer. The moss layer is well developed.

Disturbance Notes	The history of human use of this bench is unknown and will be sought during the public consultation.
Anticipated Change/ Succession	If and how this bench may have changed in the last 30 years will be sought in the public consultation. This knowledge may help to determine the rate and nature of the possible changes. Young coniferous trees are present in the shrub layer, which suggests that, over time, the bench may become similar to the surrounding forest.
Wildlife Observations	No particular wildlife species were identified in this polygon, although the young recovering forest has been browsed by black-tailed deer (*Odocoileus hemionus columbianus*).

Table A3.7.2. Ecological community 7. Creek-side bench. Vegetation cover by layer.

Polygon 7 Creek-side bench Vegetation Cover	**Percent Cover (%)**				
	Shrub Layer	**Herb Layer**	**Moss, Lichen**	**Coarse Woody Debris**	**Non-native**
Overall Cover by Layer	20-25	80	60	5	T*

* T= trace <1%

Table A3.7.3. Ecological community 7. Creek-side bench. Vegetation species.

Polygon 7 Creek-side bench Vegetation	**Percent Cover (%)**			
	Shrub	**Herb Layer**	**Moss, Lichen**	**Non-native**
Trees				
Douglas-fir (*Pseudotsuga menziesii*)	1			
fir, grand (*Abies grandis)*	2-3			
hemlock, western (*Tsuga heterophylla*)	3-5			
redcedar, western (Thuja plicata)	T			
Shrubs				
blackberry, trailing (*Rubus ursinus*)	T*			
huckleberry, red (*Vaccinium parvifolium*)	5			
Oregon-grape, dull (*Mahonia nervosa*)	2-3			
Oregon grape, tall (Mahonia aquifolium)	2-3			
salal (*Gaultheria shallon*)	10-15			
salmonberry (*Rubus spectabilis*)	1-2			
twin flower (*Linnaea borealis*)	T			
Herbs				
anemone, Lyall's (*Anemone lyallii*)		T		
bedstraw species (*Galium spp*)		T		
fern, bracken (*Pteridium aquilinum*)		T		
fern, deer (*Blechnum spicant*)		T		
fern, lady (*Athyrium filix-femina*)		T		
fern, spiny wood (*Dryopteris expansa*)		T		

fern, sword (*Polystichum munitum*)		40-50		
foam flower (*Tiarella trifoliata*)		1		
grass species ** also non-native		5		**
harebell, Scouler's (*Campanula scouleri*)		1		
hairy cat's ear (*Hypochaeris radicata)*				T
Pathfinder plant (*Adenocaulon bicolour)*		2		
rush species Juncus sp.		T		
sedge, Dewey's (*Carex deweyana*)		1-2		
sedge, slough (*Carex obnupta*)		T		
sedge species (*Carex sp.*)		1		
vanilla leaf (*Achlys triphylla*)		20		
violet, trailing (*Viola simpervirens)*		1		
Mosses				
Dicranum sp			PD^	
Hylocomium splendens (step moss)			P	
Kindbergia oregana (Oregon beaked moss)			P	
Kindbergia praelonga (slender beaked moss)			P	
*Leucolepis acanthoneuron (*Menzies' tree moss)			P	
*Plagiothecium undulatum (*flat moss)			P	
Rhytidiadelphus triquestrus (electrified cat's-tail moss)			P	
Other mosses present				

^ PD = present and dominant

* T= trace <1%, P = present. Species' percent coverage was not attempted.

**Non-native species

ISLANDS TRUST CONSERVANCY
Protecting Canada's Islands in the Salish Sea

Appendix 4. Letter to Neighbours

August 21, 2019

Dear Neighbour,

The Islands Trust Conservancy is updating its management plan for Inner Island Nature Reserve and we are interested in hearing from you.

The Inner Island Nature Reserve (PID 018-012-256; Lot A, Section 21, Denman Island, Nanaimo
District, Plan VIP55499) is a 9.4-hectare (23.2 acre) protected area located in north-central Denman Island, to the north and south of Pickles Road. A portion of Pickles Marsh, three creeks connected to the marsh, and a number of associated wetlands all lie within the Reserve. The Reserve protects mature and regenerating coastal Douglas-fir forests as well as this beaver created complex of creek and wetland habitat. The property is a central link connecting the surrounding network of 700 ha of protected lands, which includes the Denman Conservancy Association's 62-hectare Settlement Lands and the Denman Island Park and Protected Area established by BC Parks in 2013.

