SEM / TEM MAPPING UPDATES

Cultivated Fields on Gabriola Island & Coastal Sand Ecosystems In the Islands Trust Area

FOR:

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1 Introduction

Madrone Environmental Services Ltd. (Madrone) was retained by Islands Trust to conduct updates to the existing ecosystem mapping to inform future regional conservation planning and land use planning. Madrone proposed this work to be completed in two stages: (1) Project Initiation / Data Review, and (2) Ecosystem Mapping Updates. This report documents the results of stage one, which included the following tasks:

- Data Compilation and Background Review
- Review of ecosystem polygons on Gabriola Island that are currently classified as 'cultivated field', and to identify any natural herbaceous meadows (BC MOE 2006) occurring within them.
- Review of coastal sand ecosystem polygons to ensure they have been correctly interpreted (with reference to the 2011 "Status Report on Coastal Sand Ecosystems in British Columbia"), correct them if necessary, and propose a mechanism to identify these ecosystems within the Islands Trust area. Specifically, to assess the accuracy of polygon ID 1185 on North Thormanby Island.

Stage 2 will involve: (1) the extraction of sensitive ecosystem components from mixed polygons (those with both sensitive and non-sensitive components), and (2) conduct an update of the ecosystem mapping data to reflect recent disturbances to natural ecosystems, using 2014 ortho-imagery. Stage 2 will be completed by September 6, 2017.

The following report details the methods and results of Stage 1.

2 Methods

2.1 Data Compilation and Background Review

The following data and background information was compiled and reviewed:

- Terrestrial ecosystem mapping (TEM) and sensitive ecosystem mapping (SEM) data for the Islands Trust area.
- 2014 Orthophotos for Gabriola Island.
- 2011 Status Report on Coastal Sand Ecosystems in British Columbia.

2.2 Cultivated Fields on Gabriola Island

It had come to the attention of Islands Trust from site visits that some of the TEM polygons with the map code 'CF' representing 'cultivated field' were in fact shallow moss and herb ecosystems over bedrock (BC MOE 2006). Our evaluation of all 'CF' polygons on Gabriola Island involved a desktop interpretation and prioritization of field verification sites, followed by a field assessment and update of the attributes of the mapped features.

The 'CF' polygons were assessed one at a time, using 2014 high resolution ortho-imagery and 2m base map contours. Each polygon was assessed for the likelihood of natural herbaceous meadow occurring within it (disturbed or undisturbed), and those with potential were selected for field verification. Natural herbaceous meadows naturally occur on sites with thin, dry soils over shallow bedrock, and often on south-facing slopes. They are less likely to occur in depressions or moisture-receiving sites. Cultivated fields surrounded by closed canopy mature conifer forest with no conspicuous changes in topography were considered to be cleared forest, and not likely to have supported natural herbaceous meadow prior to cultivation.

Of the 77 polygons with a 'CF' component, 33 were selected for field verification. The field assessment was conducted on March 8, 2017 by Harry Williams and Ian Wright. Field observations were made from publicly accessible areas adjacent to the subject properties (usually the road), which limited field verification to 27 of the selected polygons. Without access to the sites, our assessment was limited to a visual inspection, sometimes at a distance. Binoculars were used to view sites that were far from the road.

Georeferenced photos and field observations were recorded with the Avenza PDF Maps iPad application. Field observation points were imported as a shapefile into ArcMap to cross-reference with the Islands Trust TEM/SEM layer, and polygon attributes were updated accordingly.

2.3 Coastal Sand Ecosystems

The 2011 "Status Report on Coastal Sand Ecosystems in British Columbia" was reviewed to identify any references to coastal sand ecosystems within the Islands Trust Area. We also reviewed the definitions of the various components of coastal sand ecosystems in reference to the available TEM and SEM map codes to evaluate whether the current classification systems were able to properly represent these ecosystems. Where appropriate classes or map codes were unavailable, we developed new ones so that locating and identifying coastal sand ecosystems in the Islands Trust area will be quick and simple.

The TEM/SEM attributes and linework were then updated to reflect the information provided in the status report. Ortho-imagery was used to guide the linework updates, which included the editing of existing features and the creation of new features as necessary to capture the current extent and type of coastal sand ecosystem. Orthophotos from 2014 were available for Denman and Hornby Islands. For the remaining areas, Esri basemap imagery was used.

3 Results

3.1 Cultivated Fields on Gabriola Island

One cultivated field polygon was confirmed to contain a natural herbaceous meadow component, as a result of the field assessment (Figure 1). Another potential site was identified by orthophoto interpretation but was not accessible for field verification (Figure 2).

Figure 1. Field verification site with confirmed herbaceous meadow on shallow soils over bedrock, covering approximately 20% of the polygon (OBJECTID 15217, ECP_TAG 092G011_50035)

Figure 2. Possible herbaceous meadow on shallow soils over bedrock (outlined green), identified through orthophoto interpretation but not accessible for field verification (OBJECTID 15212, ECP_TAG 092G011_50478 [green], within the original encompassing polygon OBJECTID 1785 [red])

Twenty-four polygons were partially or entirely classified incorrectly as cultivated field, which were most often updated to 'Rural', capturing land uses including rural residential, agricultural buildings, schools and playing fields. See the table in Appendix B for a complete list of the assessed cultivated field polygons and their attributes before and after the update.

A general observation from the field assessment was that despite the abundance of sites with shallow soils over bedrock and southern aspects, large natural herbaceous meadows appear to be quite rare on Gabriola Island. Most of the candidate sites were interpreted as being previously forested, and some likely included a component of previously fire-maintained Garry oak meadows. Another general observation was that the natural herbaceous meadow ecosystems that were observed (mostly outside CF polygons) were quite small and occurred as isolated patches in the surrounding forest (or cleared forest). This makes them relatively difficult to identify within a cleared and cultivated landscape, and difficult to confirm without a closer field inspection. We also observed that closed canopy forests commonly occurred on thin soils over rock – albeit with relatively slow growing trees and open understories.

