AQUAPARIAN
Environmental Consulting Ltd.

BIOPHYSICAL ASSESSMENT
1900 STALKER ROAD, GABRIOLA ISLAND, BC

Completed for:
C/O Seward Developments Inc

Via Email:
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1.0 INTRODUCTION

Aquaparian Environmental Consulting Ltd (Aquaparian) was retained to complete a Biophysical Assessment (BA) of 1900 Stalker Road, Gabriola Island BC. The parcel is located within Electoral Area B of the Regional District of Nanaimo (RDN) and is within the Islands Trust (IT) Gabriola Island Planning Area. A review of the Islands Trust MapIT interactive mapping system and the RDN's Official Community Plan (OCP) did not identify any Development Permit Areas (DPAs) that apply to the subject parcel. The parcel is 8.9 acres (3.6 ha) in area and is legally identified as follows:

- LOT 1, SECTION 4, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 16560 (PID 004-008-910).

A site location map of the study area in relation to Gabriola Island has been included in this report as Figure 1a with a close-up of the parcel as Figure 1b. A selection of site photographs taken during the site survey has been included as Appendix A.

In preparation for this report, Aquaparian has reviewed the RDN's OCP, RDN and IT bylaws, and relevant provincial government databases to collect background information for the site. Aquaparian completed a site assessment of the property on October 9, 2024. As understood, the waterfront property is developed with three cottages that are owned by three separate families, and the owners intend to subdivide the parcel to create three separate strata lots that each contain one of the cottages. A 0.3 acre (0.12 ha) strip of the parcel along the south side will be donated as park land. The remaining 3.73 acres (1.76 ha) will be common property containing the access driveways and a privacy buffer for the adjacent public park to the south. A site plan has been provided by Turner & Associates Land Surveying and is included with this report as Figure 2.

This BA has been prepared to provide a characterization of the study area including identification of environmentally sensitive features and attributes found within and adjacent to the parcel. This report has been prepared to reflect the Islands Trust Conservancy Baseline Inventory Standard. This assessment is required to support a rezoning application to the Islands Trust and a future subdivision. The BA will also identify any environmental regulatory approvals or permits required for any potential future development. As understood, no development is planned at this time, so this assessment has been prepared assuming no changes are proposed outside of lot creation.

2.0 REGULATORY FRAMEWORK

The following is a list of federal, provincial and municipal environmental regulations, current at the date of preparing this report, that *may* apply to development of the subject parcel:

Federal *Migratory Birds Convention Act, 1994*. Most species of birds in Canada are protected under this act. "Migratory birds" are defined by Article I of the Convention which names the families and sub-families of birds protected and provides some clarification of the species included. In general, birds not falling under federal jurisdiction within Canada include grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays, kingfishers, and some species of blackbirds.

Federal Migratory Birds Regulations, 2022 (MBR), provides protection to migratory bird nests when they are considered to have a high conservation value for migratory birds. The MBR prohibits the damage, destruction, removal or disturbance of nests of all migratory birds when there is a live bird or viable egg, or if the nest was built by a species that is listed in Schedule 1 of the regulation. Schedule 1 lists 18 species which are protected year-round unless their nests are shown to have been abandoned for a designated period of time depending on the species. In BC there are only two Schedule 1 species; great blue herons are protected for 24 months after reporting the nest is unoccupied, and pileated woodpecker are protected for 36 months after reporting unoccupied.

***Species-at-Risk Act*.** The *Act* is a key federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides for the legal protection of wildlife species and the conservation of their biological diversity. This Act applies to Federal lands. It also applies to critical habitat on private lands and:

- all endangered, threatened and extirpated migratory birds listed in Schedule 1 of SARA and protected by the *Migratory Birds Convention Act*, 1994, anywhere they occur, including private lands, provincial lands and lands within a territory; and
- all endangered, threatened and extirpated aquatic species listed in Schedule 1 of SARA, anywhere they occur, including private lands, provincial lands and lands within a territory.

Section 34 of the Provincial *Wildlife Act*, states that a person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys:

- a bird or its egg,
  (b) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or
  (c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.

During the nesting season, clearing vegetation in proximity of an active nest may 'molest' the nesting birds, and could result in an offense. Provincial guidelines indicate the songbird nesting season in this area for forest habitat is from March 15th to August 15th of a given year. Some raptors (bald eagle, hawks, owls etc.) and great blue herons start earlier in the year; nesting for these species can start as early as January or February and extend until August 15th of a given year.

Heritage Conservation Act. All archaeological sites, recorded or not, are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit from the Archaeology Branch. As understood, municipalities have access to provincial records that show recorded sites and sites with high potential for archaeological resources. If a known site is located on the parcel, an archaeological consultant will need to be retained to provide advice. If the site has a high potential, it is recommended to retain and archaeological consultant to provide recommendations. Archaeological assessments are outside the scope of this report.

3.0 SITE DESCRIPTION

The subject parcel is irregularly shaped and located on the east side of Gabriola Island, waterfront to the Strait of Georgia. The parcel is mostly forested and developed with three family cottages and some small ancillary buildings. Each cottage has a back yard/lawn area that has been cleared when the cottages were constructed in the 1970s. The property is a panhandle lot, accessed from the end of Stalker Road to the west via a long gravel driveway that splits within the larger property to provide access to each cottage. Drumbeg Provincial Park (66 acres (26.7 ha)) is situated to the south and west, and private property is located to the north.

The site was traversed by Aquaparian (Oct. 9, 2024) by foot and observations of ecological characteristics including topography and species composition were documented throughout the parcel. Five sample plots were assessed to collect detailed observations of the forest composition. The site is approximately 75% forested with a second growth dry Douglas fir (*Pseudotsuga menziesii*) forest that has been selectively logged in the past. Large, veteran trees are scattered throughout the forest. Overall, the parcel slopes gently to the east towards the ocean with a low sandstone bedrock shoreline at the north end, and small pocket beaches moving south. The forest terrain is relatively flat to slightly hummocky. The west side of the parcel where the panhandle driveway is located is undulating. No watercourses or wetlands were identified. A map of ecosystem polygons identified within the parcel is included as Figure 3.

4.0 ENVIRONMENTAL SETTING

4.1 Physical Resources

The following section provides a general overview of biophysical attributes and land use of the site documented by government databases, crown publications and from Aquaparian's reconnaissance of the property.

4.1.1 Topography

The site ranges in elevation from 22m above sea level at the west side near the entrance down to 0m at the shoreline to the east. There is a low rocky slope (~1m high) at the northeast side and more gradually sloped beaches to the southeast. There is a small hill along the panhandle driveway, but no other steep slopes exist. The forested portion of the parcel is gradually sloping and only hummocky at the west side.

4.1.2 Climate

The property is located within the Moist Maritime Coastal Douglas-fir Subzone (CDFmm). The CDFmm is restricted to low elevations along southeast Vancouver Island from Bowser to Victoria, the Gulf Islands south of Cortes Island, and a narrow strip along the Sunshine Coast near Halfmoon Bay. Elevational limits typically range from sea level to approximately 150m.

The CDFmm lies in the rain shadow of the Vancouver Island and Olympic Mountains resulting in warm, dry summers and mild, wet winters. Growing seasons are very long and feature pronounced water deficits on zonal and drier sites. The CDFmm represents the mildest climate in Canada. *(Green and Klinka).*

4.1.3 Land/Soil

A review of the technical report No. 43 "Soils of the Gulf Islands of British Columbia – Volume 4 Soils of Gabriola and Lesser Islands" (1990) and map indicates soils found within the study area are comprised of Bellhouse (BH) soils along the east side of the property and Saturna (ST) soils over the rest of the property. Both soils are derived from sandstone origins.

Bellhouse soils are rapidly to well-drained soils that have developed on shallow colluvial and glacial drift materials of channery, sandy loam texture over fractured or smooth, unweathered sandstone bedrock within 100cm. Coarse fragment content varies between 20 and 50%. The soil has dark-coloured Ah horizon of at least 10cm thick that is high in organic matter content. The Bellhouse landscape consists of shallow soils over bedrock on gently to moderately sloping (2-15%) topography in subdued (undulating) terrain, and in some places on steeply sloping (16-

30%) sideslopes of rock ridges. (Kenney *et al.* 1990).

Saturna soils are well-drained soils that have developed on shallow deposits of channery sandy loam textured colluvial and glacial drift over sandstone bedrock within 100cm of the surface. Coarse fragment content varies between 20 and 50%. These soils are associated with gently to strongly sloping (6-30%) topography in subdued to hummocky terrain or on very strongly to steeply sloping (31-100%) side slopes of rock ridges. (Kenney *et al.* 1990).

4.1.4 Surface Water

A review of the Provincial Habitat Wizard database, the Gabriola Island MapIT, and the RDN map did not identify any watercourses within the subject parcel. No watercourses or wetlands were observed. There is a small (3-4m) long section of ditch along a low part of the driveway that appears to direct water into the forest, no channel was observed. Soils and vegetation are indicative of dry conditions and no evidence of saturated soils was observed. Drumbeg Provincial Park has a small watercourse that originates southwest of the subject parcel and flows south to the ocean; this appears to the closest freshwater feature.

4.1.5 Groundwater

The site is overall well-drained and dry. No seepage areas or vernal pools were observed in areas near the shoreline where thinner soils were noted. Thin, dry soils overlying bedrock make up most of the parcel. No saturated soils or patches of wetland plant species were observed within the parcel that would indicate areas with deep soils and a high water table.

The provincial map Groundwater Wells and Aquifers identifies that the parcel is dependent on Aquifer 709, a fractured sedimentary rock (bedrock) aquifer that is 46.8 km^2 and is rated as high vulnerability.

4.2 Biological Resources

4.2.1 Flora

The parcel has a relatively uniform dry Douglas fir ecosystem dominated by a selectively logged second growth canopy of Douglas fir with many large veteran trees spaced throughout. Fire scars on the base of mature trees indicate a past fire or controlled slash burning during logging practices. Towards the shoreline along the east side of the parcel there is an increase in arbutus (*Arbutus menziesii*) and Garry oak (*Quercus garryana*). The forest understory is predominantly comprised of grasses, dull Oregon-grape (*Mahonia nervosa*), salal (*Gaultheria shallon*), bracken fern (*Pteridium aquilinum*), sword fern (*Polystichum munitum*), oceanspray (*Holodiscus discolor*), baldhip rose (*Rosa gymnocarpa*), trailing blackberry (*Rubus ursinus*),

hairy honeysuckle (*Lonicera hispidula*), yerba buena (*Clinopodium douglasii*), herb-Robert (*Geranium robertianum*), sweet-scented bedstraw (*Galium trifolium*), and lesser amounts of woodland strawberry (*Fragaria vesca*), grand fir saplings (*Abies grandis*), invasive holly (*Ilex aquifolium*) and invasive Scotch broom (*Cytisus scoparius*). The Biogeoclimatic site series classification is 02 FdPl – Arbutus which is categorized by Very Dry soils with a Very Poor to Medium soil nutrient regime (Green & Klinka, 1994).