The Islands Trust Conservancy will work in partnership with the Denman Conservancy Association to manage the property to protect its natural values, sensitive ecosystems, and threatened species. Development of any kind, including disturbance to native vegetation, soils, and water flow, is prohibited. There are restrictions on the use of the property, outlined in a conservation covenant that is held by the Nature Conservancy of Canada, that have been put in place to protect the native plants and animals within the Reserve. We are now updating the management plan to guide management of the Reserve for the next ten years.

PHONE: (250) 405-5151 · FAX: (250) 405-5155 · 200-1627 FORT ST, VICTORIA, BC, V8R 1H8
ITCMAIL@ISLANDSTRUST.BC.CA · WWW.ISLANDSTRUSTCONSERVANCY.CA

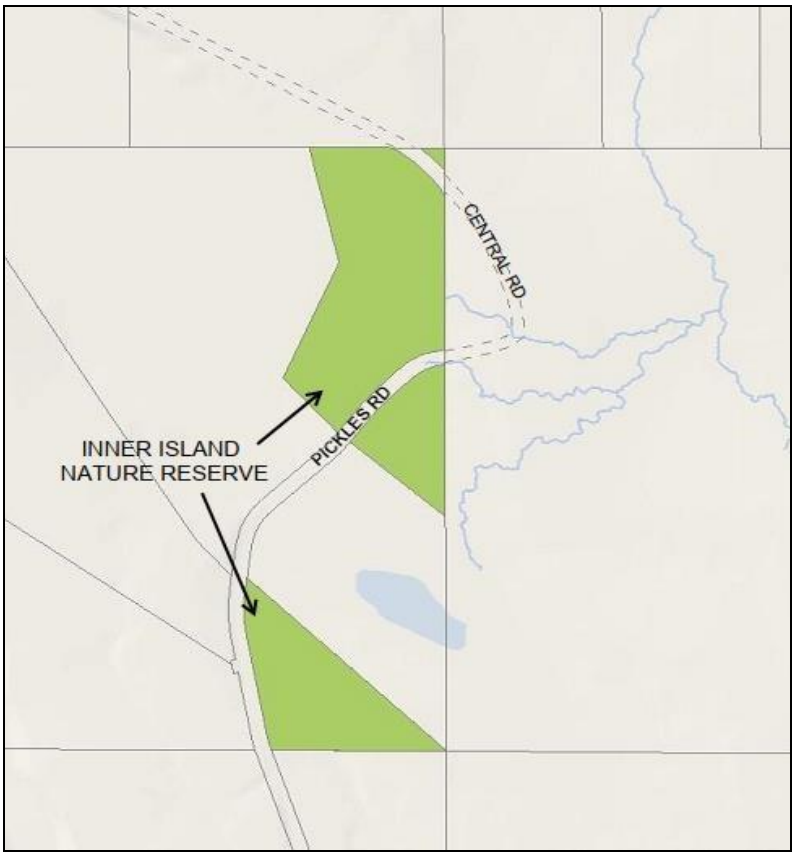
Your input is requested for the development of the next Inner Island Nature Reserve Management Plan. As a neighbour of the Reserve, we would like to hear your ideas and concerns regarding the long-term management of this special place. Please complete the enclosed questionnaire, which is also available online: www.surveymonkey.com/r/IINR.

The questionnaire can be completed online or returned to me by mail by September 20th, 2019, or dropped off in person at the Inner Island Nature Reserve management plan open house. The open house will be held on Saturday September 7th from 11-1 pm at the Marcus Isbister Old School Centre at 5901 Denman Road.

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

Sincerely,

Jemma Green
A/Property Management Specialist,
Covenant Management and Outreach Specialist
Islands Trust Conservancy
250-405-5193
jgreen@islandstrust.bc.ca



Inner Island Nature Reserve is located to the north and south of Pickles Marsh along Pickles Road.