3.2 Coastal Sand Ecosystems

Coastal sand ecosystems include beaches, dunes, spits, bars and feeder bluffs, as well as the salt marshes that form on the leeward side of spits. *Note that a spit may be comprised of dune, beach and bar components.* These ecosystems could be thought of as "sand-delivery systems": where eroding sand bluffs provide the sand, and, from the feeder bluffs, sand is transported along beaches, stored in bars, and later deposited to form spits and dunes. Coastal sand ecosystems depend on this movement of sand from the source to the deposition area. In the Islands Trust area, the distance between the source and deposition areas can be up to several kilometres (e.g. Sidney or Denman Islands). If either the erosion or transport processes are interrupted, by the stabilization of bluffs or hard-engineering of shorelines, spits and dunes may experience a net loss of sand and recede. As such, it is important to recognize coastal sand ecosystems as a dynamic system of erosion, sediment transport and deposition; a single component, such as dunes, should not be thought of in isolation.

Another consideration is that many of the coastal sand ecosystems in the Georgia Basin are remnant stabilized dunes, and active windblown dunes are rare. Remnant stabilized dunes may be shrub or tree-dominated, and form distinct vegetation communities. Although these may not be actively accreting or shifting, they still represent an important sensitive ecosystem type.
Coastal sand ecosystems within the Islands Trust area were identified in the 2011 status report as follows:

Table 1. Islands Trust coastal sand ecosystems identified in the 2011 Status Report.

James Island	South end bluffs Powder Dock/Jetty	West Spit North Spit
Sidney Island	Spit	
Penelakut (Kuper) Island	Penelakut Spit (Actually Crown/IR, not Islands Trust)	
Hornby Island	Tribune Bay	Whaling Station Bay
Denman Island	West Komas Bluff Sandy Island	Fillongley Park Longbeak Point
Thormanby Island	Vaucroft Beach Gill Beach	Buccaneer Bay

Coastal sand ecosystems, as described in the 2011 status report, are not adequately represented by either TEM or SEM standard map codes. The only applicable SEM code is HB:du for Herbaceous:dune ecosystems. For one, this is limiting because not all dunes are dominated by herbaceous vegetation (remnant stabilized dunes). Another issue with SEM classification is the lack of classes to capture the other components of coastal sand ecosystems (feeder bluffs, beaches, subtidal bars and spits). Some salt marshes associated with spits were classified as Wetland:marsh (WN:ms), the same code applied to freshwater marshes. Given the distinct nature of salt marshes in comparison to fresh water marshes, it is preferable to have a unique map code for them.

Relevant TEM classes included Beach (BE), Dunegrass – Beach pea (LM) and Nootka Rose – Pacific Crab Apple (RA). Several of the salt marsh sites were originally classified using the estuary site associations from MacKenzie and Moran (2004). Standard map codes are currently unavailable for the following documented plant communities associated with coastal sand ecosystems in the Islands Trust area:

- Dune wildrye – coastal strawberry
- Large-headed sedge (Red listed)
- Scotch broom – sweet vernal grass
- European beachgrass
- Pacific wormwood – red fescue (Red listed)

Remnant stabilized dunes are also commonly vegetated with trees including Douglas-fir and shore pine.

Compared to forests and rangelands, vegetation communities in coastal sand ecosystems have been poorly studied and a comprehensive classification system does not currently exist. Even if there were TEM map codes established for the above plant communities, another limitation of applying TEM classification to coastal sand ecosystems in a desktop

mapping context is that it is generally not possible to differentiate between types of sparse herbaceous plant communities using orthoimagery. Field work would be necessary to classify dune vegetation to the site series/association level.

To overcome these limitations, we developed a new set of SEM and TEM map codes to better represent coastal sand ecosystems. These new map codes are compatible with the existing SEM and TEM map code systems. They may be refined in the future, but we believe these new map codes provide a more complete representation of these ecosystems than the existing map codes would allow. We applied the new map codes in our updates to the coastal sand ecosystem polygons in the Islands Trust TEM/SEM spatial dataset. The new map codes are as follows:

Table 2. Newly developed SEM and TEM mapcodes to represent coastal sand ecosystems

Sensitive Ecosystem Map Code	Description	TEM Map Code for Sparsely Vegetated Areas	Description
SE:du	Sand ecosystem:dune	SE	Structural stages were used to differentiate dominant plant type (herb, shrub, tree)
SE:bl	Sand ecosystem:bluff		
SE:ba	Sand ecosystem:bar		
SE:bb	Sand ecosystem:beach		
SE:sp	Sand ecosystem:spit		
SE:sm	Sand ecosystem:salt marsh		

Descriptions of estuarine site associations (part of the TEM classification) that were originally applied to the salt marsh polygons were not changed, as the dominant plant species may have been confirmed through past field observations. However, the TEM map code for salt marshes associated with coastal sand ecosystems was changed to SE to distinguish them from estuarine sites. The main shortcoming of the new TEM mapcode is that it is not specific to the type of coastal sand ecosystem or the plant community site association, only providing structural stage in addition to the 'SE' mapcode. As such, the information provided by the TEM code is limited and could likely be improved in the future. In this way, the new map codes for coastal sand ecosystems are provided as an improvement to the existing classification systems, but they are also a work-in-progress. Attributes and linework were updated for all of the above coastal sand ecosystems identified in the 2011 status report, using our newly developed map codes. Additionally, we assessed and updated all polygons in the Islands Trust area with the SEM label HB:du. Figure 3 illustrates how the representation of coastal sand ecosystems was improved by this mapping update, using James and Sidney Islands as examples. The second table in Appendix B includes all of the updated feature attributes, before and after the update.