Towards the shoreline where the parcel has been cleared for recreational use and soils are thinner and drier, there are more grasses in the understory as well as weedy herbs including English plantain (*Plantago lanceolota*) and dandelion (*Taraxacum* sp.). The canopy is open, less than 20% overall cover and comprised of scattered clusters of trees. Bigleaf maple (*Acer macrophyllum*), arbutus, Garry oak and Douglas fir are scattered along the shoreline with some Nootka rose (*Rosa nutkana*), common snowberry (*Symphoricarpos albus*), and Saskatoon berry (*Amelanchier alnifolia*) comprising the limited shoreline understory. The site lacks rocky outcrops or moss and lichen communities; the backyard appears to be characteristic of lawn rather than terrestrial herbaceous meadow habitat. It may have supported patches of terrestrial herbaceous meadow habitat prior to development, or else forest cover extended up to the shoreline. Aquaparian completed the site visit during the fall (October) so spring flowering species were not identifiable; no seed pods or evidence of meadow wildflower species were observed. No seeps or vernal pools that typically support rare wildflower species were noted. A spring and summer wildflower study would be required to confirm the absence of sensitive wildflower species within the parcel.

There is distinct terrestrial herbaceous meadow habitat within south-facing open canopy habitat in Drumbeg Provincial Park. Along the south property line between the park and the subject parcel there have been restoration plots created through a joint effort between Gabriola Land & Trails Trust (GaLTT) and BC Parks to remove invasive Scotch broom and orchard grass (*Dactylis glomerata*) and plant native Garry oak meadow species such as common camas (*Camassia quamash*) and yarrow (*Achillea millefolium*). Along the southeast side of the parcel adjacent to the restoration area is a large patch of Scotch broom and Himalayan blackberry (*Rubus armeniacus*), invasive species that readily spread in open, disturbed areas.

In the northwest corner of the larger portion of the parcel there are some clusters of snags with woodpecker cavities observed. Towards the west end of the panhandle (driveway), there are some lower areas alongside the driveway supporting western redcedar (*Thuja plicata*), bigleaf maple, bitter cherry (*Prunus emarginata*), salmonberry (*Rubus spectabilis*) and moss indicating moister soils.

4.2.2 Fauna

The subject parcel offers good quality forest habitat for racoon (*Procyon lotor*), red-squirrel (*Tamiasciurius hudsonicus*), western deer mouse (*Peromyscus sonoriensis*), black rat (*Rattus rattus*), Vancouver Island vagrant shrew (*Sorex vagrans* ssp. *isolatus*), American mink (*Neogale vison*), northern river otter (*Lontra canadensis*), and black-tailed deer (*Odocoileus hemionus)* for cover, forage and as a wildlife corridor to other forested areas on the island. A variety of local bat species are expected to utilize wildlife trees for roosting and may find insect forage in the clearing. The property owners have installed some bat boxes around the property. River otter, Steller sea lion (*Eumetopias jubatus*), and harbour seal (*Phoca vitulina*) were documented swimming near the shoreline during the site visit and a sea lion haul-out area was heard to the east. Other marine mammals that may be seen in the Strait from the subject parcel include California sea lion (*Zalophus californianus*), orca (*Orcinus orca*), and humpback whale (*Megaptera novaeangliae*); and less commonly grey whale (*Eschrichtius robustus*) and minke whale (*Balaenoptera acutorostrata*).

The open grassy area may be ideal for reptiles such as the western terrestrial garter snake, subspecies wandering garter snake (*Thamnophis elegans vagrans*), northwestern garter snake (*Thamnophis ordinoides*), common garter snake (*Thamnophis sirtalis*), and the northern alligator lizard (*Elgaria coerulea*). These species are often associated with the edges of meadows and typically associated with conifer forests (*St. John, 2002*). All three garter snake species have been documented near the subject parcel in Drumbeg Provincial Park by users of *iNaturalist.* Sharp-tailed snakes (*Contia tenuis*) have been found on some of the Southern Gulf Islands, but no documented evidence of populations on Gabriola Island was available.

The site is very dry and lacks resources for amphibians. Limited large woody debris on the forest floor may offer breeding habitat for terrestrial salamanders, but the site lacks seasonal standing water to provide breeding habitat for aquatic salamanders or frog species.

A detailed survey to confirm wildlife species presence was not completed as part of this assessment.

4.2.4 Birds

A variety of resident and migratory bird species are likely to inhabit and utilize the forested site for cover, forage, and a wildlife corridor to surrounding forested sites. Many bird species are expected to utilize the property on a seasonal basis for nesting. The migratory bird nesting period recognized for the area is March 15th to August 15th. Bird species identified during the site visit include common raven (*Corvus corax*), belted kingfisher (*Megaceryle alcyon*), spotted

towhee (*Pipilo maculatus*), red-breasted nuthatch (*Sitta canadensis*), chestnut-backed chickadee (*Poecile rufescens*), golden-crowned kinglet (*Regulus satrapa*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), common loon (*Gavia immer*), and rufous hummingbird (*Amazilia tzacatl*).

Some clusters of standing dead trees (snags) were identified in the northwest portion of the property that would be expected to provide feeding, nesting and/or roosting habitat to some bird species such as woodpeckers and secondary cavity nesting species that are dependent on woodpecker cavities. No tree removal is planned so Aquaparian did not complete a comprehensive pileated woodpecker (*Dryocopus pileatus*) nest tree survey. No pileated woodpecker nest trees were confirmed during the site visit.

Reviews of the provincial Wildlife Tree Stewardship (WITS) identified one mapped bald eagle (*Haliaeetus leucocephalus*) nest within the property identified as BAEA-101-012 “Drumbeg Park A”. The status was registered as “Nest Down” in 2014. Aquaparian located the tree and noted the Wildlife Tree sign on its base but did not see an eagle nest. A messy stick nest was observed that was not large enough to be an eagle nest or deep enough for a heron. It is expected to be a nest of a smaller raptor species (e.g. hawk) or a corvid (e.g. raven). The property owners reported to have seen many eagles perching throughout the parcel along the shoreline over the years but have never seen them nesting within the property or within this wildlife tree. There is another mapped tree BAEA-101-037 located approximately 130m north of the parcel that was registered as “Tree Cut” in 2004. A review of the BC Great Blue Heron nest inventory database did not show any mapped great blue heron (*Ardea Herodias fannini*) nests within or adjacent to the parcel. Aquaparian did not identify any eagle or heron nests or evidence of eagle or heron nests (i.e. whitewash, prey remains, feathers, etc.) within the parcel. The site has suitable conditions for raptor habitat due to the abundance of mature trees including some old growth trees that would be capable of supporting a larger stick nest, and the proximity to the ocean. The site also has several larger snags and mature trees that could offer nesting opportunities for owls.

A detailed bird survey was not conducted during the assessment. Species presence will change seasonally throughout the year.

4.2.5 Fisheries

No freshwater fish habitat was identified on site. The shoreline is expected to be frequented by a variety of marine species. Boulder and bedrock shoreline to the south (Drumbeg Provincial Park) was observed to have perch swimming along rock, and some small sandy pocket beaches along the shoreline of the subject parcel may have limited forage fish spawning potential. The BC Eelgrass Inventory website shows eelgrass mapped north and south of the

subject parcel.

4.2.6 Sensitive Ecosystems Inventory Mapping

The Sensitive Ecosystems Inventory of southeast Vancouver Island and the Gulf Islands (SEI) systematically identified and mapped specific rare and fragile ecosystems in this region. The purpose of the SEI project was to identify remnants of rare and fragile terrestrial ecosystems and to encourage land-use decisions that will ensure the continued integrity of these ecosystems.

Seven sensitive ecosystem types were mapped in the east coast of Vancouver Island study area as follows: Wetland, Woodland, Riparian, Older Forest (>100yrs), Terrestrial Herbaceous, Sparsely Vegetated and Coastal Bluff. Two other important ecosystems were mapped for their general biodiversity and wildlife habitat values: Older Second Growth Forest (60-100yrs) and Seasonally Flooded Agricultural Fields.

Several maps regarding sensitive ecosystem polygons are available on the Islands Trust website, but the maps are not consistent with one another. A review of the 2007 Gabriola Island SEI map (*Islands Trust*) identifies that the west side of the parcel has a primary Wetland ecosystem polygon that transitions into a secondary Wetland ecosystem mixed with a primary non-sensitive ecosystem in the central portion of the parcel. No Wetland habitat is found within the subject property. The SEI (2007) map also indicates that the east side of the parcel has a primary Woodland ecosystem mixed with a tertiary Terrestrial Herbaceous ecosystem polygon along the east side; some elements of these ecosystems are found in the site but the habitat is not entirely consistent with the definitions of Woodland and Terrestrial Herbaceous habitat. Woodland habitat is typically restricted to south-facing slopes and ridges with dry, shallow soils with bedrock outcroppings, and can exist in areas with dry conditions that prevent the development of dense forests (*Islands Trust*). The site has deeper soils and if left to regenerate the forest would likely extend south with a canopy cover of greater than 30% as determined by clusters of trees observed along the east side of the parcel. Typical Woodland habitat has between 10% and 30% canopy cover while Terrestrial Herbaceous habitat has <10% canopy cover (*Islands Trust*). The SEI (2007) map has been included with this report as Figure 4.

The MapIT interactive map has a Sensitive Ecosystems Inventory (SEI) layer (Fig. 5a) that incorrectly maps the southeast 1/4 of the parcel as Cliff habitat, while the Islands Trust Ecosystem Mapping (ITEM) layer (Fig. 5b) identifies Terrestrial Herbaceous meadow habitat along a small southeast portion of the parcel which is currently dominated by invasive Himalayan blackberry and Scotch broom. While natural Terrestrial Herbaceous meadow habitat was confirmed in Drumbeg Provincial Park, the subject parcel *may* have historically supported this habitat particularly at the south east side, until it was developed for recreational use in the

1970s, though soils appear deeper and forest would likely regenerate over most of the cleared portion if left alone. A mapped polygon identified as “Modified” correlates with the cleared recreational portion of the parcel. There is also a Mature Forest polygon mapped over most of the parcel, but site reconnaissance determined that the forest ecosystem is better represented by selectively logged second growth forest. Mature Forest is defined as 80-250 years old which was only represented by scattered mature (80+ years) trees, while regenerated Young Forest (40-80 years) dominates the canopy.

4.2.7 Species-At-Risk

The federal *Species-at-Risk Act* (SARA) is designed to prevent or reduce the likelihood of wildlife species becoming extinct or extirpated and to provide for the recovery and management of endangered, threatened and species of special concern as a result from harm by human activity. Provisions of SARA include prohibiting the taking or possession of listed species and the damaging or destruction of their residence and critical habitat. On private lands, this *Act* applies to aquatic or migratory bird species listed on Schedule 1 or critical habitat of Schedule 1 listed species that have a recovery plan.

The provincial BC Conservation Data Centre (BC CDC) assists in conservation of biodiversity in the province by collecting and sharing information about wildlife and ecosystems in the province. Species and ecosystems are placed on a Red, Blue or Yellow list to rank them according to their conservation status. Provincially Red-Listed species includes any ecological community, and indigenous species and subspecies that is extirpated, endangered, or threatened in British Columbia. Red-listed species and sub-species may be legally designated as or may be considered candidates for legal designation as Extirpated, Endangered or Threatened under the *Wildlife Act*. Blue-Listed species includes any ecological community, and indigenous species and subspecies considered to be of special concern (formerly vulnerable) in British Columbia.

The BC Conservation Data Centre identifies ecosystems at risk based on species composition and habitat condition. A search of occurrence records for designated rare or endangered plant and animal species or ecosystems for the study area with the British Columbia Conservation Data Centre (BC CDC) resulted in no records within the subject site. One small species occurrence polygon of Macoun’s meadowfoam (*Limnanthes macounii*) (Polygon 6724) is located in Drumbeg Provincial Park and depends on the presence of seeps or seasonally wet depressions in meadow habitat. These microhabitats are not found within the subject property.