Appendix 5. Questionnaire sent to Neighbours and Made Available at Open House and Online

Inner Island Nature Reserve Questionnaire

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1. Are you a resident of Denman Island?

◯ Yes, I live on north Denman Island
◯ Yes, I live mid-island
◯ Yes, I live on south Denman Island
◯ No, but I own property on Denman Island
◯ No, I'm a visitor

2. Have you ever visited Inner Island Nature Reserve? If so, how often?

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

3. If you have visited Inner Island Nature Reserve before, what did you do there?

◯ Hiking/walking
◯ Wildlife viewing
◯ Dog walking
◯ Other (please list):

4. Please list any wildlife and unique plant species you have seen in or near Inner Island Nature Reserve:

5. 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):

6. **What activities do you believe are incompatible with the protection of natural features, and should not be allowed within the Inner Island Nature Reserve?**

7. **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?**

8. **Please provide any other relevant information that will help us make the best management decisions for Inner Island Nature Reserve.**

9. **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.**

10. **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:**

Thank you for your time spent helping us plan the future of Inner Island Nature Reserve.

Appendix 6. Letter Sent to First Nations

Dear Chief and Council,

Re: Islands Trust Conservancy Nature Reserves on Sla-dai-aich/Ihaytayich (Denman Island)

The Islands Trust Conservancy, through its work as a land trust, is drafting management plans for the new Valens Brook Nature Reserve as well as for Inner Island Nature Reserve and Lindsay Dickson Nature Reserve on Denman Island.

The Islands Trust and the Islands Trust Conservancy wish to acknowledge First Nations treaty and rights within the Islands Trust Area and ensure that the direction of the management plans is reflective of both reconciliation and conservation goals; as well as, the cultural significance and traditional 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.

Valens Brook Nature Reserve (PID 028-931-734; Lot A, Section 6, Denman Island, Nanaimo District; Plan VIP89469 Except Parcel A (DD28585W) and PID 030-654-505; Lot 1, Section 6, Denman Island, Nanaimo District, District Plan EPP74292), Inner Island Nature Reserve (PID 018-012-256; Lot A, Section 21, Denman Island, Nanaimo; District Plan VIP55499) and Lindsay Dickson Nature Reserve (PID 009-706-071; The SE 1/4 of Sec. 14, Denman Island, Nanaimo District, Except part in plan VIP70081 and PID 009-705-911; The SW 1/4 of Sec. 14, Denman Island, Nanaimo District Except the Northerly 40 acres and part in Plan VIP70081) together make up over 68 hectares of protected forests, wetlands, and streams on Denman Island (map attached). These nature reserves are home to many sensitive and provincially red- or blue-listed ecological communities and several species at risk, and they are a protective buffer for portions of Denman's two major salmon-bearing stream systems. ITC works in partnership with the Denman Conservancy Association to conserve the unique natural and ecological values of these lands.

The Conservancy is aware that there are sites of cultural and spiritual significance in these areas, and that there are registered archeological sites on Lindsay Dickson Nature Reserve and near Valens Brook Nature Reserve. In keeping with the Islands Trust Conservancy Reconciliation Declaration (attached), we would like to work with your Nation to protect and manage cultural heritage sites in these nature reserves in a way that is reflective of treaty, inherent rights, and the traditional territories of your Nation.

You may also be interested to know that the ITC has developed a draft management plan template that includes cultural heritage. I would be pleased to provide it to you, if you would like to comment on it.

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 BOḰEĆEN, Cowichan, Halalt, Homalco, K'ómok, Klahoose, Lake Cowichan, Lekwungen, Lyackson, MÁLEXEŁ, Penelakut, Qualicum, Scia'new, sel̓íl̓witulh, SEMYOME, Shíshálh, Snaw-naw-as, Snuneymuxw, Sḵwx̱wú7mesh, SȾÁUTW̱, Stz'uminus, SXIMEŁEŁ, T'Sou-ke, Tla'amin, Tsawwassen, We Wai Kai, Wei Wai Kum, W̱JOŁEŁP, W̱SIḴEM, and xʷməθkʷəy̓əm territories in which we live and work.