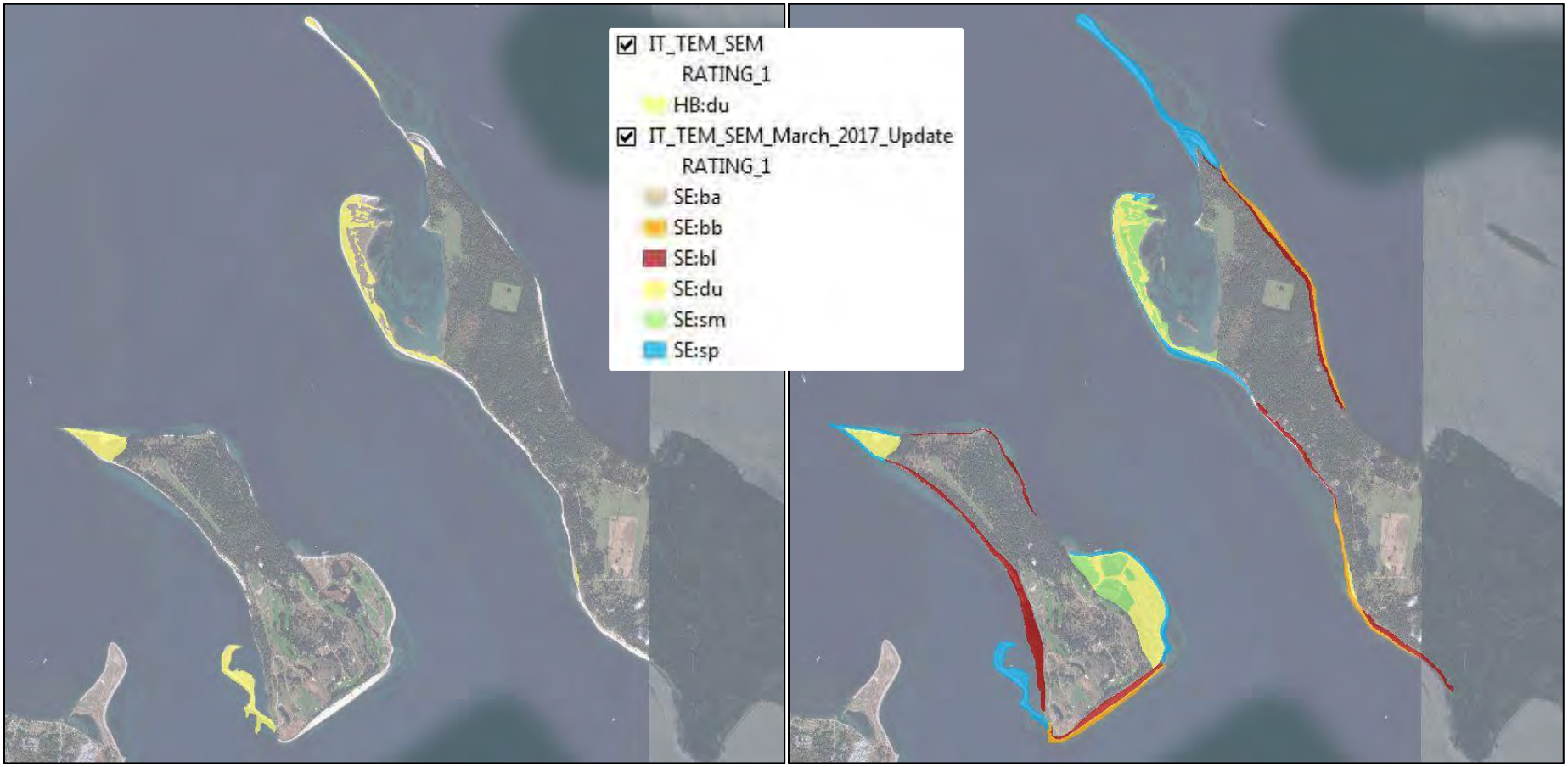


Figure 3. Originally mapped herbaceous dune (HB:du) ecosystems on James and Sidney Islands (left), in comparison to the updated mapping of coastal sand ecosystems (SE) including dune, bluff, beach, bar, spit and salt marsh (du, bl, bb, ba, sp and sm) components (right).

As specified in part 3 of the service contract, polygon ID 1185 (Vaucroft Beach on North Thormanby Island) was closely evaluated. The South Coast Conservation Program report, "*Coastal Sand Ecosystem Management Guidelines – North Thormanby Island, Sunshine Coast, BC*" provides a detailed description of the southern portion of this polygon (Baker, 2016). The report states that the coastal sand ecosystem area of interest is primarily to the south of the public dock. However, based on our orthophoto interpretation, the area north of the dock appears to be remnant stabilized dune with increasing tree cover moving northward. This could be confirmed by a field assessment. The table below details the SEM and TEM polygon attributes before and after our update:

Table 3. Update of Polygon ID 1185 – Vaucroft Beach on North Thormanby Island

Original SEM	Original TEM	Updated SEM	Updated TEM
50% MF:co Mature Forest:conifer	50% RC s 6 Western Redcedar – Grand fir - Foamflower	100% SE:du Sand ecosystem:dune	50% SE 2b
30% MF:co Mature Forest:conifer	30% DS s 6 Douglas-fir - Salal		30% SE 6
20% NA Not SEI	20% RW		20% RW

4 Discussion and Conclusions

4.1 Cultivated Fields on Gabriola Island

Based on our orthophoto interpretation and field verification (generally limited to a visual inspection of properties from public roads), natural herbaceous meadows having been incorrectly classified as cultivated fields appears to be a rare case on Gabriola Island. Of the 27 observed sites that were prioritized for field verification, natural herbaceous meadow was only observed on one site. One area on a 'CF' polygon was identified as a potential natural meadow through orthophoto interpretation, but was not accessible for field verification. As these natural herbaceous meadows on shallow soils over bedrock are relatively rare and occur in small patches, they are difficult to identify within a cleared and cultivated landscape. They are also difficult to confirm without a closer field inspection, which was not possible during this assessment.

Due to the access limitations, it is possible that some natural herbaceous meadow patches were missed on portions of the field verification sites that were far from the road. Without access to the sites, our assessment cannot be considered comprehensive; there may be additional sites with natural herbaceous meadows that we were unable to identify.

Note that we were specifically looking for herbaceous meadows that naturally develop due to very thin soils over bedrock, typically on dry sites with southern aspects. Garry oak meadows that were developed and maintained on deeper soils through First Nations management practices were outside the scope of this project. It may be the case that such Garry oak meadows existed on numerous sites currently identified as cultivated field on Gabriola Island, perhaps more commonly than thin soil meadows.

4.2 Coastal Sand Ecosystems

Coastal sand ecosystems are not adequately represented by current TEM and SEM standard map codes. To address this issue, we developed a new set of map codes to describe these ecosystems in the Islands Trust area. We consider these new map codes to be a work-in-progress, which may evolve with further input. All of the coastal sand ecosystems identified in the 2011 status report were assessed, as well as all existing polygons with the SEM class HB:du, and the Islands Trust TEM/SEM spatial dataset was updated accordingly. Both attributes and linework were adjusted where necessary to properly represent these rare ecosystems. To select and view the updated sand ecosystem polygons in ArcMap, see the suggested method below.