There are a number of at-risk species listed by the BC CDC Ecosystems Explorer search tool which are considered to have some potential to occur at the study site. The search parameters

used were: animals or plants; BC conservation status red or blue; Gabriola Island Local Trust Area; CDFmm biogeoclimatic zone(subzone); habitat types/subtypes conifer forest – dry. A copy of the BC CDC Ecosystem Explorer search results for the region has been included as Appendix B. Species generated by the search results that have a *reasonable potential* to be found within the site are discussed briefly below:

Common Nighthawk (*Chordeiles minor*): Provincially Blue-listed; SARA 1-SC (2023)

A member of the nightjar family. Feeds on flying insects (e.g., mosquitoes, moths, beetles, flies, caddisflies). Forages at night or during the day catching insects high in the air or close to the ground and may forage on insects around artificial lights. Habitats include open and semi-open areas: open coniferous forests, savanna, grasslands, beaches, fields, vicinity of cities and towns including disturbed sites. Nesting occurs on the ground (no nest-building) on a bare site in an open area. In some areas, this species also nests on flat gravel roofs of buildings, perhaps related to prey availability at artificial lights. It prefers areas with sandy soil. In BC, this species typically lays eggs in mid-May and incubation is 18 days on Vancouver Island. (*BC CDC*). The coniferous forest with its open understory and the clear, grassy open area to the east may offer nesting and forage habitat for this species. Be mindful of potential nesting on bare ground when landscaping (i.e. mowing) in the late spring and early summer. Eggs are highly camouflaged and hard to spot but adults may display nest behaviours such as feigning wing injury, leading away from nest, or beating wings and hissing when defending eggs (*Poulin et al. 1996*). If eggs or nesting behaviour are observed within the site, avoid disturbance and keep dogs away from the nesting location between May and June or until young have fledged.

Band-tailed Pigeon (*Patagioenas fasciata*): Provincially Blue-listed

The Canadian breeding range of this large pigeon is restricted to southern British Columbia, mainly on southern Vancouver Island and along the mainland coast. The Band-tailed Pigeon uses a variety of habitats in coastal B.C., including forest edges and openings, urban backyards, urban parks, bushland, golf courses, and orchards. Winter habitat includes open woodland and edges with berries and acorns. Fall migrants use open coniferous habitat near farmland, shorelines with mineral sites, riparian habitat, railways, farmyards, and regenerating clear-cuts. The Band-tailed Pigeon eats mainly grain, fruit, acorns, pine nuts, and the flowers and new buds of shrubs and trees. Primary threats to the Band-tailed Pigeon include forestry practices, urban and industrial development and climate change (*BC CDC August 2024*). The subject parcel provides some suitable habitat for band-tailed pigeons due to the intact forest canopy for nesting, acorns as a food source, and berry-producing shrubs (holly, salal, dull Oregon grape, blackberry) for forage. A mineral source is critical to offset the high potassium level associated with their fruit diet; typical mineral sources include underground springs,

deposits on soils, and marine beaches (*COSEWIC, 2008*). Primary threats to the Band-tailed Pigeon include forestry practices, urban and industrial development and climate change (*BC CDC*). Sightings of this species observed on Gabriola Island have been recorded on *iNaturalist*, including a sighting documented in Drumbeg Provincial Park.

Howell's Triteleia (*Triteleia howellii*): Provincially Red-listed

Grows in Garry oak woodlands. Deep, dark soils and an extremely rich understory of low shrubs characterise the Garry oak woodlands in the Cowichan Garry oak Preserve. This species also occurs in Garry oak – arbutus stands at the base of rock outcrops, where the well-developed shrub layer has a high cover of oceanspray and tall Oregon-grape. Disturbed sites include private yards and roadsides. Flowers in late May and June. Outcompeted by Scotch broom and invasive grasses. (*BC CDC*). According to the Salt Spring Island Conservancy website, this species favours high pH soil found on sites on old shell middens. As the subject parcel has a shell midden visible along the shoreline and Garry oak habitat it may support this species. A spring wildflower study was not completed as part of this project.

Hoary Bat (*Lasiurus cinereus*): Provincially Blue-listed

Vancouver Island's largest bat with adult body length of 120-146mm. This bat is typically solitary, except for mother-young association; however, may form groups of hundreds during migration. Habitat includes primarily deciduous and coniferous forests and woodlands, including areas altered by humans. Forages for insects, especially moths, over various open areas and along riparian corridors. Usually roosts in foliage of large coniferous or deciduous trees near the end of branches 9-13m above the ground. May roost in rock crevices but rarely in caves. Roost site fidelity is low. Likely overwinters in southeastern USA, Western California and Mexico. May hibernate in tree cavities, squirrel's nests or in a clump of Spanish moss. (*BC CDC*). The intact forest with mature trees, wildlife trees, and an open clearing may provide suitable habitat for this species. They are not typically associated with bat boxes (*Community Bat Programs of BC*).

Little Brown Myotis (*Myotis lucifugus*): Provincially Blue-listed; SARA Endangered (1-E (2014))

The core range of this species appears to be from the Alaska-Canada Boreal Forest south through the northeastern United States, with smaller populations in the southern and western United States. In the northeast, individuals may migrate hundreds of kilometers between winter and summer habitats; in the west, these bats are believed to hibernate near their summer range. These bats use a wide range of habitats including human-made structures for resting and maternity sites as well as caves and hollow trees. Winter hibernation sites have a stable

temperature of 2-12ºC and include caves, mines, tunnels, etc. Maternity colonies are commonly found in warm buildings (eg. attics) and less commonly in hollow trees. Foraging requirements are also generalized, typically over water, along stream and lake edges or in woodlands near water. (*BC CDC*). This species was changed from Yellow- to Blue-listed in 2022. The forest stand containing some large diameter trees, bat boxes, and wildlife trees may provide suitable roosting habitat for this species, and the open clearing area provides forage.

Northern pygmy owl, *swarthi* species (*Glaucidium gnoma swarthi*): Provincially Blue-listed

There are three species of the seven owl species recognized in North America that breed in BC. The *swarthi* subspecies is endemic to Vancouver Island and adjacent islands. These owls are crepuscular, feeding on small mammals, reptiles, amphibians, a variety of bird species and invertebrates using a perch and pounce hunting method. They forage along roads through forested areas, openings within continuous forest, open stands, riparian corridors and open habitats along lakeshores and higher elevations. Forage sites include shrub, pole sapling, young, mature or old forest seral stages. This obligate secondary cavity nester is dependent on woodpecker or natural cavities in coniferous trees. Nesting sites include young forest with suitable wildlife trees, mature forest or old forest sites. (*Cooper and Beauchesne, 2004*). The intact young forest with scattered mature trees and stands of wildlife trees may provide nesting habitat for this species. Forage is expected to be available within the site.

Townsend's Big-eared Bat (*Corynorhinus townsendii):* Provincially Blue-listed

In Canada, it is restricted to British Columbia. On the coast, it inhabits Vancouver Island, the Gulf Islands and the Vancouver area. In British Columbia this species is associated with a variety of habitats from coastal forests to arid grasslands of the interior. Its elevational range in the province is from sea level to 1070 metres, although most occurrences are from low elevations. Although it is widespread across most of southern British Columbia, this bat is particularly vulnerable to human activity. Disturbing females with young will affect breeding success, and repeated disturbance at winter hibernacula will increase winter mortality. Females form colonies of a dozen to several hundred in dimly lit areas in buildings, caves or mines. This is one of the few bats that have been consistently found hibernating in British Columbia. The only nursery colony found in British Columbia was in the attic of a house on Vancouver Island; it consisted of about 60 females and their young. A late flyer, Townsend's Big-eared Bat emerges an hour or so after dark. It is an agile bat that is capable of flying at slow speeds *(BC CDC).* The parcel has an intact forest stand with a number of large diameter trees, standing dead trees, a forest edge next to an open grassy area, and bat boxes. It is expected that the property may provide foraging and roosting habitat for these bats.

Western Screech Owl, *kennicotti* subspecies (*Megascops kennicottii kennicottii*): Provincially Blue-listed

This owl species occurs at lower elevations within moist, coniferous and mixed forests and riparian woodlands. Often, they are associated with bigleaf maple or black cottonwood in riparian areas. They nest in natural tree cavities or abandoned woodpecker holes. This species is a generalist predator, feeding on small mammals (mice and shrews), insects and small birds but also fish, frogs and slugs (*BC CDC*). The intact forest with standing dead trees within the study area may provide suitable habitat for this secondary cavity nester.

White-lip Rein Orchid: Provincially Blue-listed

A perennial herb from tubers. Grows 20-55cm tall with terminal flower spike of small white flowers, sometimes faintly green, and an unpleasant scent. Found in dry forests and forest margins in the lowland to montane zones, north to Alaska and south to California; rare in coastal BC. (*E-flora*). Little information is available about this species. The dry forest ecosystem found within the site may provide suitable habitat for this orchid.

4.3 Land Use

4.3.1 Current Land Use

The parcel is developed for recreational use with three cottages and some ancillary buildings but is mainly forested. A long driveway off Stalker Road extends into the parcel to a clearing at the eastern end of the property, splitting into three driveways to access the cottages. The parcel is serviced by septic and well water. Ancillary buildings include a well pumphouse, shed, and two small cabins (bunkies). An overhead utility line extends diagonally (southwest to northeast) across the parcel with a connection extending from the centre of the parcel north into the neighboring parcel.

As understood, three families bought the property in 1970. The parcel has remained owned by the original three families and is used recreationally by multiple generations. No development has been proposed.

4.3.2 Archaeological Chance Finds

A detailed archaeological assessment and report have been completed by Baseline Archaeology. Aquaparian observed that there is a shell midden along the sand and gravel shoreline. Gabriola Island is part of the traditional territory of the Snuneymuxw First Nation and the lands remain unceded (*GaLTT*). Other First Nations also made seasonal use of Gabriola

and its resources and have overlapping claims (*GaLTT*). Archaeological sites, both recorded and unrecorded are protected under the *Heritage Conservation Act*. As understood, no development is proposed. If an archaeological find is encountered during any future development the BC Archaeological Branch contacted at 250-953-3334 for directions.

5.0 SUMMARY

The subject parcel is currently used recreationally by three families that purchased the property in the 1970s. The proposed rezoning is intended to allow for subdivision of the property to create three strata lot parcels for each family to own including Common Property and Park Dedication. No Development Permit Areas apply to the parcel. The parcel is predominantly forested and has been partially cleared at the east side for recreational development, but no further development is proposed. The site has a uniform, selectively logged, second growth forest canopy over most of it, with scattered mature (80+ years) Douglas fir, arbutus and Garry oak. The open area near the shoreline to the east was likely once Terrestrial Herbaceous meadow but is now lawn/yard with scattered clusters of Garry oak, arbutus and Douglas fir. Sensitive meadow habitat is preserved in Drumbeg Park to the south. There is a large patch of Himalayan blackberry and Scotch broom to the southeast

Several species of migratory birds were identified during the site visit and it is expected that a wide diversity of songbirds would make use of the layered canopy within the site as nesting habitat and forage on cones and berries throughout the property. No eagle or heron nests were identified within the property though there appears to be suitable nesting habitat for small and large raptor species. Standing dead trees and snags are expected to provide cavity nesting habitat for woodpeckers and secondary cavity nesting species as well as bat roosting habitat. A variety of small mammal species are expected to utilize the intact forest habitat and river otter and marine mammals are seen in the nearshore marine waters fronting the parcel. Reptile species are likely to be found in the open cleared area, but amphibian habitat is limited due to dry, thin soils and no freshwater habitat. The parcel also has features that may potentially support a number of species-at-risk.