Query the updated sand ecosystem polygons by entering the following SQL expression in the Select By Attributes dialogue box in ArcMap:

"RATING_1" LIKE 'SE%' OR "RATING_2" LIKE 'SE%' OR "RATING_3" LIKE 'SE%'

Or if a specific coastal sand ecosystem type is of interest, such as dunes, enter:

"RATING_1" = 'SE:du' OR "RATING_2" = 'SE:du' OR "RATING_3" = 'SE:du'

One of our observations during the update of coastal sand ecosystem features is that due to the relatively small size of these features in the Georgia Basin, it is difficult to accurately map their various components (dune, beach, bar, etc.) at the landscape scales at which TEM and SEM mapping is usually conducted (>1:10,000). Much more detailed mapping of these features becomes possible at scales below 1:2,500. Another point is that it is often difficult to distinguish between different plant communities using orthophotos when assessing sparsely vegetated ecosystems, which often have herbaceous dominated plant communities. . In order to reliably identify specific plant communities, therefore, (upon which TEM classes are usually based) a field assessment would be required. To further improve the new map code system, we should consider developing TEM codes for the coastal sand ecosystem vegetation communities described in the 2011 Status Report. Given that the number of coastal sand ecosystems in the Islands Trust area is limited, and

that these sites are generally quite small (a reasonable size to complete field assessments in a day or two), mapping them on a finer scale with the support of field data may be the best way forward if the Islands Trust is interested in documenting these rare ecosystems in greater detail. An example of this is the detailed TEM mapping of the TIXEN/Cordova Shore by the BC Ministry of Environment (2008).

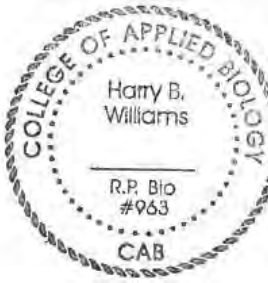
4.3 Summary

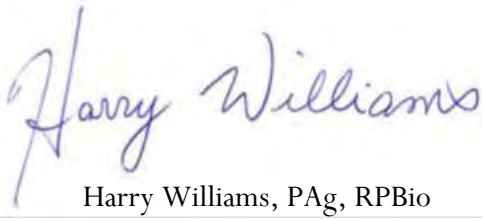
- Natural herbaceous meadow on shallow soil over bedrock was confirmed on a portion of one polygon that was originally mapped as cultivated field.
- Another potential site was identified through orthophoto interpretation, but was not accessible for field verification.
- New SEM and TEM map codes were developed to provide a complete representation of coastal sand ecosystems in the updated spatial dataset.
- All of the coastal sand ecosystems identified in the 2011 status report were assessed, as well as all existing polygons with the SEM class HB:du, and the Islands Trust TEM/SEM spatial dataset was updated accordingly.

5 Recommendations

- If the Islands Trust would like a more comprehensive assessment of natural herbaceous meadows on shallow soils over bedrock, permission to access private properties would be needed.
- If a development is proposed in areas with potential for herbaceous meadows it is important the local planners do a field assessment prior to disturbance. In many cases small herbaceous meadows may occur in small gaps within the forest canopy.
- TEM map codes should be developed for the vegetation communities described in the 2011 Status Report on Coastal Sand Ecosystems in BC.
- As coastal sand ecosystems are limited in size and distribution in the Islands Trust area, they are a good candidate for mapping at a finer scale with the support of field assessments. This would be useful if Islands Trust was interested in tracking changes in these ecosystems over time (i.e. expansion or contraction of dunes, spread of invasive plants, etc.).

Sincerely,
MADRONE ENVIRONMENTAL SERVICES LTD.





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APPENDIX A

Site photos

Photo 1: Example of a cultivated field with no shallow soil herbaceous meadow.
[FV2, OBJECTID 1897 & 1934, ECP_TAG 092G012_50379 & 50383]

Photo 2: Example of a confirmed cultivated field, also confirmed to be seasonally flooded.
[FV25, OBJECTID 2187 & 2169, ECP_TAG 092G011_50060 & 50058]

Photo 3: Example of a park (Twin Beaches) that had been incorrectly classified as a cultivated field.
[FV28, OBJECTID 2125, ECP_TAG 092G011_50023]

Photo 4: Natural herbaceous meadow with shallow and exposed bedrock, confirmed on a site that was originally classified as cultivated field.
[FV30, OBJECTID 15217, ECP_TAG 092G011_50035]

Photo 5: Rural residential area that had been incorrectly classified as a cultivated field.
[FV31, OBJECTID 2154, ECP_TAG 092G011_50045

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APPENDIX B

Summary Tables

The following summary table includes all of the cultivated field polygons that were assessed on Gabriola Island, either through orthophoto interpretation or field verification. Where attributes were changed from the original, they are highlighted in orange in the updated columns.

POLYGON ID		ORIGINAL SEM			UPDATED SEM			ORIGINAL TEM			UPDATED TEM			COMMENTS ON UPDATE
OBJECT ID	ECP_TAG	SEM Dec 1	SEM Dec 2	SEM Dec 3	SEM Dec 1	SEM Dec 2	SEM Dec 3	TEM Dec 1	TEM Dec 2	TEM Dec 3	TEM Dec 1	TEM Dec 2	TEM Dec 3	
2031	092G011_50257	10 FS			8 FS	2 RI		10 CF 2b			9 CF 2b	1 RW		CF and RW confirmed
1812	092G012_50424	9 FS	1 NA		9 NS	1 WD:mx		9 CF 2b	1 RW		8 CF 2b	1 RW	1 GO 5	CF confirmed. Small patches of mixed Garry oak woodland.
2115	092G011_50061	10 FS			10 NS			10 CF 2b			9 CF 2b	1 RW		CF correct. Not seasonally flooded.
2011	092G011_50160	7 FS	2 NA	1 NA	9 NS	1 WL:ms		7 CF 2b	2 DS 4	1 RW	5 RW	4 DS 4	1 Wm50	Confirmed rural
1867	092G012_50397	9 FS	1 NA		10 NS			9 CF 2b	1 RW		10 RW 2b			Confirmed RW. Not seasonally flooded.
1939	092G011_50284	5 FS	5 NA		10 NS			5 CF 2b	5 RW		10 RW 2b			RW.
15217	092G011_50035	10 FS			10 NS			10 CF 2b			10 GC 2b			Golf course, not seasonally flooded or CF
2073	92G11_50087	9 FS	1NA		8 NS	2 HB:hb		9 CF 2b	1RW		6 CF 2b	2 RW	2 QB 2b	Meadow component with mature GO trees on shallow soils and exposed bedrock
2186	092G011_50060	8 FS	1 NA	1 NA	10 NS			8 CF 2b	1 DS 3	1 RW	6 RW 2b	2 DS 3	2 CF 2b	Not accessible. Not seasonally flooded. RW, CF and young forest.
2248	092G012_51173	6 FS	3 NA	1 NA	10 NS			6 CF 2b	3 RW	1 DS 4	10 RW			Not CF. Forest component removed. Not seasonally flooded.
2141	092G011_50105	7 YF	2 NA	1 FS	7 YF	3 NA		7 DS 5	2 DS 4	1 CF 2b	7 DS 5	2 DS 4	1 RW	Not CF. Not seasonally flooded.
2161	092G011_50062	8 FS	2 WN:sp		4 NS	2 WN:sp	2 WN:ms	8 CF 2b	2 RP 3		4 CF 2b	3 Ws51 3a	3 Wm50 2b	Partly cultivated cleared forest and wetland.
1831	092G012_50404	5 NA	5 FS		10 NS			5 DS 4	5 CF 2b		5 DS 4	5 RW 2b		Not seasonally flooded and not CF.
1878	092G012_50349	9 FS	1 NA		10 NS			9 CF 2b	1 DS 4		5 RW 2b	4 GP	1 DS 4	Not seasonally flooded or CF. Not accessible but likely GP.
1877	092G012_50365	5 FS	5 FS		10 NS			5 CF 3a	5 CF 2b		5 DS 5a	5 CF 2b		Not seasonally flooded. Merged ECP_TAG 596 with 587.
1322	092G011_50096	8 FS	2NA		9 WD:bd	1 YF		8 CF 2b	2 RW		9 GO 3a	1 DS 5		Possible GO meadow - not field confirmed. Newly split polygon.
15212	092G012_50478	10 FS			10 NS			10 CF 2b			10 RW 2b			Rural - playing field, not CF
2101	092G011_50109	10 NA			9 NA	1 WD:mx		10 RW			5 RW	4 CF 2b	1 GO 5	RW confirmed. CF added. Small patches of mixed Garry oak woodland.
1811	092G012_50439	9 FS	1 MF:co		9 NS	1 MF:co		9 CF 2b	1 DS 6		9 RW 2b	1 DS 6		RW, not CF. Not seasonally flooded.
2088	092G011_50077	6 FS	4 NA		10 NS			6 CF 2b	4 RW		10 RW			School with field. Not seasonally flooded.
2118	092G011_50113	7 FS	3 FS					7 CF 2b	3 CF 3a					Merged with adjacent polygon
2178	092G011_50032	9 FS	1 NA					9 CF 2b	1 RW					Merged with adjacent polygon
2143	092G011_50143	7 FS	2 YF	1 NA	7 NS	3 YF		7 CF 2b	2 DS 5	1 RW	7 CF 2b	2 DS 5	1 RW	CF and RW, not seasonally flooded.
1834	092G012_50405	8 FS	2 NA		10 NS			8 CF 2b	2 RW		8 CF 2b	2 RW		CF confirmed. Not seasonally flooded.
2116	092G011_50059	10 FS			10 NS			10 CF 2b			10 CF 2b			CF correct. Not seasonally flooded.
2189	092G011_50075	9 FS	1 NA		9 NS			9 CF 2b	1 RW		9 CF 2b	1 RW		Confirmed. Not seasonally flooded.
2169	092G011_50058	10 FS			7 NS	3 FS		10 CF 2b			10 CF 2b			Not all seasonally flooded
2179	092G011_50010	8 FS	2 WN:sp		10 NS			8 CF 2b	2 RP 4		8 CF 2b	2 RP 4		Not seasonally flooded
1905	092G012_50317	8 FS	1 WN:sp	1 NA	8 NS	1 WN:sp	1 NA	8 CF 2b	1 RP 4	1 RW	8 CF 2b	1 RP 4	1 RW	Not seasonally flooded.
1971	092G012_50250	10 FS			10 NS			10 CF 2b			10 CF 2b			Not seasonally flooded.
1994	092G012_50237	10 FS			10 NS			10 CF 2b			10 CF 2b			Not seasonally flooded.
1996	092G012_50236	8 FS	2 NA		10 NS			8 CF 2b	2 RW		8 CF 2b	2 RW		Not seasonally flooded.
1795	092G012_50468	4 WN:sp	4 WN:sp	2 FS	4 YF	4 WN:sp	2 NS	4 RV 5	4 RV 4	2 CF 2b	4 RV 5	4 RV 4	2 CF 2b	TEM verified. SEI updated.
1941	092G012_50328	6 FS	3 WN:sp	1 NA	6 FS	3 WN:sp	1 NA	6 CF 2b	3 RP 3	1 ES 1	6 CF 2b	2 RP 3	2 GP 1	Aggregate mining N end. Likely not seasonally flooded but not field verified.
1888	092G011_50348	5 YF	5 FS		5 YF	5 FS		5 DS 5	5 CF 2b		5 DS 5	5 RW		CF changed to RW
2192	092G012_51146	5 YF	4 FS	1 NA	5 YF	4 FS	1 NA	5 DS 5	4 CF 2b	1 ES 1	5 DS 5	4 RW	1 ES 1	CF changed to RW
1985	092G011_50169	5 MF:co	4 NA	1 FS	5 MF:co	4 NA	1 FS	5 DS 6	4 RW	1 CF 2b	5 DS 6	5 RW		CF changed to RW.
2131	092G011_50120	7 NA	3 FS		7 NA	3 FS		7 DS 3	3 CF 2b		5 DS 3	3 RW	2 Ws50 3a	Changed from CF to RW
1962	092G011_50306	9 YF	1 FS		9 YF	1 FS		9 DS 5	1 CF 2b		9 DS 5	1 GC 2b		Golf course, not CF
2182	092G011_50040	9 WN:sp	1 FS		9 WN:sp	1 FS		9 RV 5	1 CF 2b		10 RV 5			Mostly forested. Clearings not accessible. Not CF.
2158	092G011_50090	9 WN:sp	1 FS		9 WN:sp	1 FS		9 RP 4	1 CF 2b		10 RP 4			Mostly forested. Not CF. Likely not WL:sp, but not field verified.
2006	092G012_51174	10 FS			10 FS			10 CF 2b			1 CF 2b			Not accessible