No watercourses or wetlands were identified within the parcel. Ground conditions include dry, thin soils over sandstone bedrock with no springs, seeps or vernal pools observed. Marine shoreline habitat dominates the east side of the parcel. Shell middens were observed along the eroding shoreline soils.

This Biophysical Assessment has been completed using the Islands Trust Baseline Inventory Report Standard as a guideline. The assessment includes an inventory of physical and

biological features of the parcel to provide a baseline environmental overview and to identify any sensitive attributes associated with the property. This report is intended to support a rezoning application to the Islands Trust.

6.0 ENVIRONMENTAL PROTECTION RECOMMENDATIONS

At the time of writing this assessment report no development is proposed. The following general environmental protection measures are provided for planning purposes for any future development of this property. Additional measures may be warranted depending on finalized development plans and construction timing:

- Vegetation clearing is to be completed outside the migratory songbird nesting season for the area (March 15th – August 15th). Clearing proposed within this time frame requires one or more pre-clearing nest surveys by a suitably qualified Biologist to avoid damage or disturbance to breeding birds. Clearing during the peak season is not recommended (April 15 – July 15) because spotting small songbird nests or discrete nesting behaviour would be difficult in the site's high, multi-layered canopy.

- Trees with pileated woodpecker nest cavities are protected under the Migratory Bird Regulation (2022) for 36 months after being confirmed inactive. If clearing of trees with potential pileated woodpecker nest cavities is proposed, retain a qualified Biologist to confirm before removal.

- Archaeological consultation may be warranted for ground disturbance based on evidence of shell middens exposed along the shoreline. Baseline Archaeological has completed an archaeological assessment and should be consulted at the development planning stage. Archaeological sites, both recorded and unrecorded are protected under the *Heritage Conservation Act*. If an archaeological find is encountered during construction, activities must be halted, and the BC Archaeological Branch contacted at 250-953-3334 for directions.

- No sediment-laden water is to be discharged into the marine environment. Sediment and erosion measures are to be implemented as necessary to protect the marine environment depending on weather conditions and construction method.

- No deleterious substances (oils, grease, gasoline, diesel, etc.) are to be allowed to enter the marine environment.

- On-site machinery should be power washed and free of leaks before entering the site. All heavy equipment used on-site should be inspected daily and have a proper spill kit on board in case of any leakage or spills of hydrocarbons.

- All fill brought to the site is to be clean i.e. free of hazardous contaminants and free of invasive weeds or seeds. And,

- Removal of Scotch broom and Himalayan blackberry and restoration with native Garry oak ecosystem species is recommended to strengthen the ecology of the site. This work could take multiple seasons to complete and would be considered an ongoing project. The patch of invasive plants is located adjacent to restoration efforts in Drumbeg Provincial Park to the south. Additional clusters of Scotch broom are found along the edge of cleared forest (e.g. around the edge of the clearing for the middle cottage) The following recommendations for eradication of these invasives is based on the *Invasive Species Council of BC: Himalayan Blackberry Factsheet & Scotch Broom Tips*:

  1. **Himalayan blackberry**
  - Plan for blackberry removal in late August/September when the plants are stressed and when the migratory bird nesting season (March 15-August 15) is over;
  - Removal is only successful if all parts of the plant are removed. This includes canes, roots and root crowns;
  - Cut canes down to ~30cm before digging/grubbing to remove thickets while easily locating root crowns;
  - Hand pulling is recommended for small seedlings or young plants or shade-supressed canes. Pull when plants are large enough to grasp but have not produced seeds.
  - Dig/grub more established plants, avoid leaving root fragments behind as they may resprout. Claw mattocks or Pulaskis have been proven to be effective tools;
  - If machines will be used, dig deep and carefully to get all of the root crown; and,
  - Bag or tarp all plant parts and seeds before transporting to a designated disposal facility such as a landfill or destroy by incineration.

  2. **Scotch broom**
  - Minimize soil disturbance adjacent to infestations to contain seed spread;
  - Cut plants below soil before flowering and seeds set (late winter, early spring),
  - Smaller plants (<1.5cm) can be hand pulled in late spring when plant is using energy for flower production, but hand pulling may encourage growth due to soil disturbance;

- Due to enormous seed banking and regenerating, mechanical control needs to be repeated over a 3-5 yr period;
- Burning is ineffective as seeds germinate following a burn;
- After mechanical treatment, promptly re-vegetate with an appropriate seed mix (e.g. Garry Oak Ecosystem seed blend from Satinflower Nurseries), followed by an application of phosphorus-rich fertilizer and wood mulch;
- Promptly establish competitive shrubbery, including snowberry, thimbleberry, and dull Oregon-grape to reduce broom growth, or, restore with Garry oak meadow species. Contact GaLTT for advice on what species and restoration methods they are using in Drumbeg Provincial Park.

7.0 CLOSURE

Aquaparian Environmental Consulting Ltd (Aquaparian) was retained to complete a Biophysical Assessment (BA) of 1900 Stalker Road on Gabriola Island BC to support a rezoning application to the Islands Trust and future subdivision. This report was completed to identify general habitat conditions and features within the study area. No detailed species presence assessments were completed for this study.

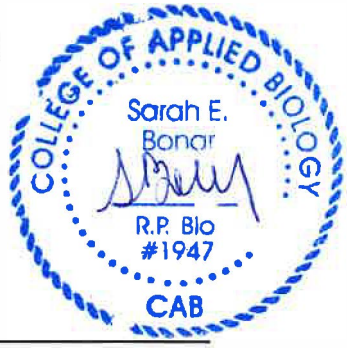
This report has been completed in accordance with generally accepted biological practices. No other warranty is made, either expressed or implied. Aquaparian trusts that the information provided in this report meets your requirements. Any questions regarding information provided in this document, please contact the undersigned at (250) 591-2258.

Respectfully submitted,
AQUAPARIAN ENVIRONMENTAL CONSULTING LTD.

PREPARED BY:

Jeni Rowell, B.Sc.
Biologist-in-Training

REVIEWED BY:



Sarah Bonar, R.P.Bio.
Senior Biologist/Principal

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ENVIRONMENTAL CONSULTING
203- 321 Wallace Street, Nanaimo, BC V9R 5B6
SARAH BONAR 250-714-8446 CHRIS ZAMORA 250-714-8864

8.0 REFERENCES

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FIGURE 1A & 1B

SITE LOCATION MAP

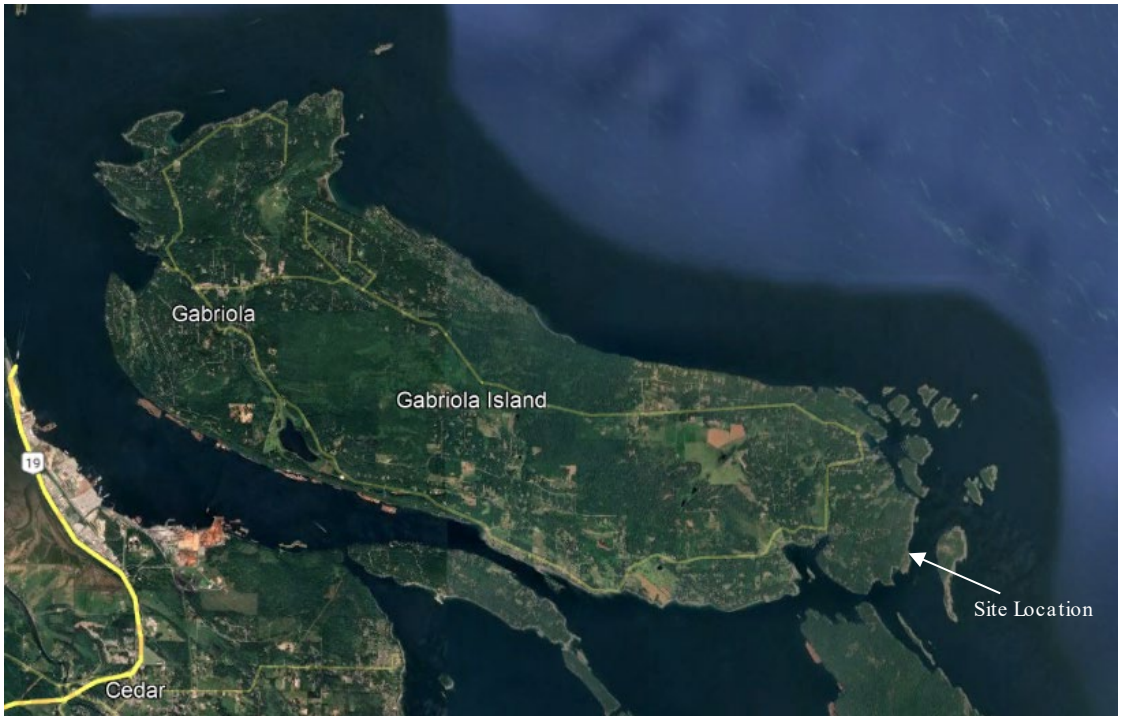
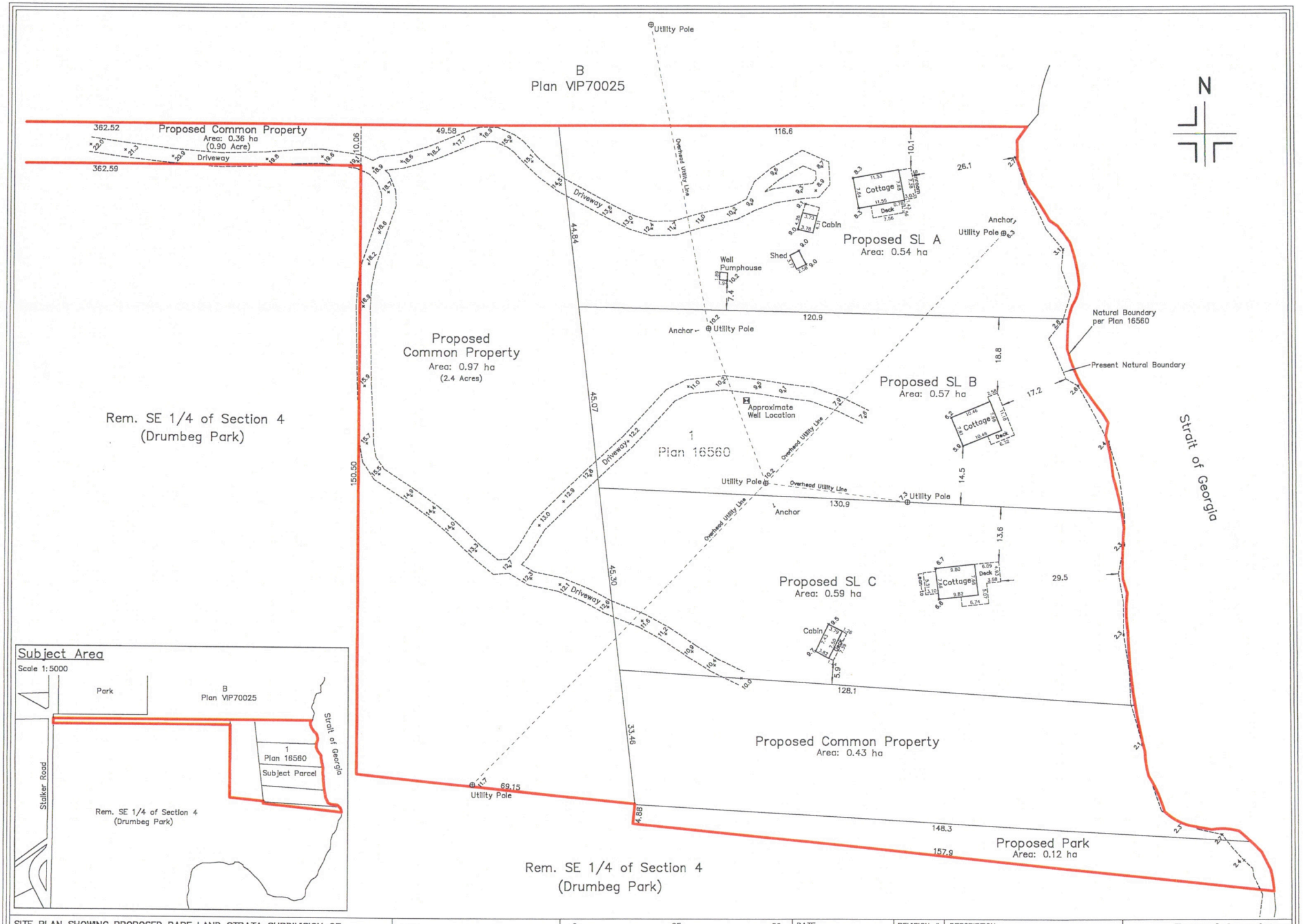


Figure 1a – Site Location Map

Figure 1b – Parcel Map

FIGURE 2

SITE PLAN
(TURNER & ASSOCIATES)



SITE PLAN SHOWING PROPOSED BARE LAND STRATA SUBDIVISION OF:
LOT 1, SECTION 4, GABRIOLA ISLAND,
NANAIMO DISTRICT, PLAN 16560.