2091	092G012_50154	9 FS	1 FS		9 FS	1 FS		9 CF 2b	1 CF 3b		7 RW	3 CF 2b		Not accessible.
2132	092G011_50140	6 YF	3 FS	1 NA	6 YF	3 FS	1 NA	6 DS 5	3 CF 2b	1 RW	6 DS 5	4 RW		Not CF.
2176	092G011_50004	6 YF	3 NA	1 FS	6 YF	3 NA	1 FS	6 DS 5	3 RW	1 CF 2b	6 DS 5	4 RW		Not CF.
2125	092G011_50023	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 BE 1		9 RW	1 BE 1		Twin Beaches Park. CF changed to RW.
4562	092G011_50178_2	8 FS	1 NA	1 WN:sp	8 FS	1 NA	1 WN:sp	8 CF 2b	1 RW	1 Ws5 3a	9 Ws5 3a	1 RW		Wetland, not CF
1785	092G012_50478	8 FS	2 NA		8 FS	2 NA		8 CF 2b	2 RW		8 CF 2b	2 RW		CF and RW confirmed. Not seasonally flooded.
1790	092G012_50490	10 FS			10 FS			10 CF 2b			10 CF 2b			CF and RW confirmed. Not seasonally flooded.
1963	092G011_50322	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 RW		9 CF 2b	1 RW		CF and RW correct.
1879	092G012_50309	6 FS	2 WN:sp	2 WN:sw	6 FS	2 WN:sp	2 WN:sw	6 CF 2b	2 RP 4	2 OW	6 CF 2b	2 RP 4	2 OW	CF and Wetland
1777	092G012_50461	8 FS	2 NA		8 FS	2 NA		8 CF 2b	2 RE		8 CF 2b	2 RE		CF confirmed. Not seasonally flooded.
1778	092G012_50505	10 FS			10 FS			10 CF 2b			10 CF 2b			CF confirmed. Not seasonally flooded.
1781	092G012_50477	7 FS	3 NA		7 FS	3 NA		7 CF 2b	3 RW		7 CF 2b	3 RW		CF confirmed. Not seasonally flooded.
1840	092G012_50435	10 FS			10 FS			10 CF 2b			10 CF 2b			CF confirmed. Not seasonally flooded.
1853	092G012_50409	8 FS	1 WN:sp	1 NA	8 FS	1 WN:sp	1 NA	8 CF 2b	1 RV 3	1 RW	8 CF 2b	1 RV 3	1 RW	CF confirmed. Not seasonally flooded.
1897	092G012_50379	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 RW		9 CF 2b	1 RW		CF confirmed. Not seasonally flooded.
1934	092G012_50383	8 FS	2 FS		8 FS	2 FS		8 CF 2b	2 CF 3b		8 CF 2b	2 CF 3b		CF confirmed. Not seasonally flooded.
1973	092G012_50270	7 NA	3 FS		7 NA	3 FS		7 RW	3 CF 2b		7 RW	3 CF 2b		Confirmed
2022	092G012_50206	8 NA	2 FS		8 NA	2 FS		8 RW	2 CF 2b		8 RW	2 CF 2b		Confirmed
1861	092G012_50338	9 FS	1 WN:sp		9 FS	1 WN:sp		9 CF 2b	1 RP 3		9 CF 2b	1 RP 3		Confirmed.
1932	092G012_50274	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 RW		9 CF 2b	1 RW		Confirmed.
2003	092G012_50320	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 RW		9 CF 2b	1 RW		Confirmed.
2106	092G011_50141	5 NA	5 FS		5 NA	5 FS		5 RW	5 CF 2b		5 RW	5 CF 2b		Confirmed.
2188	092G011_50084	5 FS	3 FS	2 NA	5 FS	3 FS	2 NA	5 CF 2b	3 CF 3a	2 RW	5 CF 2b	3 CF 3a	2 RW	Confirmed.
1829	092G012_50492	8 FS	2 NA		8 FS	2 NA		8 CF 2b	2 RW		8 CF 2b	2 RW		Correct
2235	092G011_51148	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 RW		9 CF 2b	1 RW		Correct
1893	092G012_50290	6 FS	3 YF	1 NA	6 FS	3 YF	1 NA	6 CF 2b	3 DS 5	1 RW	6 CF 2b	3 DS 5	1 RW	Correct.
1948	092G012_50260	8 FS	2 NA		8 FS	2 NA		8 CF 2b	2 RW		8 CF 2b	2 RW		Correct.
2015	092G012_50217	6 FS	4 YF		6 FS	4 YF		6 CF 2b	4 DS 5		6 CF 2b	4 DS 5		Correct.
2172	092G011_50080	6 YF	3 FS	1 NA	6 YF	3 FS	1 NA	6 DS 5	3 CF 2b	1 RW	6 DS 5	3 CF 2b	1 RW	Correct.
2187	092G011_50067	10 FS			10 FS			10 CF 2b			10 CF 2b			Correct.
1944	092G012_50258	9 FS	1 NA		9 FS	1 NA		9 CF 2b	1 RW		9 CF 2b	1 RW		Not accessible
1952	092G012_50293	8 FS	2 FS		8 FS	2 FS		8 CF 2b	2 CF 3b		8 CF 2b	2 CF 3b		Not accessible
1894	092G012_50289	7 FS	2 WN:sp	1 WN:sp	7 FS	2 WN:sp	1 WN:sp	7 CF 2b	2 RP 5	1 RP 3	7 CF 2b	2 RP 5	1 RP 3	Not accessible.
1998	092G012_50267	10 FS			10 FS			10 CF 2b			10 CF 2b			Not accessible.
2000	092G012_50261	8 FS	2 NA		8 FS	2 NA		8 CF 2b	2 RW		8 CF 2b	2 RW		Not accessible.
2154	092G011_50045	6 FS	4 NA		6 FS	4 NA		6 CF 2b	4 RW		6 CF 2b	4 RW		Not accessible.
2159	092G011_50124	8 FS	2 YF		8 FS	2 YF		8 CF 2b	2 DS 5		8 CF 2b	2 DS 5		Not accessible.
1776	092G012_50504	7 FS	3 NA		7 FS	3 NA		7 CF 2b	3 RW		7 CF 2b	3 RW		Site not accessible. Likely RW and CF.

The following summary table includes the original and updated attributes of all coastal sand ecosystem polygons in the Islands Trust Area.

POLYGON ID		ORIGINAL SEM			UPDATED SEM			ORIGINAL TEM			UPDATED TEM			ISLAND
OBJECTID	ECP_TAG	SEM Dec 1	SEM Dec 2	SEM Dec 3	SEM Dec 1	SEM Dec 2	SEM Dec 3	TEM Dec 1	TEM Dec 2	TEM Dec 3	TEM Dec 1	TEM Dec 2	TEM Dec 3	
76	092G041_7164	5 NA	4 FS	1 NA	6 SE:du	4 SE:sm		5 BE 1	4 CF 2b	1 RW	5 SE 2g	4 SE 2b	1 RW	South Thormanby Island
102	092B064_33004	8 HB:du	2 HB:du		10 SE:du			8 LM 2b	2 RA 3b		8 LM 2b	2 RA 3b		James Island
103	092B064_33005	7 HB:du	3 HB:cs		10 SE:du			7 RA 3a	3 FC 2b		7 RA 3a	3 FC 2b		James Island
133	092B054_33551	8 HB:du	1 NA	1 NA	10 SE:sp			8 LM 2b	1 RZ	1 RW	8 LM 2b	2 SE 1a		James Island
134	092B054_33553	8 NA	2 HB:du		10 SE:bl			8 ES 1	2 RA 3b		10 SE 1			James Island
135	092B054_33552	10 YF			10 SE:bl			10 RF 5			5 SE 1a	5 SE 5		James Island
136	092B064_33554	4 NA	3 NA	3 FW:pd	10 SE:sp			4 GC 2b	3 GC 3	3 PD	4 SE 2b	4 SE 3a	2 SE:bb 1a	James Island
255	092F057_4188	7 NA	3 NA		10 SE:du			7 RW	3 BE 1		6 RW	4 LM 2b		Denman Island
360	092F066_4000	8 YF	2 NA		10 SE:bl			8 DS 5	2 DS 3		7 SE 5	3 SE 3		Denman Island
409	092F057_4358_2	5 NA	5 YF		10 SE:du			5 RW	5 DS 5		5 SE	5 SE 5		Hornby Island
484	092F057_4315	10 NA			10 SE:du			10 BE 1			6 LM 2b	4 PN 3b		Hornby Island
587	092F066_4002	6 NA	4 HB:du		10 SE:du			6 BE 1	4 LM 2b		7 SE 1	3 LM 2b		Denman Island
588	092F066_4493	10 YF			10 SE:du			10 DS 5			10 SE 5			Sandy Island
589	092F066_4492	10 HB:du			10 SE:bb			10 LM 2b			8 SE 1	2 LM 2b		Sandy Island
599	092F057_4486	10 NA			10 SE:bb			10 BE 1			10 SE 1			Hornby Island
603	092F057_4487	10 NA			10 SE:du			10 BE 1			6 RW 1	4 LM 2b		Hornby Island
933	092F059_6054	5 FS	3 WN:fn	2 WN:sp	10 SE:sm			5 CF 2b	3 Wf51 2b	2 RP 3	10 SE 2b			Lasqueti Island
1182	092F050_7129	6 CL:cc	4 MF:co		10 SE:bl			6 CL 1	4 RF 6		6 SE 1	4 SE 6		North Thormanby Island
1185	092G051_7113	6 FS	4 NA		10 SE:du			6 CF 2b	4 RW		5 SE 2b	3 SE 6	2 RW	North Thormanby Island
1222	092F060_7112	5 CL:cc	5 WD:co		10 SE:bl			5 CL 1	5 DA 5		7 SE 1	3 SE 5		North Thormanby Island
1250	092B092_51004	8 NA	2 WN:ms		7 SE:du	3 SE:sm		8 RZ	2 Em03 2b		7 LM 2b	3 SE 2b		Penelakut (Kuper) Island
1375	092B092_50979	5 FW:pd	3 WN:ms	2 HB:du	5 FW:pd	3 WN:ms	2 SE:du	5 PD	3 Em03 2b	2 RA 3	5 PD	3 Em03 2b	2 RA 3b	Thetis Island
1516	092G002_50785	10 HB:du			10 SE:du			10 RA 3b			10 RA 3b			Valdes Island
1525	092G002_50791	8 HB:du	2 NA		10 SE:du			8 LM 2b	2 BE 1		10 LM 2b			Valdes Island
2367	092B083_5328	6 NA	2 WN:ms	2 HB:du	6 NA	2 WN:ms	2 SE:du	6 RF 4	2 Em03 2b	2 RA 3	6 RF 4	2 Em03 2b	2 SE 3b	Galiano Island
2387	092B083_5335	6 HB:du	4 NA		10 SE:du			6 LM 2b	4 BE 1		10 LM 2b			Galiano Island
2738	092B083_5378	10 HB:du			10 SE:du			10 LM 2b			10 LM 2b			Parker Island
4561	092F057_4358_1	8 NA	2 HB:du		10 SE:sp			8 BE 1a	2 LM 2b		8 SE 1a	2 LM 2b		Hornby Island
4572	092B064_701	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Sidney Island
4702	092B064_99	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Sidney Island
4713	092B064_114	8 RI:ff	2 YF		10 SE:bl			8 CB 1	2 DG 5		6 SE 1	4 SE 5		Sidney Island