Client: GEOFFREY LITHERLAND			Civic Address: 1900 STALKER ROAD	
File: 18-045	Scale: 1:600	Drawn by: DRW	Date: October 12, 2023	Existing Zoning: Resource (R)

NOTE:
THIS PROPERTY IS AFFECTED BY THE FOLLOWING REGISTERED DOCUMENTS:
UNDERSURFACE RIGHTS M76301,
SRW ES25205 & ES25206.

0 25 50
SCALE 1:600
DISTANCES AND ELEVATIONS SHOWN ARE IN METRES.
GEODETIC ELEVATIONS ARE DERIVED FROM GNSS OBSERVATIONS (CVD28BC DATUM).

DATE	REVISION #	DESCRIPTION
March 12, 2020	First Issue	
October 12, 2023	1	REVISE LOT LAYOUT

Turner & Associates
land surveying™
250.753.9778
435 Terminal Avenue North
Nanaimo, BC V9S 4J8
www.turnersurveys.ca

FIGURE 3

ECOSYSTEM POLYGON MAP

FIGURE 3 – ECOSYSTEM POLYGON MAP

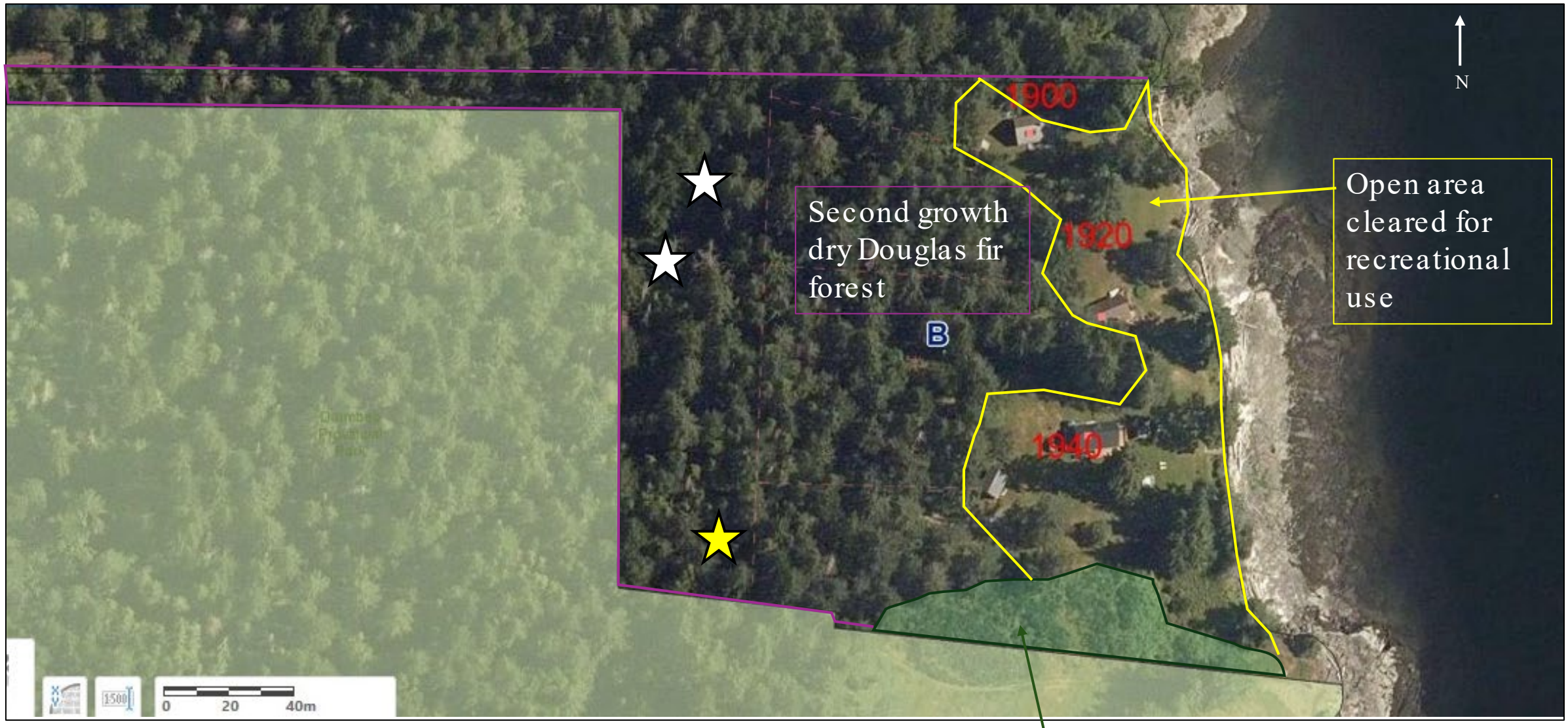


FIGURE 4

**GABRIOLA ISLAND SENSITIVE ECOSYSTEM MAPPING AIRPHOTO – 2007
(ISLANDS TRUST & PROVINCE OF BRITISH COLUMBIA)**

Sensitive and Terrestrial Ecosystems Label

50001 CDFmm 5YF DS 5 5WN:sp RP 4	**50002** CDFmm 7NA RW 0 2NA DS 4 1HB:cs FC 2	**50006** CDFmm 10HB:ro RO 1	**50007** CDFmm 6YF DS 5 2NA RW 0 2HB:ro RO 1	**50010** CDFmm 8FS CF 2 2WN:sp RP 4	**50011** CDFmm 10MF:co DS 6	**50013** CDFmm 8NA RW 0 2HB:ro RO 1
50014 CDFmm 5NA RW 0 4YF DS 5 1HB:ro RO 1	**50015** CDFmm 10MF:co DS 6	**50018** CDFmm 10HB:ro RO 1	**50019** CDFmm 10HB:ro RO 1	**50021** CDFmm 6YF DS 5 2WD:co DA 5 2NA RW 0	**50022*** CDFmm 10WN:sp RP 5	**50024** CDFmm 8WN:sp RV 5 2WN:sp RP 5
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50055 CDFmm 7YF DS 5 2YF DS 5 1WD:co DA 3	**50056*** CDFmm 7YF DS 5 2NA RW 0 1WD:co DA 5	**50057** CDFmm 4WN:fn Wf51 2 4HB:du LM 2 2WN:sp RP 3	**50066** CDFmm 8MF:co DS 6 2NA RW 0	**50069** CDFmm 10MF:mx RF 6	**50070*** CDFmm 7MF:mx DS 6 3MF:mx RF 6	**50071** CDFmm 6MF:co DS 6 2NA RW 0 2NA DS 3
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50389 CDFmm 10WN:sp RV 5	**50391** CDFmm 10WN:sp RP 5	**50392** CDFmm 10WN:sp RV 5	**50393** CDFmm 10WN:sp RP 5	**50395** CDFmm 7WN:sp RV 5 3YF DS 5	**50396** CDFmm 6NA DS 4 3MF:co DS 6 1WN:sp RV 4	**50398** CDFmm 8HB:ro RO 1 2NA RW 0
50400 CDFmm 5WD:co DA 3 5NA DS 3	**50403** CDFmm 10WN:sp RV 5	**50404** CDFmm 8FS CF 2 2WN:sp RP 3	**50408** CDFmm 8WN:sp RV 5 2WN:sp RP 5	**50409** CDFmm 8FS CF 2 1WN:sp RV 3 1NA RW 0	**50410** CDFmm 8YF DS 5 1WN:sp RP 4 1NA RW 0	**50411** CDFmm 7NA DS 3 3WN:sp RV 3
50413 CDFmm 7WD:co DA 5 3HB:ro RO 1	**50415** CDFmm 7NA DS 3 3WN:sp RV 4	**50417** CDFmm 6YF DS 5 2WN:sp RV 5 2WD:co DO 5	**50422** CDFmm 10WN:sp RV 5	**50425** CDFmm 10WD:co DA 5	**50426** CDFmm 5NA DS 3 3NA DS 4 2WD:co DO 3	**50427** CDFmm 8NA RW 0 2HB:ro RO 1
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50511 CDFmm 10WN:sp RP 5	**50534** CDFmm 7CL:cc CL 1 3WD:co DA 5	**50540** CDFmm 8YF DS 5 2WD:co DA 5	**50555** CDFmm 9WD:co DA 5 1NA RW 0	**50560** CDFmm 10WD:co DA 5	**50568** CDFmm 10WD:co DA 5	**50570** CDFmm 6WD:co DA 5 4HB:hb SC 1
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51198 CDFmm 10HB:ro RO 1	**51199** CDFmm 10HB:ro RO 1	**51200** CDFmm 10HB:ro RO 1	**51201** CDFmm 10HB:ro RO 1	**51202** CDFmm 10HB:ro RO 1	**51203** CDFmm 10HB:ro RO 1	**51204** CDFmm 10HB:ro RO 1
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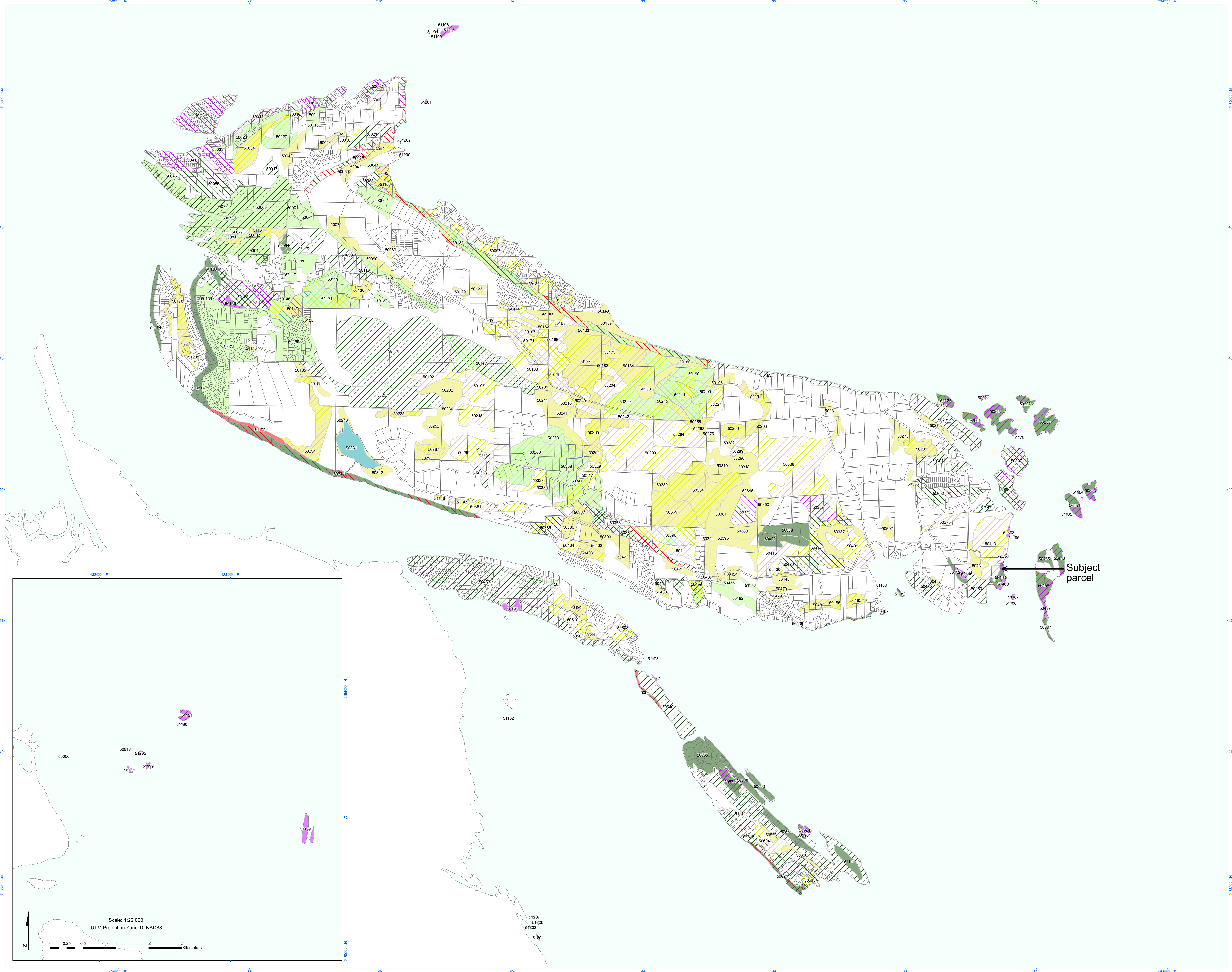

What is a Sensitive Ecosystem?

For the purpose of this study, an *ecosystem* is considered to be a portion of the landscape with relatively uniform dominant vegetation.

Sensitive ecosystems are those which are fragile and/or rare, or those ecosystems which are ecologically important because of the diversity of species they support.

Rationale

Intense development pressure fueled by population and economic growth has fragmented and degraded many terrestrial ecosystems. A high proportion of these ecosystems are now designated as 'at risk' in BC. Sensitive ecosystems typically have high biological diversity and are a vital part of the landscape. They provide ecosystem services for a healthy economy and for social well being. They regulate climate, clean water, generate and clean soils, recycle nutrients and pollinate our crops. To protect these areas, sensitive ecosystems must be located, identified and mapped. From 1993 to 1999 the Provincial and Federal Governments completed a Sensitive Ecosystems Inventory of East Vancouver Island and the Gulf Islands. This mapping product is an updated version of that product.

Purpose

The purpose of this Sensitive Ecosystems map is to identify the location of sensitive ecosystems. The goal of this mapping exercise is to encourage informed land use decisions that will conserve sensitive ecosystems. This map and the accompanying data provide site-specific ecological information that can be used to flag sites of conservation concern, to promote land stewardship and to prompt detailed field surveys and consideration of ecological values before changes to the land are initiated.

Methodology

Mapping methods are based on the Resource Information Standards Committee (RISC) Standard for Terrestrial Ecosystem Mapping (TEM) in BC. This Sensitive Ecosystems map was themed from TEM data using the RISC Standard for Mapping Ecosystems at Risk in BC. Field survey protocols followed Describing Terrestrial Ecosystems in the Field (RISC 1998).

Data Limitations

The Sensitive Ecosystems map is a tool to alert decision makers to the existence of sensitive ecosystems. However, **when land-use changes are proposed, detailed on-the-ground site assessments are necessary**. For sites that were not field checked, the accuracy of the data depends heavily on the expertise, local knowledge, and professional judgment of the mapper and the quality and quantity of available source data. Because the area is changing rapidly, reference to the data set(s) used as the information source is advised.

Due to the mapping scale of the aerial photographs, the minimum polygon size is generally ½ hectare. Enlargement of the data beyond the source scale may result in unacceptable distortion and faulty registration with other data sets.

What can be done to protect the sensitive ecosystems?

Direct and indirect impacts to these ecosystems can be avoided by:

- Retaining or creating vegetated buffers around sensitive ecosystems to isolate them from outside disturbances;
- Controlling land and water access to fragile ecosystems;
- Controlling invasive species;
- Allowing natural disturbances to occur;
- Maintaining water quality

If development must occur, develop carefully!

Conduct an ecological inventory to identify the existing flora and fauna and to locate any threatened or endangered plant and animal species, plant communities, and habitat features needing protection.

Plan and implement all development activities in a manner that will not adversely affect or disturb the sensitive ecosystem. Consult a qualified professional to interpret the ecological inventory data and work to incorporate designs that maintain the functions and values of the natural ecosystem.

Acknowledgements:

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Kate Emmings – Islands Trust Fund
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Kate Emmings – Islands Trust Fund
Corey Erwin - BC Ministry of Environment
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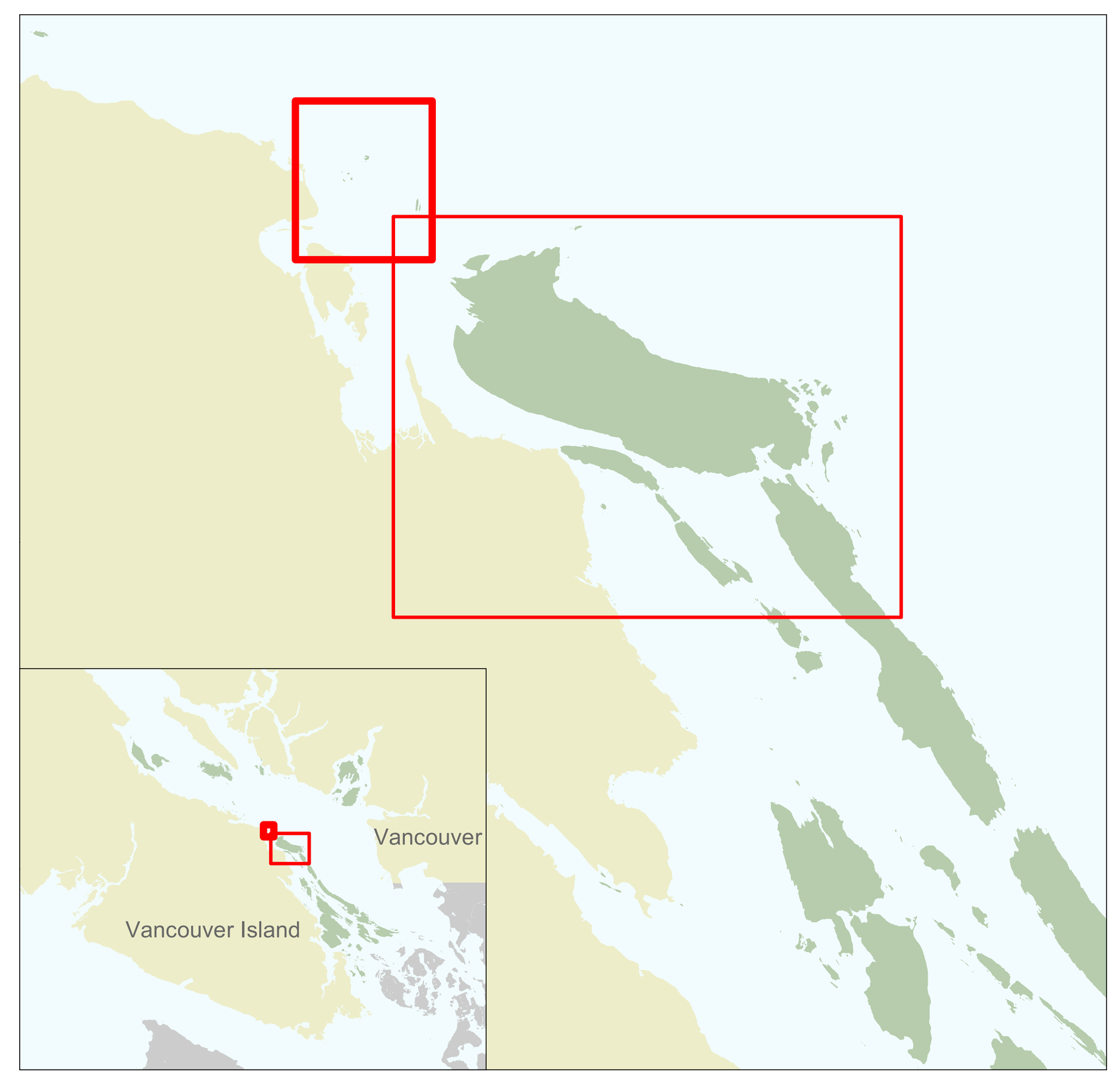
Mark van Bakel - Islands Trust



Sensitive and Terrestrial Ecosystems Label

Polygon Number
Biogeoclimatic Unit
7838* ← * Indicates a field sample
CWHxm1
% of polygon (as decile) →
6WD:mx AM 5 ← Primary Ecosystem
2WD:co DC 4 ← Secondary Ecosystem
2WD:co DC 5 ← Tertiary Ecosystem
SE Class, SE Subclass, Mapcode, Structural Stage

The example label above indicates the SEM and TEM attributes mapped for polygon 7838. The polygon occurs in the Coast Western Hemlock Eastern Very Dry Maritime variant; 60% of the polygon is WD:mx - Woodland: mixed conifer and broadleaf (Primary Ecosystem), map code AM - Arbutus - Hairy manzanita, structural stage 5. The remaining 40% of the polygon is WD:co - Woodland: conifer dominated, map code DC - Douglas-fir - Western hemlock – Cladina (Secondary and Tertiary Ecosystems). Of this 40%, 20% is structural stage 4 and 20% is structural stage 5.