4725	092B064_126	9 NA	1 HB:du		10 SE:sp			9 BE 1	1 LM 2		9 SE 1	1 LM 2		Sidney Island
4857	092B064_217	10 WN:ms			10 SE:sm			10 Em02 2			10 SE 2			Sidney Island
4881	092B064_247	10 RI:ff			10 SE:bl			10 CB 1			10 SE 1			Sidney Island
5104	092B064_516	7 HB:du	3 WN:ms		10 SE:du			7 LM 2	3 Em03 2		7 LM 2	3 Em03 2		Sidney Island
5108	092B064_520	10 WN:ms			10 SE:sm			10 Em02 2			10 SE 2			Sidney Island
5141	092B064_631	10 HB:du			10 SE:du			10 LM 2			10 LM 2			Sidney Island
5152	092B064_551	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Sidney Island
5263	092B074_682	8 HB:du	2 NA		10 SE:du			8 LM 2	2 BE 1		8 LM 2b	2 SE 3b		Portland Island
5347	092B064_759	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Unidentified
5356	092B064_772	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Sidney Island
5377	092B064_793	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Sidney Island
5502	092B064_1077	10 HB:du			10 SE:du			10 LM 3			10 LM 3			Sidney Island
5520	092B054_910	10 HB:du			10 SE:du			10 LM 2			10 LM 2			D'Arcy Island
5578	092B064_951	7 HB:du	3 HB:sh		10 SE:du			7 LM 2	3 OR 3		8 LM 2	2 OR 3		Comet Island
5668	092B054_1075	10 RI:ff			10 SE:bl			10 CB 1			10 SE 1			Sidney Island
5673	092B064_1082	10 HB:du			10 SE:du			10 LM 2			10 LM 2			Sidney Island
8902	092B074_4109	6 HB:du	4 NA		10 SE:bb			6 LM 2	4 BE 1		8 SE 1	2 LM 2b		North Pender Island
9651	092B074_4866	10 NA			10 SE:du			10 DS 3			10 RA 3b			North Pender Island
10225	092B074_5440	7 HB:du	3 NA		10 SE:du			7 LM 2	3 BE 1		7 LM 2b	3 SE 1		South Pender Island
10280	092B074_5499	10 WN:ms			10 SE:sm			10 Em02 2			10 SE 2c			South Pender Island
11286	092B075_6746	10 HB:du			10 SE:du			10 LM 2			10 LM 2			Tumbo Island
11291	092B075_6739	10 NA			10 SE:bb			10 BE 1			10 SE 1			Tumbo Island
11379	092B075_6815	9 WN:ms	1 FW:pd		10 SE:sm			9 Wm05 2	1 PD		7 SE 2c	3 PD		Tumbo Island
12623	092B075_8071	7 HB:du	3 NA		10 SE:du			7 LM 2	3 BE 1		10 LM 2b			Tumbo Island
15106	092B064_33622	10 NA			10 SE:ba			10 MU 1a			10 MU 1a			Unidentified
15138	092F066_4495	8 HB:du	2 NA		10 SE:du			8 LM 2	2 BE 1a		5 LM 2	5 SE 1a		Seal Islets
15139	092F066_4496	10 HB:du			10 SE:du			10 LM 2			10 LM 2			Seal Islets
15222	092B064_33554	4 NA	3 NA	3 FW:pd	10 SE:sm			4 GC 2b	3 GC 3	3 PD	10 SE 2c			James Island
15243	092F050_7129	6 CL:cc	4 MF:co		10 SE:bl			6 CL 1	4 RF 6		6 SE 1	4 SE 5		North Thormanby Island
15265	092B064_313	7 HB:du	3 NA		10 SE:sp			7 LM 2	3 BE 1		9 SE 2	1 SE 1		Sidney Island
15273	092B054_33553	8 NA	2 HB:du		10 SE:bb			8 ES 1	2 RA 3b		10 SE 1			James Island
15282	092B064_33004	8 HB:du	2 HB:du		10 SE:sp			8 LM 2b	2 RA 3b		8 SE 1	2 LM 2b		James Island
15285	092F050_6596	8 MF:co	2 WD:co		10 SE:du			8 DS 6	2 DA 6		6 SE 2a	4 RA 3b		Sangster Island
15291	092F050_6596	8 MF:co	2 WD:co		10 SE:bb			8 DS 6	2 DA 6		10 SE 1			Sangster Island
15303	092F066_4492	10 HB:du			10 SE:du			10 LM 2b			10 LM 2b			Sandy Island
15311	092F066_4496	10 HB:du			10 SE:bb			10 LM 2			8 SE 1	2 LM 2b		Seal Islets

15326	092F057_4358_1	8 NA	2 HB:du		10 SE:du			8 BE 1a	2 LM 2b		10 LM 2b			Hornby Island
15345	092B064_951	7 HB:du	3 HB:sh		10 SE:bb			7 LM 2	3 OR 3		7 SE 1	3 LM 2b		Comet Island
15349	092F059_6000	6 YF	4 NA		10 SE:du			6 DS 5	4 RW		10 LM 2b			Lasqueti Island
15372	092F057_4486	10 NA			10 SE:du			10 BE 1			6 LM 2b	4 RA 3b		Hornby Island
15386	092B092_51004	8 NA	2 WN:ms		10 SE:sm			8 RZ	2 Em03 2b		10 SE 2c			Penelakut (Kuper) Island
15390	092B092_51004	8 NA	2 WN:ms		10 SE:sp			8 RZ	2 Em03 2b		8 SE 1	2 LM 2b		Penelakut (Kuper) Island
15230					10 SE:bb						10 SE 1			
15253					10 SE:sp						5 SE 1	3 SE 5	2 SE 3	
15260					10 SE:bb						10 SE 1			
15261					10 SE:ba						10 SE 1a			
15269					10 SE:bb						10 SE 1			
15271					10 SE:bb						10 SE 1			
15277					10 SE:bl						10 SE 2a			
15295					10 SE:bb						10 SE 1			
15314					10 SE:sp						10 SE 1			
15316					8 SE:du	2 NA					8 SE 1	2 GP 1		
15318					10 SE:sp						8 SE 1	2 LM 2b		
15329					10 SE:bb						8 SE 1	2 LM 2b		
15342					10 SE:bb						8 SE 1	2 LM		
15348					10 SE:bb						8 SE 1	2 LM 2b		
15351					10 SE:sp						10 SE 1			
15357					10 SE:du						10 LM 2b			
15358					10 SE:bb						8 SE 1	2 LM 2b		
15363					10 SE:bb						10 SE 1			
15371					10 SE:bb						10 SE 1			
15382					10 SE:bb						10 SE 1			
15384					6 SE:bb	4 SE:du					6 SE 1	4 SE 2b		

* Note that newly digitized polygons have not been assigned an ECP_TAG ID at this point. Unique polygon IDs and ECP_TAGs will be updated during Stage 2 of the project.