Structural Stage & Biogeoclimatic Units

Structural Stage	Description
0	No Structural Stage (usually rock or open water)
1	Sparse/bryoid
2	Herb
3	Shrub/Herb
4	Pole/Sapling
5	Young Forest
6	Mature Forest
7	Old Forest
Biogeoclimatic Units	**Description**
CDFmm	Coastal Douglas-fir Moist Maritime Subzone

Terrestrial Ecosystem Map Codes and Site Unit Names

Map Code	Site Unit Name	Map Code	Site Unit Name	Map Code	Site Unit Name	Map Code	Site Unit Name
CDFmm - Forested		CDFmm - Non-Forested		CDFmm - Non-Forested		Anthropogenic	
AS	Aspen - Slough sedge	Ed01	Tufted hairgrass - Meadow barley estuarine meadow	Wf51	Sitka sedge - Peat moss fen	RE	Reservoir
CS	Western redcedar - Slough sedge	Em02	Glasswort - Sea-milkwort estuarine marsh	Wf52	Sweet gale - Sitka sedge fen	RW	Rural residential
CW	Black cottonwood - willow	Em03	Seashore saltgrass	Wf53	Slender sedge - White beak-rush fen	RZ	Road surface
DA	Douglas-fir - Shore Pine - Arbutus	Em05	Lyngbye's sedge estuarine marsh	Wm05	Cattail marsh	UR	Urban
DG	Douglas-fir - Grand Fir - Oregon Grape	FC	Fescue - Camas	Wm50	Sitka sedge - Hemlock-parsely marsh	Map Code	Site Unit Name
DO	Douglas-fir - Oniongrass	HL	Hardhack - Labrador tea	Ws50	Pink spirea - Sitka sedge swamp	Sparsely Vegetated	
DS	Douglas-fir - Salal	LM	Dunegrass - Beach pea	Ws51	Sitka willow - Pacific willow - Skunk cabbage swamp	BE	Beach
GO	Garry oak - Oceanspray	OM	Garry oak - moss	Map Code	Site Unit Name	CL	Cliff
LS	Shore pine - Sphagnum	OR	Oceanspray - rose	Anthropogenic		LA	Lake
RC	Western redcedar - Skunk cabbage	QB	Garry oak - Brome (or mixed grasses)	CF	Cultivated field	MU	Mudflat
RF	Western redcedar - Grand fir - Foamflower	RA	Nootka rose - Pacific crab apple	CO	Cultivated orchard	OW	Open water (< 2m deep)
RK	Western redcedar - Douglas-fir - Oregon beaked moss	SC	Cladina - Wallace's selaginella	ES	Exposed soil	PD	Pond (> 2m deep)
RP	Western redcedar - Indian-plum	SL	Sedge - Western lilaeopsis	GC	Golf course	RI	River
RS	Western redcedar - Snowberry	SS	Spirea - Sedge wetland	GP	Gravel pit	RO	Rock outcrop
RV	Western redcedar - Vanilla-leaf	Wb50	Labrador tea - Bog laurel - Peat-moss bog	IN	Industrial		

Islands Trust
British Columbia

Gabriola Island Sensitive Ecosystem Mapping Airphoto - 2007

Scale: 1:22,000
UTM Projection Zone 10 NAD83
0 0.25 0.5 1 1.5 2 Kilometers

Sensitive Ecosystems

Sensitive ecosystems are fragile and/or rare, or are ecologically important because of the diversity of species they support.

Old Forest (OF): Primary Ecosystem / Secondary / Tertiary

Definition: Conifer-dominated dry to moist forest types, structural stage 7, generally >250yrs.

Importance: Due to the lack of disturbance, old forest ecosystems are often associated with rich communities of plants and animals that may be dependent upon the unique environmental conditions created by these forests.

Subclasses:
co (conifer-dominated) - greater than 75% coniferous species
mx (mixed conifer and deciduous) - forests dominated with a mixture of coniferous and broadleaf trees (<75% coniferous and >25% broadleaf)

Woodland (WD): Primary Ecosystem / Secondary / Tertiary

Definition: Dry open forests, generally between 10 and 30% tree cover, can be conifer-dominated or mixed conifer and arbutus stands; because of open canopy, will include non-forested openings, often with shallow soils and bedrock outcroppings.

Importance: Woodlands are nationally, provincially and regionally rare and highly fragmented . A rich assemblage of plants, insects, reptiles and birds are drawn to these ecosystems due to the food sources, habitat and proximity to the ocean. Garry oak woodlands, for example support the highest plant species diversity of any terrestrial ecosystem in British Columbia and are especially vulnerable to rural development.

Subclasses:
bd (broadleaf) - dominant broadleaf with <15% coniferous species
mx (mixed conifer and deciduous) - mixed conifer and broadleaf with a minimum of 25% cover of either group is included in the total tree cover

Herbaceous (HB): Primary Ecosystem / Secondary / Tertiary

Definition: Non-forested ecosystems (less than 10% tree cover), generally with shallow soils. They include bedrock outcroppings, large openings within forested areas, spits, dunes and shorelines vegetetated with grasses and herbs.

Importance: Terrestrial Herbaceous ecosystems are characterized by thin soils which are easily disturbed. Herbaceous plants can be easily trampled or dislodged onto bare rock where they cannot re-establish. Thus they are highly vulnerable to a range of human disturbance factors including residential development and various recreational uses.

Subclasses:
hb (herbaceous) - non-forested, less than 10% tree cover, generally shallow soils, often with exposed bedrock, predominantly a mix of grasses and forbs, also lichens and mosses
cs (coastal herbaceous) - rocky shoreline or islet, influenced by the marine environment and characterized by less than 20% vegetation cover of grasses herbs, mosses and lichens.
sp (spit) - finger-like extension of beach, comprised of sand or gravel deposited by longshore drifting; low to moderate cover of salt-tolerant grasses and herbs
du (dunes) - ridge or hill, or beach area created by windblown sand; may be more or less vegetated depending on depositional activity, beach dunes will have low cover of salt-tolerant grasses and herbs
sh (shrub) - >20% of total vegetation cover is shrub cover, with grasses and herbs
ro (rock) - rock outcrops not dominated by shrubs

Wetland (WN): Primary Ecosystem / Secondary / Tertiary

Definition: Areas that are saturated or inundated with water for long enough periods of time to develop vegetation and biological activity adapted to wet environments. This may result from flooding, fluctuating water tables, tidal influences or poor drainage conditions.

Importance: Wetland ecosystems are sensitive and important because they exhibit rarity, high biodiversity, fragility, specialized habitat, specialized functions and connectivity.

Subclasses:
bg (bog) - nutrient poor wetland, on organic soils (sphagnum peat), water source predominantly from precipitation; may be treed or shrub dominated
fn (fen) - nutrient medium wetland (sedge peat) where ground water inflow is the dominant water source, open water channels common; dominated by sedges, grasses and mosses
ms (marsh) - wetland with fluctuating water table, often with shallow surface water, usually organically enriched mineral soils; dominated by rushes, reeds, grasses and sedges
sp (swamp) - poor to very rich wetland on mineral soils or with an organic layer over mineral soil, with gently flowing or seasonally flooding water table; woody vegetation
sw (shallow water) - standing or flowing water less than 2m deep, transition between deep water bodies and other wetland ecosystems (i.e. bogs, swamps, fens, etc.); often with vegetation rooted below the water surface
wm (wet meadow) - periodically saturated but not inundated with water, organically enriched mineral soils; grasses, sedges, rushes and forbs dominate

Cliff (CL): Primary Ecosystem / Secondary / Tertiary

Definition: Very steep slope, often exposed bedrock, may include steep-sided sand bluffs.

Importance: Open ledges and horizontal fissures on cliffs are known to provide nesting sites. Cliff crevices are used for roosting bats while deep crevices are used for shelter and overwintering of snakes and lizards.

Subclasses:
cc (coastal cliffs) - cliffs with a marine influence, generally near vertical bedrock with accumulation of soil limited to fissures and ledges.
ic (inland cliffs) - inland cliffs: typically formed as a result of erosion, catastrophic failures or mass wastage. Generally characterized by rapid drainage and the accumulation of soil that is limited to bedrock fissures and ledges

Freshwater (FW): Primary Ecosystem / Secondary / Tertiary

Definition: Freshwater ecosystem includes bodies of water such as lakes and ponds that usually lack floating vegetation.
Importance: Freshwater ecosystems are home to numerous organisms such as, fish, amphibians, aquatic plants, and invertebrates.
Subclasses: Lakes and ponds play a vital role in the lifecycle of many species.
la (lake) - a naturally occurring static body of water, greater than 2m deep in some portion.
pd (pond) - a small body of water greater than 2m deep, but not large enough to be classified as a lake

Rare Ecosystems

Other important ecosystems have high biodiversity values.

Mature Forest (MF): Primary Ecosystem / Secondary / Tertiary

Definition: Usually conifer-dominated, occasionally deciduous, dry to moist forest types, structural stage 6, generally >80yrs.

Importance: ***Future older forests*** Within 20 years, many Mature Forests that were logged early this century will become Older Forests. The biodiversity values of Mature Forests generally become higher with age. This means it will be able to sustain more and larger species of plants and animals.
Landscape connectivity Mature Forest stands provide connections between other natural areas that promote the movement and dispersal of many forest-dwelling species across the landscape.
Buffers Mature Forest can minimize disturbance to sensitive ecosystems that occur within or adjacent to the forest patch. Where they border or surround wetlands, patches of older forest or other sensitive ecosystems, the Mature Forest area serves an important role in buffering the adjacent sensitive areas.

Subclasses:
co (conifer dominated) - greater than 75% coniferous species
mx (mixed conifer and deciduous) - a minimum of 25% cover of either group is included in the total tree cover
bd (broadleaf) - greater than 75% broadleaf species

Other Mapped Ecosystems

Young Forest (YF):

Definition: Limited to areas of young forest dispersed amongst sensitive and important ecosystems. Forest is 40 - 80 yrs old depending on species and ecological conditions; canopy has begun to differentiate.

Seasonally Flooded Agricultural Fields (FS):

Definition: Limited to areas of annually flooded cultivated fields or hay fields dispersed amongst sensitive and important ecosystems.

Non-Sensitive (NA):

Definition: Limited to areas of disturbance or human impact dispersed amongst sensitive and important ecosystems.

Ecosystem Map Symbols

Ecosystem composition is complex and often contains a dominant ecosystem with secondary and tertiary ecosystems. In this map the dominant ecosystem has a solid shading and the secondary and tertiary ecosystems are identified by cross-hatched lines.

Example of a primary sensitive Woodland ecosystem with a secondary sensitive Herbaceous ecosystem

Occassionally sensitive ecosystems will mix with non-sensitive ecosystems. In this map a sensitive ecosystems mixed with non-sensitive is identified by cross-hatched lines with solid white shading.

Example of a secondary sensitive Herbaceous and tertiary sensitive Woodland ecosystems mixed with a non-sensitive primary ecosystem

Sensitive ecosystems can also mix with important ecosystems. In this map a sensitive ecosystem mixed with an important ecosystem is identified by cross-hatched lines with solid green shading.

Example of a tertiary sensitive Herbaceous ecosystem mixed with a primary important Mature Forest ecosystem

FIGURE 5

MAPIT SENSITIVE ECOSYSTEM MAPS (ISLANDS TRUST)

FIGURE 5 – ISLANDS TRUST SENSITIVE ECOSYSTEM MAPS

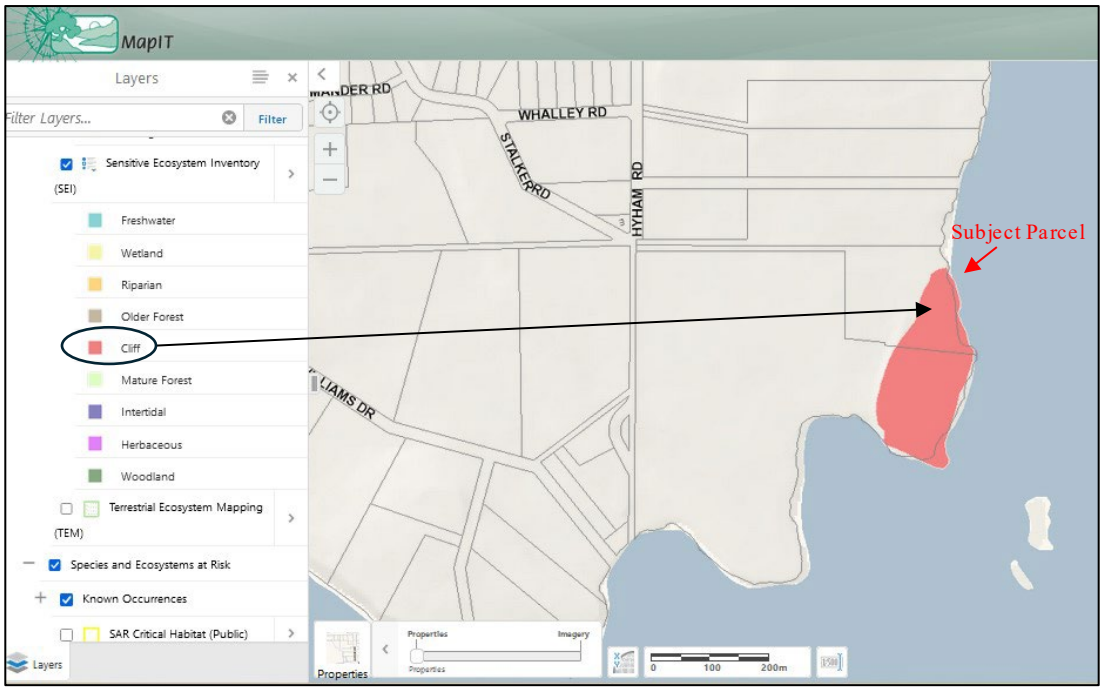


Figure 5a – Islands Trust "MapIT" SEI Mapping Layer

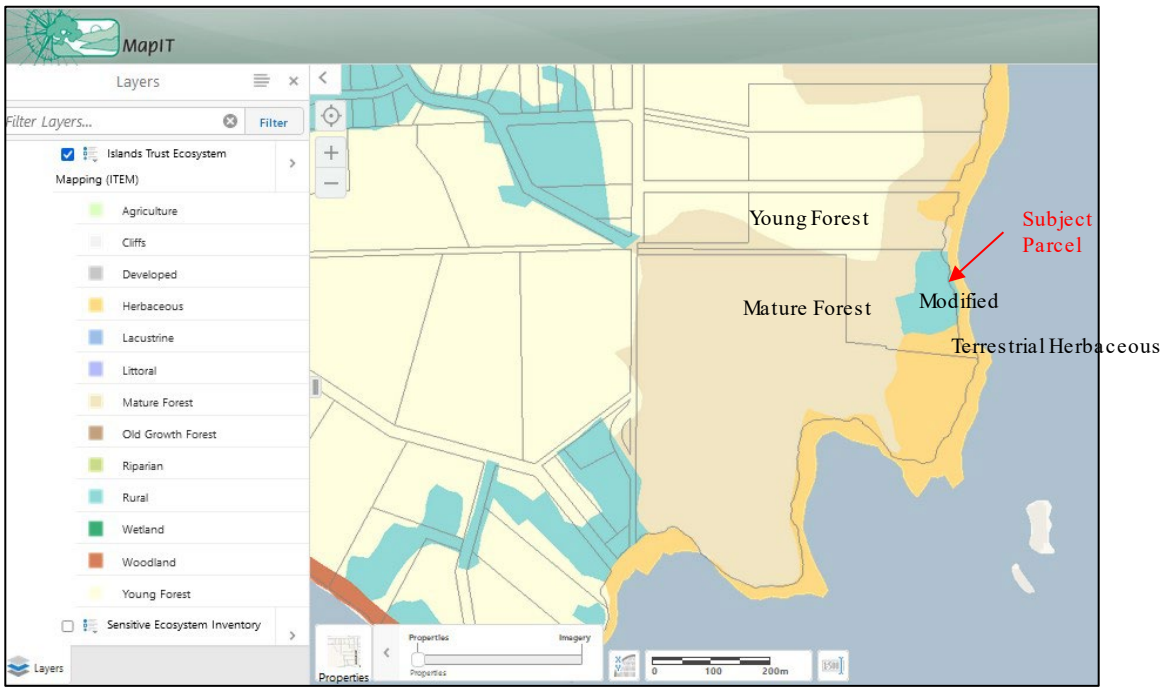


Figure 5b – Islands Trust "MapIT" ITEM Mapping Layer

APPENDIX A

SITE PHOTOGRAPHS

APPENDIX A – SITE PHOTOGRAPHS

Photo 1: Some low spots have a moist soil regime at west side of panhandle supporting bigleaf maple and western redcedar. No wetland habitat.

Photo 2: Looking east up driveway along panhandle section.

Photo 3: Looking southeast into the larger part of the parcel from base of panhandle where driveway splits to access cottages.

Photos 4-6: Typical forest composition, dry 2nd growth Douglas fir forest with scattered mature trees. Flat, open understory. Minimal downed wood.

Photo 7: Stand of snags with woodpecker cavities.

Photo 8: One large fir with fire scars and a “Wildlife Tree” sign. May have once been an eagle nest tree; corresponds with old WiTS mapping.

Photo 9: Fir had one smaller stick nest not characteristic of an eagle. Likely a smaller hawk spp. or corvid spp.

Photo 10: Firth (north) cottage looking southeast towards ocean.

Photo 11: North end of shoreline looking northeast. Low bedrock slope with large arbutus and sandstone intertidal.

Photo 12: Second (middle) cottage, cabin & lawn; facing southwest.

Photo 13: Third (south) cottage, patio & lawn; facing southwest.

Photo 14: Looking northwest along shoreline from south side of parcel. Note sandstone bedrock with small gravel and/or sand pocket beaches.

Photo 15: Shoreline has eroding shell midden.

Photo 16: Thickets of Scotch broom and Himalayan blackberry in southeast corner of the parcel.

Photo 17 & 18: Restoration project in the adjacent Drumbeg Provincial Park to replace invasive species with Garry oak ecosystem. Shows a restoration plot adjacent to subject parcel boundary looking north.

Photo 19: Example of terrestrial herbaceous ecosystem located in Drumbeg Provincial Park.

APPENDIX B

BC CONSERVATION DATA CENTRE (BC CDC) ECOSYSTEMS EXPLORER SEARCH RESULTS

(//www2.gov.bc.ca/)

BC Species & Ecosystems Explorer

Modify Search (/pub/eswp/search.do?method=change) | New Search (/pub/eswp/search.do?method=reset) | Print (/pub/eswp/results_print.do)

Export Results | Help

Search Results 30 records

Show 50 rows | Column Visibility | Sort Order

Scientific Name

Ascending

Scientific Name	English Name	BC List	COSEWIC	SARA
Accipiter atricapillus laingi (/pub/eswp/reports.do?elcode=ABNKC12062)	American Goshawk, *laingi* subspecies	Red	T	1-T (2003)
Aplodontia rufa (/pub/eswp/reports.do?elcode=AMAFA01010)	Mountain Beaver	Blue	SC	1-SC (2003)
Buteo swainsoni (/pub/eswp/reports.do?elcode=ABNKC19070)	Swainson's Hawk	Red		
Cardellina canadensis (/pub/eswp/reports.do?elcode=ABPBX16030)	Canada Warbler	Blue	SC	1-T (2010)
Cercyonis pegala incana (/pub/eswp/reports.do?elcode=IILEPN701G)	Common Wood-nymph, *incana* subspecies	Red		
Chordeiles minor (/pub/eswp/reports.do?elcode=ABNTA02020)	Common Nighthawk	Blue	SC	1-SC (2023)
Claytonia washingtoniana (/pub/eswp/reports.do?elcode=PDPOR030U0)	Washington springbeauty	Blue		
Coenonympha california insulana (/pub/eswp/reports.do?elcode=IILEPN6038)	Common Ringlet, *insulana* subspecies	Red		
Contia tenuis (/pub/eswp/reports.do?elcode=ARADB09010)	Common Sharp-tailed Snake	Red	E/T	1-E (2003)
Corynorhinus townsendii (/pub/eswp/reports.do?elcode=AMACC08010)	Townsend's Big-eared Bat	Blue		
Dryopteris arguta (/pub/eswp/reports.do?elcode=PPDRY0A020)	coastal wood fern	Blue	SC	1-SC (2003)
Epilobium torreyi (/pub/eswp/reports.do?elcode=PDONA01050)	brook spike-primrose	Red	E	1-E (2007)
Eurybia radulina (/pub/eswp/reports.do?elcode=PDASTEB0K0)	rough-leaved aster	Red	T	
Glaucidium gnoma swarthi (/pub/eswp/reports.do?elcode=ABNSB08015)	Northern Pygmy-Owl, *swarthi* subspecies	Blue		
Lepus americanus washingtonii (/pub/eswp/reports.do?elcode=AMAEB03014)	Snowshoe Hare, *washingtonii* subspecies	Red		
Lomatium papilioniferum (/pub/eswp/reports.do?elcode=PDAPI1B2V0)	butterfly bearing lomatium	Red	T	1-T (2011)
Megascops kennicottii kennicottii (/pub/eswp/reports.do?elcode=ABNSB01042)	Western Screech-Owl, *kennicottii* subspecies	Blue	T	1-T (2005)
Melanerpes lewis (/pub/eswp/reports.do?elcode=ABNYF04010)	Lewis's Woodpecker	Blue	T	1-T (2012)
Mustela richardsonii anguinae (/pub/eswp/reports.do?elcode=AMAJF02014)	Ermine, *anguinae* subspecies	Blue		
Myotis lucifugus (/pub/eswp/reports.do?elcode=AMACC01010)	Little Brown Myotis	Blue	E	1-E (2014)

Scientific Name	English Name	BC List	COSEWIC	SARA
Neogale frenata altifrontalis (/pub/eswp/reports.do?elcode=AMAJF02034)	Long-tailed weasel, *altifrontalis* subspecies	Red		
Oreamnos americanus (/pub/eswp/reports.do?elcode=AMALE02010)	Mountain Goat	Blue		
Plagiobothrys tenellus (/pub/eswp/reports.do?elcode=PDBOR0V130)	slender popcornflower	Red	T	1-T (2011)
Platanthera ephemerantha (/pub/eswp/reports.do?elcode=PMORC1X050)	white-lip rein orchid	Blue		
Pristiloma johnsoni (/pub/eswp/reports.do?elcode=IMGAS80050)	Broadwhorl Tightcoil	Blue		
Progne subis (/pub/eswp/reports.do?elcode=ABPAU01010)	Purple Martin	Blue		
Sabulina pusilla (/pub/eswp/reports.do?elcode=PDCAR0G0Q2)	dwarf sandwort	Red	E	1-E (2005)
Tonella tenella (/pub/eswp/reports.do?elcode=PDSCR1Y020)	small-flowered tonella	Blue	E	1-E (2005)
Triteleia howellii (/pub/eswp/reports.do?elcode=PMLIL21061)	Howell's triteleia	Red	E	1-E (2005)
Uropappus lindleyi (/pub/eswp/reports.do?elcode=PDAST6E0B0)	Lindley's microseris	Red	E	1-E (2010)

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Search Criteria

Plants OR Animals
AND BC Conservation Status:Red (Extirpated, Endangered, or Threatened) OR Blue (Special Concern)
AND 'Local Trust Areas':Gabriola Island Local Trust Area
AND Habitat Subtypes: Conifer Forest - Dry
AND BGC Zone, Subzone: CDFmm
Sort Order:Scientific Name Ascending

Notes

1. Citation: B.C. Conservation Data Centre. 2024. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: https://a100.gov.bc.ca/pub/eswp/ (https://a100.gov.bc.ca/pub/eswp/) (accessed Oct 21, 2024).

2. The data contained in the Results Export in BCSEE are provided under the Open Government License - BC (http://www.data.gov.bc.ca/local/dbc/docs/license/OGL-vbc2.0.pdf).

3. We welcome your comments at cdcdata@gov.bc.ca.